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Volume 6

Language Structure and Environment. Social, cultural, and natural factors
Edited by Rik De Busser and Randy J. LaPolla

Language Structure and Environment

Social, cultural, and natural factors

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The influence of social, cultural, and natural factors on language structure

An overview

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This book is an attempt to give an overview of how language interacts with its environment, or better, how actual linguistic structure is formed, changed and influenced by different aspects of the human environment. The focus is mainly on effects of the extra-linguistic environment on the actual grammatical structure of languages; we will leave influences on other linguistic subsystems such as phonology, the lexicon, and discourse structure to the efforts of other researchers.

The underlying assumption of this entire volume is that linguistic structure is not only shaped by how speakers interact with each other and with the world they live in, but also by external forces that are outside the control of individual speakers or speech communities. One might call it natural selection in grammar, were it not for the fact that it is not entirely clear whether biological and linguistic change operate along the same real-world principles, or whether any correspondences are much more superficial.

1. Introduction

The general idea set out in this book is that language structure is influenced by the environment in which it is used. This idea is not original in itself and, to some, might appear trivial. Indeed, as Gumperz & Levinson (1996:1) courageously remark at the very outset of an edited volume:

> Every student of language or society should be familiar with the essential idea of linguistic relativity, the idea that culture, *through* language, affects the way we think, especially perhaps our classification of the experienced world.

Putting aside directionality (language influencing culture or vice versa), two things are worth pointing out.

1.1   Non-autonomous syntax

First, if the idea of the extra-linguistic environment shaping linguistic structure were self-evident, one would expect it to have become more popular in linguistics. Instead, we find the following categorical statement in a work on generative phonology:

> There is no correlation whatsoever between phonological structure (or for that matter, any matter of linguistic structure) and the environment. […] Studying the structure of a language reveals absolutely nothing about either the people who speak it or the physical environment in which they live.   (Kaye, 1989, p. 48)

The idea is also diametrically opposed to what since the 1950s has been an influential tenet in linguistic theory, especially in the generative tradition, namely the autonomy of syntax. There are different interpretations of what this concept exactly means, but all imply that syntax is best explained in isolation from other linguistic subsystems, function and usage.[1] While this usually does not negate the importance of semantics or pragmatics in the understanding of language in general, it does imply that "a formal grammar can in principle be selected […] on the basis of a preliminary analysis of data in terms of formal primitives excluding the core notions of semantics" (Chomsky, 1977, p. 42). In other words, meaning, actual language use and the extra-linguistic context are inconsequential for an understanding of the grammatical structure of language.

As Croft (1995, pp. 490–491) points out, the autonomy of syntax is often seen as a consequence of that "undeniable fact of all languages", the Saussurian concept of the arbitrariness of the sign, which does indeed imply at the very least a certain degree of disconnect between linguistic form and its function within a non-linguistic context. However, the evolution of arbitrary form-function combinations does not exclude the existence of direct environmental pressure, either in language or in other communicative systems. To give one example, alarm calls in various monkey species all evolved in response to acute danger in the immediate environment, but their exact vocalizations are to a large extent random (for instance, there is no iconic relationship between the sound structure and the predator indicated).

One of the reasons why the idea of autonomous syntax is so attractive is undoubtedly because it prevents theoretical models from becoming too complicated: Chomsky (2002, pp. 52–53) implies as much in saying that it is unreasonable to demand from a grammar that it accurately represents language use in context, because this would lead "into a maze of more and more elaborate and complex analytic procedures that will fail to provide answers for many important questions

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1.   See e.g. the Autonomous Syntax Principle in (Radford, 2009, p. 31): "No syntactic rule can make reference to pragmatic, phonological, or semantic information."

about the nature of linguistic structure." This might explain why even in frameworks formulated in opposition to generative linguistic theory the non-linguistic context is often largely excluded from grammatical description and interpretation, not necessarily by axiomatic fiat, but certainly as a pervasive working assumption.

A good example is Croft (2003), a well-known and in many ways excellent introductory work to linguistic typology, which describes typology in opposition to generative theories of language as a functional approach to language, that is, a linguistic approach that espouses "the view that linguistic structure should be explained primarily in terms of linguistic function" (Croft, 2003, p. 2). Croft (2003, pp. 13–14) recognizes the importance of semantic and pragmatic factors in determining cross-linguistically valid grammatical categories, but extra-linguistic categories are not discussed at all, and the book focuses strongly on structural explanations of cross-linguistically valid grammatical patterns. There is nothing inherently wrong with this (any theory needs to limit its subject matter in certain ways); it merely illustrates that autonomous approaches to syntactic structure are not a phenomenon exclusive to generative grammar. Even in reactions against the idea of the autonomy of syntax, such as Anderson (2006), the term is usually interpreted in its original, narrow sense, namely the absence of theoretically relevant interactions between grammatical structure *and semantics or pragmatics*. The extra-linguistic environment itself is of no real concern in his discussion.

The studies in this book show that such views and attitudes are increasingly untenable: an ever-growing mountain of evidence suggests that there are plenty of complex interactions between language and its environment, and that in certain cases these interactions have a measurable influence on the development of grammatical structures. One of the first and foremost goals of this volume is to illustrate that it does not make sense to investigate the structure of a language in an artificially imposed isolation from the environmental factors that have a significant influence on its development and evolution. In other words, we will provide evidence here that grammar, and language in general, is non-autonomous.

1.2   Linguistic relativity

Secondly, the idea at the basis of this volume is compatible with that of linguistic relativity, but there are important differences. The concept of linguistic relativity was originally formulated by Whorf, but probably most eloquently expressed by Edward Sapir, who stated that "language does not exist apart from culture, that is, from the socially inherited assemblage of practices and beliefs that determines the texture of our lives" (Sapir, 1921, p. 221).

Many interpretations exist about the exact nature and scope of linguistic relativity; Gumperz & Levinson (1996c) and Lucy (1997) both provide excellent overviews of the historical development, and diverse interpretations of the concept.

Sidestepping a theoretical quagmire, we will here assume a so-called weak interpretation of linguistic relativity, which implies that culture exerts an influence on but does not fully determine linguistic structure, and further assume that the interaction between culture and language is bidirectional. It is debatable whether either of these assumptions was made by Whorf, and especially the latter will be contentious to at least a portion of linguists and anthropologists that are presently working on linguistic relativity.

Lucy (1997, p. 294), for instance, states that "[l]anguage embodies an interpretation of reality and language can influence thought about that reality" and that "[l]inguistic relativity proposals emphasize a distinctive role for language structure in interpreting experience and influencing thought." In contrast, the contributions to this volume are not interested in how language influences our experience of reality, but rather the opposite, how external reality leads to certain grammatical features. One could argue that some circularity is implied in linguistic relativity and that when language influences our perception of reality, this perceived reality in return suggests or implies certain restrictions on specific grammatical patterns. However, this is an observational implication and has little to do with real-world causality. We are here not merely interested in observed correlations between grammatical structure and reality without regard to causal direction; our aim is to investigate how external real-world factors can *trigger or influence* the development of certain grammatical features in a language.

During the last decades, the idea of linguistic relativity, with some modifications, was rediscovered by a number of linguistic subfields that study the interaction between culture, language and cognition, such as sociolinguistics, ecolinguistics and ethnosyntax (see *Related fields* below). Gumperz & Levinson (1996b, p. 9) also relate linguistic relativity to a broad interpretation of Peirce's concept of indexicality as the relationship between sign, communicative participants, and the communicative context.[2] This is what makes linguistic relativity relevant to understanding functional approaches to language, which in all their variety all start from the assumption "that the communicative situation motivates, constrains, explains, or otherwise determines grammatical structure" (Nichols, 1984, p. 97). Often, this communicative situation is interpreted narrowly in terms of communicative intent: linguistic structures are explained in terms of the needs or desires of speakers to communicate certain pieces of information in certain situations.

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2.   The traditional interpretation of indexicality is often narrow and only applies to deixis. On the other hand, Enfield (2004, pp. 10–11) talks of social indexicality as a creative force enforcing social identity and leading to grammatical innovation.

Though obviously relevant to the topic of this book, both interpretations of the extra-linguistic context are much more restrictive than how we defined it above. In the case of the original Sapir-Whorf hypothesis and its modern incarnations, this context is assumed to be human culture; in modern functional theories of language, it is the communicative setting and its influence on communicative intent. Both are subsumed in our definition of the extra-linguistic context, but our basic assumption will be that every single element in the extra-linguistic environment, be it cognitive, social, cultural, biological or physical, should be treated as a potential factor of influence on the structure of languages. Some of these factors might be consciously observed or even constructed by the speakers of these languages as communicative goals or as part of the socio-cultural setting, but others might be imperceptible to the language users, for instance because they exert their influence on evolutionary time scales or in an indirect fashion.

2. Related fields

In this section we will first set out to what extent the general idea behind this book, that grammatical structure is directly influenced by the extra-linguistic environment, is similar to or different from existing approaches to linguistics. Although the modern study of language in its environmental context goes back at least to Sapir's (1912) article, it was especially in the last half century that a number of subfields in linguistics, both small and not so small, have arisen that study various interactions of language and the non-linguistic environment. In terms of their research subjects, the boundaries between these disciplines are not always equally clear, but each started from its own distinct source and has its own unique point-of-view of how language should be analysed.

2.1 Functional grammar

The foundations for functional linguistics were laid in the Prague School of linguistics in the first half of the twentieth century. As Nichols (1984) points out, there is considerable variety in how the concept *function* is actually interpreted, but in general, functional (or functionalist) theories of language seek to explain the development and use of linguistic phenomena in terms of their socio-cultural and discursive function.

It is obvious that in such frameworks, any adequate explanation of grammatical structure needs to take into account the influence of the extra-linguistic context, although interpretations of the exact nature and scope of this context may vary. For instance, Dik (1987) has an instrumentalist view on language as a tool

"in the establishment of complex patterns of social interaction" (Dik, 1987, p. 83), realized through the interaction of syntax, semantics and pragmatics that can be encoded in a formal-logical model. On the other hand, in Halliday's Systemic-Functional Grammar, linguistic structure arises from environmentally imposed constraints on a speaker's creative potential and takes the form of "systematic relations […] between semantic system networks and behaviour patterns on the one hand and between semantic networks and the lexicogrammar on the other" (Davidse, 1987, pp. 47–49).

The two examples illustrate that in practice, many contemporary functionalist theories tend to focus on the interplay between semantic and pragmatic function on the one hand and grammatical structure on the other, abstracting away from the actual interaction between linguistic and non-linguistic information networks in favour of a system-internal, purely linguistic interpretation. As mentioned before, such approaches are generally compatible with the assumptions at the basis of the present volume, and some contributors to this volume would identify themselves as functionalist linguists.

However, relationships between language and the communicative context only form a small subset of the relationships between grammatical structure and the non-linguistic environment that we are interested in here. While generally compatible with the general tenets of functional linguistics, the contributions in this volume tend to emphasize the interactions between grammatical structure and the outside world, rather than intra-linguistic relationships between syntax and pragmatics (see LaPolla, this volume, for an in-depth discussion).

2.2   Sociolinguistics

Though relatively young – the term itself goes back to the work in the early 1960s (see Hymes, 1974, p. 193) – sociolinguistics is a relatively mature field, both in terms of the variety of its research matter and the amount of research published. Sociolinguistics studies the interactions between language and society. What this exactly pertains to is a subject of healthy debate. For Hymes (1974, pp. 195–197), there are "three main orientations": (1) attitudinal studies, investigating social attitudes toward certain linguistic phenomena (e.g. work on language standardization); (2) variational studies, investigating the influence of the social context on language variation (e.g. dialect; and (3) functional studies, investigating the social functions of linguistic expressions (e.g. discourse analysis). It is mainly the second strand that is of interest to us here, to the extent that it focuses on socially conditioned variation of grammar (rather than, for instance, phonology, a popular subject in some early studies). The influence of geo-social and societal factors on grammatical variation (dialectal or sociolectal) is discussed in the contributions in Section 2 of this book.

Some principles of sociolinguistics are of general relevance to the work presented in this volume, whether it is explicitly sociolinguistic in nature or not. All sociolinguists have an explicit interest in actual language use in context rather than the structuralist insistence on a fundamental separation between competence and performance. Labov (1972, p. xiii) goes as far as to say that it is simply not possible to investigate language outside its social context, a sentiment we here support unequivocally. It makes as little sense to study the abstract formal structure of a language in isolation from its context of use or from its developmental pathway as it does to do so with an abstract Mondriaan painting. A formal analysis of such artwork might record in excruciating detail the dimensions, position, and colour of each square, the materials of which it is made, and transformation rules that allow us to mathematically derive this particular painting from its predecessors, but this would be utterly meaningless. The work only gets meaning in its historical background (the abstract movement that evolved out of expressionism), the artistic evolution of the painter (from impressionism over cubism to strict non-representationalism), and its intended meaning in a particular social-artistic context (an expression of the abstract beauty of the laws of the universe; see Gombrich, 2006, p. 451, fig. 381).

Sociolinguistics has traditionally also had a strong interest in empirically grounded research, often with an experimental component. This type of research can be quantitative or qualitative, but in both cases it tends to derive results from verifiable and falsifiable data sets, unlike formalist theories of language, which traditionally are focused more on introspection.[3] A similar concern about the nature of evidence is reflected in most if not all contributions to this volume.

2.3 Ecolinguistics

Einar Haugen, credited in Fill & Mühlhäusler (2001) with founding ecolinguistics, defines the field as "the study of interactions between any given language and its environment" (Haugen, 2001, p. 57) and delineates this environment very specifically as human society. In this light, it is not entirely clear whether ecolinguistics should be considered a linguistic subdiscipline in its own right, or rather a particular attitude towards sociolinguistics.

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3. Even recently, when Featherston (2007, p. 272) pleaded for an increased use of empirical data in generative syntax and remarked that "a significant number of linguists are still, in spite of all the warnings to the contrary, using as the basis of their work what we might call linguist's judgements", Fanselow (2007, p. 354) responded that there are no sound methodological reasons that "would require the exclusion of linguists' judgments from syntax research."

Another problematic aspect of ecolinguistics is that the exact boundaries of its research subject are not entirely clear. Nicholas Ostler, whose popular monograph on the influence of empire building on the development of languages (Ostler, 2006), a topic squarely within the scope of ecolinguistics, expresses his reservations rather directly in a review of Fill & Mühlhäusler (2001)'s overview volume: "Ecolinguistics is not a discipline, and hardly even a subject, despite the bold claim of the editors" and "cannot be seen as any sort of probative or empirical science" because it is internally inconsistent. A more charitable interpretation would be that ecolinguistics is a highly diversified field with a small number of general topical trends. In his seminal article, Haugen put great importance on language variation and contact, multilingualism, and standardization. This instigated an avalanche of research into dialect variation, writing systems, pidgins and creoles, and the like. Especially in variational linguistics and creole studies, the influence of the non-linguistic environment on language development is still very salient, and from time to time the term *ecology* sticks up its head in this context (e.g. Mufwene, 2001; Ansaldo, 2009).

The work of other linguists and anthropologists followed a rather different path and reinterpreted *environment* and *ecology* in a different, more literal fashion. They gradually focused more on the relationship between biological and linguistic diversity (see e.g. Maffi, 2005). Not uncommonly, ecolinguistics developed an ideological undertone, with a focus on raising awareness of and preventing linguistic and cultural extinction (Haugen, 2001, p. 60). For instance, Maffi (2005, p. 601) believes ecolinguistics should have "a focus on the relationships between linguistic, cultural, and biological diversity, their global overlapping distributions, and the common threats they are facing."

What these research strands have in common is that (1) they all investigate the relationship between language – or languages – and its environment, however that might be defined exactly, (2) rather than investigating linguistic properties *per se*, they tend to focus on the global structure and diversity of languages, and (3) they do this from a linguistic, anthropological and/or philosophical point-of-view. The first characteristic also underlies the research in this volume. With regard to the second and third, our interests diverge. All of the contributions in this volume are focus on the grammatical structure of language, and are strongly inspired by observation of language use or empirical linguistic research. We have aimed at a balance between theory and practical studies, and our contributors are as much interested in the development of grammatical micro-structure under pressure of the environment (e.g. particular grammatical categories such as evidentiality; see Michael, this volume), as we are in environmental influence on languages in their entirety (Trudgill, this volume; Nichols, this volume).

2.4 Ethnosyntax

Ethnosyntax is an approach to grammatical analysis influenced by linguistic anthropology. It is defined in Enfield (2004:3) as "the study of connections between the cultural knowledge, attitudes, and practices of speakers, and the morphosyntactic resources they employ in speech." He goes on to explain that the field has been interpreted narrowly as the study of direct influences of culture on linguistic structure, but that other linguists also subsume the study of general pragmatic effects such as typicality under its objects of study. This focus on cultural praxis sets the field apart from sociolinguistics, which tends to have an interest in relations between language and social factors outside the speaker's control (such as gender, social class, population size, etc.).

Wierzbicka (1979), who coined the term, uses it most definitely in a narrow sense, and takes the idea as a starting point for her work on Natural Semantic Metalanguage, a semantic framework aimed at constructing a coherent and formalized set of cross-linguistically valid semantic primes (see e.g. Wierzbicka, 1996). Interestingly, this interest in formalization and semantic universals sets her apart from ensuing ethnosyntacticians who envisage the field, with its strong relativist tendencies, as an antidote to formalist and universalist theories of language and, as a result, view her work with some suspicion.

This anti-universalist agenda is clear in more polemical works associated with the ethnosyntax program, such as Everett (2005). In his description of Pirahã, a language isolate spoken in the Brazilian Amazon, he notes the absence of linguistic features often considered to be basic to any human language, such as a counting system, colour terms, and – most controversially – grammatical embedding and recursion, two pillars of formal linguistic theory. He connects this to the general world view of the Pirahã people, and argues this implies that cross-linguistically, "some of the components of so-called core grammar are subject to cultural constraints" (Everett, 2005, p. 622). His article invoked a strong – and sometimes even emotional – response, not in the least because it attacked some of the basic assumptions of formal theories of languages (see Pullum, 2012, for a popular discussion of this poisonous dispute). Most notably, Nevins, Pesetsky, & Rodrigues (2009) set out to refute all or most of Everett's claims and state that "there is no evidence from Pirahã for the particular causal relation between culture and grammatical structure" (Nevins et al., 2009, p. 355). While they do not deny that culture exerts an influence on linguistic structure, it is clear that they would rather minimize its role in grammatical theory.

In general, most work in this relatively small field has been altogether less controversial. Typical research topics include kinship systems (e.g. Evans, 2003), gendered language (Chafe, 2004), and deictic systems (Levinson, 1996). One of

the more fascinating peripheral interests of ethnosyntax is in how our description of grammatical structure might be influenced by our academic training and cultural background (Enfield, 2004, p. 12). This is the subject of Easton & Stebbin's contribution to this volume, who discuss how preconceptions instilled by linguistic tradition might have a profound effect on how we conceptualize the linguistic structure of languages that do not belong to that same tradition.

The general assumptions and goals of ethnosyntax, as they are set out in Enfield (2004, p. 12), are fully compatible with the research presented here, and some of the contributions in this volume squarely take an ethnosyntactic view on grammatical analysis (see Burridge, this volume, and Easton & Stebbins, this volume). One point of difference is that we assume it to be likely that certain extra-linguistic factors beyond the realm of culture exert a direct influence on grammatical structure without the mediation of cultural praxis. An obvious example is the contribution of Nichols, this volume, who describes how geographical altitude influences the diversification of language.

It will be clear that most of the research fields mentioned above focus primarily on the interaction between languages and the socio-cultural reality in which they are spoken. To a degree, our journey in this book will lead us through this familiar terrain – it is after all meant to function as a broad overview. However, as we have mentioned repeatedly above, it is our explicit intention to go beyond the usual suspects and investigate less obvious connections between language and environmental parameters. As mentioned in the previous paragraph, we also do not take it as a given that interaction between grammar and the extra-linguistic environment is necessarily mediated through culture. The intermediary function of culture is probably common, but is likely not universal and has to be established for each individual interaction between language and the environment. The next section gives a broad classification of the types of environmental parameters which existing research has identified as being potential factors of influence on grammatical structure.

3.   Relevant environmental parameters

One of the goals of this volume is to catalogue – however tentatively – the different environmental parameters that are relevant as potential influences on grammatical structures. Within the confines of a single monograph, it would be impossible to give a complete overview, so we will here list major categories of extra-linguistic factors that have been reported to directly influence linguistic structure in general, and grammar in particular. We will indicate in which part of this volume they are discussed.

These categories are just intended as convenient conceptual tools for classification and clarification; they were not inspired by any methodological consideration, and have no theoretical or diagnostic value. They often intersect with more than one of the linguistic subdisciplines discussed in the previous section, and they are not necessarily mutually exclusive. However, they do illustrate the great variety of factors that are believed to be somehow involved in the shaping of grammatical structure. Another note of caution: not all of the research presented below has met with equally wide acceptance from the research community; we will indicate controversies when we are aware of them (ignoring those that pertain to the deep-rooted formalist-functionalist divide in linguistics). We still think it is useful to mention such studies as they represent valuable hypotheses about plausible connections between language and the environment.

3.1   Cultural factors

Under culture, we here understand cultural praxis, that is, the set of conscious behaviours and beliefs that are associated with the expression of a coherent social identity of a specific community. A preoccupation with the connection between culture and grammar has been a constant in at least part of the linguistic and anthropological community ever since the work of Humboldt, Boas, Sapir and Whorf (Boas, 1938, pp. 122–145; Sapir, 1912, 1921; Whorf, 1940, amongst other publications). However, the actual study of cultural influences on the formation of grammar, or specific grammatical features, has never been part of a coherent research field, but rather existed at the fringes of mainly functional, cognitive, and descriptive approaches to linguistics, at least until the coming of ethnosyntax at the end of the 1970s (see above).

An extreme form of the influence of culture on language is language construction or manipulation as a deliberate cultural activity. Modern, relatively well-known examples of language construction include the creation of international languages such as Esperanto and Volapük and the development of fictional languages in literature or film (see relevant chapters in Adams, 2011). Deliberate language manipulation is also important in secret languages. Storch (2011) gives a linguistic and anthropological account of such languages in Nigeria, Uganda and the African diaspora. These languages are typically related to secret ritual knowledge or the conservation of establish social boundaries (e.g. between males and females, insiders and outsiders, etc.). Their creation often involves the deliberate manipulation of their lexicon, phonological system and – less commonly – morphosyntax. Storch makes a number of interesting observations about restrictions on what is manipulated in such languages, for instance that "[n]oun classes are more easily changed than is verbal morphology" (2011, p. 67).

The influence of kinship distinctions on linguistic structure, sometimes termed *kintax*, has been a fruitful subject of study for almost half a century now. Australian languages have been a particularly productive source for such studies, starting with Hale (1966) on kinship terminology in Lardil, an Australian language. Research mainly focuses on unusual kinship and moiety systems, their associated classificatory system (e.g. McConvell, 1985; see also Evans, 2003, pp. 17–20) and pronominal paradigms (Schebeck, 1973), their diachronic development, and the syntactic restrictions they impose. A useful overview and assessment on this phenomenon in Australian languages from a linguistic point-of-view is given in Evans (2003).

Research on other cultural factors usually lacks the thematic unity of kinship research. Gender-based distinctions have often been linked to grammatical developments in various languages and to language change in general (see e.g. Labov, 1972, p. 303). Chafe (2004) describes how in all Northern Iroquoian languages obligatory pronominal prefixes distinguish three genders in the singular, but neutralize the feminine-neuter distinction in dual and plural forms, with the exception of Mohawk, where female referents can be referred to by both feminine and neutral forms. The former indicates female elegance, the latter has been interpreted as derogatory and conveys certain unfeminine characteristics (for instance, when referring to uncommonly large or rude women). The masculine forms also distinguish more grammatical categories than the female forms. Chafe traces this skewed paradigm back to a historical gender imbalance in Iroquoian society, in which "men were conspicuous, often even flamboyant, and invested with decision-making powers, whereas women stayed in the background" (Chafe, 2004, p. 105). On a macroscopic level, the monumental work by Gal (1978) sets out how language shift from Hungarian to German in the Austrian village of Oberwart is strongly correlated to gender, among other social factors, and that especially younger women are vectors for linguistic change. She concludes that abstract social factors, such as the social network in which these women live, have no significant impact on their tendency to switch languages. What does make a difference is "that in their stated attitudes and their marriage choices the women evaluate peasant life more negatively than the men and reject the social identity of peasant wife" (Gal, 1978, p. 14). Their social aspirations are reflected symbolically in their linguistic choices.

Other researchers have pointed out the influence of religious and abstract belief systems on grammar. Burridge (2004) convincingly argues that the religious belief system of Pennsylvania German speakers influenced, among other things, the degrammaticalization of the modal verb *wotte* 'wish' into a fully lexical verb. More controversially, Everett (2005, 2009) attributes the lack of grammatical number, a complex tense system, and any form of embedding in the Amazonian language Pirahã to cultural beliefs that only value immediate experience.

In this book, the influence of cultural factors on grammar is discussed in Part 1. Building on her previous research (see Burridge, 2004), Kate Burridge discusses the influence of the belief in the supernatural on the evolution of grammatical properties in two distinct Germanic cultures and different time periods: the development of modal systems in Pennsylvanian German, the language of modern-day Anabaptist groups in North America, and the expression of experiencer constructions in Anglo-Saxon and early Dutch. Uri Tadmor relates the development of the pronominal system in Onya Darat (Austronesian) to a complex kin relationships resulting from a social life revolving around traditional long houses. Finally, Lev Michael describes the grammaticalization of quotative evidentiality Nati (Arawak, Peru) under the influence of ethical values permeating Nanti society.

3.2   Social factors

Social factors have to do with the social structure and general organization of society; they are typically outside the conscious control of individual members of that society, in contrast to cultural factors, which are the result of beliefs and ritualized behaviours. The distinction between social and cultural influences on language is to some extent artificial. For instance, in Gal (1978), we considered gender to be a cultural construct, because it is evident from Gal's exposition that there is a strong component of free choice involved in the interpretation of gender-based roles in society. On the other hand, in many societies biological sex and its associated social status is not something individuals have much control over. Gal's study also points out that linguistic change is often influenced by a complex interaction of social and cultural factors: gender, age, social status, a rural-urban dichotomy, the wider historical and political context, etc. Despite various areas of vagueness and complex interactions, there are a considerable number of clear-cut cases where social factors outside the conscious control of individuals, or social groups, exert an influence on the linguistic development. Dialectal variation, for instance, does not typically arise from deliberate choices made by the respective communities, but is also influenced by rather abstract phenomena such as the degree of isolation of the community (Schreier, 2009), and community size, structure, and density (Trudgill, 2011).

The influence of various social factors on language development and grammatical structure has been well-documented in sociolinguistics, dialectology and – to a lesser extent – linguistic anthropology, both for well-known Western languages and for smaller languages in other parts of the world. Typical factors under research include regional variation, age, gender, ethnicity, social stratification, genres and specific social settings, community structure, power relationships,

the acceptance and perception of specific social groups, and interactions between societies. These phenomena are elaborately described in most sociolinguistic handbooks (Coulmas, 1998; Hudson, 1980; Trudgill, 2001; Wardhaugh, 2006, and many others) and we will here forego an in-depth overview.

Language standardization is a cultural phenomenon (by our definition) in as far as it contains a prescriptive component (e.g. Milroy & Milroy, 1985). However Haugen (1966) also points out that, in addition to the importance of societal acceptance of prescriptive norms, the development of certain speech varieties into standard languages depends on the socio-economic and political development of their associated heartland. The relationship between empire building and global language development is the subject of Ostler (2006); it is unthinkable that these processes would have no influence on the development of certain grammatical phenomena.

One area in which the influence of social factors on grammatical structure is uncontroversial is the case of cultural contact, which if sustained seems to lead almost unavoidably to language contact. Whereas traditional research on language contact tended to focus primarily on lexical borrowings, there is now ample evidence that the borrowing of grammatical structures and templates through language contact is extremely common and that almost anything grammatical can be borrowed, from conjunctors and pronominal paradigms to word order (see Matras & Sakel, 2007, for an overview and examples). On an abstract level, we have a decent understanding of the parameters involved in language contact and their effect on grammar (Aikhenvald, 2006, provides a discussion). The diversity of the concrete social factors involved in this process means that it will take some time before we get a truly comprehensive view. Aikhenvald only cursorily mentions population size, degree of urbanization, marriage habits, trade, warfare, lifestyle and occupation, division of labour, and religion.

One specific type of language contact has received a disproportionate amount of attention in the literature. Sustained contact between two or more linguistic groups without a common language for communication can lead to the creation of pidgins and – if intergenerational transmission sets in – creoles. Siegel (2009) describes the development of an extremely complex linguistic ecosystem on the multi-cultural and multi-lingual plantations on Fiji, where alongside Fijian, English and Melanesian Pidgin English, and various Indian and Austronesian languages, two distinct pidgins developed, Plantation Pidgin Fijian and Plantation Pidgin Hindustani. One other well-documented cause of language contact is migration. Clyne & al. (this volume) gives an overview of how this process works in the highly multicultural context of Melbourne, Australia.

Certain global societal properties have also been postulated to influence the grammatical structure of languages spoken in that society. Trudgill (2011) – see also his contribution to this volume – argues that a major factor of grammatical

change is the relative stability of a society, its social density, and its degree of isolation. He hypothesizes that small, relatively stable societies with a relatively high social density are disproportionately more likely to develop complex morphosyntactic feature systems. Based on computer simulations, Wichmann, Stauffer, Schulze, & Holman (2008) somewhat controversially postulate that an increase in population size will tend to slow down linguistic change. Similarly, Nettle (2012, p. 1835) reports a (relatively weak) correlation between population size and the linguistic complexity of languages: "Languages of small communities tend to have smaller phonological inventories, longer words and greater morphological complexity than languages spoken in larger communities." The studies of both Wichmann and Nettle are based on quantitative analyses of data in the *World Atlas of Language Structures* (Dryer & Haspelmath, 2011), and have been met with considerable criticism – sometimes healthy, sometimes unreasonable – mainly related to their methodology and the granularity of the WALS data. They both attempt to explain the development of global linguistic properties in terms of quantifiable evolutionary processes (see also *Natural factors* below).

The influence of social factors on grammatical structure is discussed in Part 2 of this book. In an extension of previous research, Trudgill postulates a relationship between closely interconnected small-scale societies and the development of complex and rare grammatical features, and its implications for historical linguistics. Clyne & al. give an overview of linguistic variation and change in migrant communities in Melbourne, Australia.

3.3   Geographical factors

The influence of geography and the geophysical environment on various aspects of grammar has been a prolific subject of study, its universally perceived importance surpassing linguistic ideologies and traditional divisions between syntax, semantics and pragmatics. This is undoubtedly so because spatial perception and reasoning is central to our interaction with our *Umwelt* and is therefore prominently present in the grammar of most languages of the world.

Traditional grammatical research on the relationship between the spatial environment and linguistic structure has been mainly directed towards spatial deixis. No grammar of a language is complete without a thorough description of its demonstrative paradigm and an overview of its directional verbs. It is impossible to give even an incomplete overview of all the work done in this field, nor would this be particularly useful here: work on deixis is typically only concerned with the grammatical behaviour of deictic categories and more often than not barely acknowledges the external spatial reality that led to the creation of these categories (Langacker, 1982, is one example).

The role of the geographical context in the development of grammatical categories expressing space and motion has come under systematic investigation only recently. In the last decade, much interesting research is connected to or inspired by the language and space research program at the *Max Planck Institute for Psycholinguistics* (Levinson, 1996, 2003; Levinson & Wilkins, 2006; Burenhult & Levinson, 2008). Typical topics are the conceptualization of space relative to culturally determined coordinate systems (so-called frames of reference; Levinson, 2003; Levinson & Wilkins, 2006; Senft, 2006; O'Meara & Pérez Báez, 2011) and the culture-specific categorization of landscape terminology (Burenhult & Levinson, 2008).

A third strand of research does not focus on the expression of space through linguistic categories, but on the influence, either direct or mediated through culture, of geographical features on linguistic diversity, complexity, and the global structure of languages. Nichols (1992) discusses possible relationships between various properties of geographical areas and grammatical properties of languages or language groups. She introduces the notions of spread zones and residual zones as two geophysical types that have a distinctive influence on language diversification. The former are areas of swift linguistic spread, often dominated by one or a few languages or language families; the latter tend to be conservative, highly diverse areas of great linguistic complexity. Her strongest claim is that a global east-west asymmetry exists in the distribution of grammatical features such as head/dependent marking, plurality neutralization and the presence of an inclusive/exclusive distinction, corresponding to the initial spread of human language from Africa via Europe into Asia (Nichols, 1992, pp. 254–259).

Enfield (2005) describes the areal spread of linguistic features, across language family boundaries, through Mainland Southeast Asia. For instance, languages in this area tend to be isolating, often have an elaborate class of expressive nominal and verbal compounds formed through alliteration or rhyme, and tend to have classifiers, politeness distinctions in pronominal paradigms, and pragmatic sentence-final particles. Areal features are the result of gradual diffusion through contact (see *Social factors* above), a process that is influenced by social as well as geographical factors.

A number of abstract features of the geophysical environment have been postulated to have an influence of some sort on linguistic development. Very often, such hypotheses have been a matter of contention. This is not the case for geographical distance, which has been recognized as an uncontroversial determinant of linguistic diversity. Geographical contiguity tends to result in language contact, and has traditionally been associated with the development of progressive variants, an exchange of linguistic features, and decrease in diversity. On the other hand, geographical isolation is typically linked to linguistic conservativeness and language

diversification. However, as Schreier (2009, p. 696) points out, linguistic isolation is hardly ever a purely geographical factor but "a multi-faceted phenomenon with regional, social and sociopsychological dimensions." For instance, many languages of Micronesia are part of large dialect chains spanning entire small-island chains stretching out over areas of several hundreds of kilometres, a situation that could only arise in a society with highly developed seafaring technology. Marck (1986) discovered that these chains were only kept intact when the distance between two islands was at most a day's voyage, because this allowed the inhabitants to maintain "patterns of social interaction with that island's inhabitants that resulted in maintenance of mutual linguistic intelligibility between the two populations."

In recent years, an increasing body of quantitative research has related linguistic diversity (and sometimes complexity) to climatic zones. Mace & Pagel (1995) find that linguistic diversity follows a latitudinal gradient, with language diversity increasing towards the equator and, additionally, that ecological and linguistic diversity are statistically correlated independent of latitude (see *Natural factors* below). Nettle (1996, 1998) comes to very similar conclusions and attributes this phenomenon to the fact that, particularly in pre-modern societies, tropical and subtropical climates are more conducive to year-round agriculture and as such allow for the sustained existence of smaller social groups that for their survival do not need to engage with external groups, for instance through trade. This isolating factor in turn leads to increased linguistic diversity. More controversially, Laitin, Moortgat, & Robinson (2012) claim that "linguistic diversity should be more persistent to the degree that a geographic area is oriented more north-south than east-west." The underlying presumption is that, as with the spread of animals and plant species, it is easier for languages and other cultural constructs to spread within the same climatic band.

Part 3 of this book contains three contributions discussing the various influences of geographical factors on grammatical structure. Palmer's contribution is an excellent example of areal linguistic research in the Levinsonian tradition. He redefines the concept of absolute frame of reference and argues that it is based on topographical features of the extra-linguistic environment. Frowein describes an unusual system of directional words in Siar, an Oceanic language spoken in New Ireland, that is based on the general topography of the physical environment. Finally, Nichols extends her definition of spread zones (linguistic areas that facilitate the rapid expansion of languages at the expense of others; see discussion above) by incorporating altitude and geographical delineation (open vs. closed areas).

3.4   Natural factors

Especially in recent years, there has been an increased interest in the influence of the natural environment on linguistic – and more broadly cultural – development.

Much of this interest appears to be inspired by a perceived analogy between biological and linguistic evolution, the rationale being that language is an evolved property of the human species and that therefore language change is subject to the same or similar adaptive pressures as biological evolution. This idea goes back to Darwin, who in *The Descent of Man* remarked that "[t]he survival or preservation of certain favoured words in the struggle for existence is natural selection" (Darwin, 1871, p. 61).[4] It is not exactly clear to what extent this correspondence between natural and cultural evolution exists (although it is clear that languages cannot really be equated to living organisms). We will sidestep this thorny issue here, as we are mainly interested in the effect of specific natural factors on grammatical development.

The search for connections between biological and linguistic diversity has often focused on large-scale relationships between linguistic, cultural and ecological diversity. Apart from adherents to the ecolinguistics program (see Fill & Mühlhäusler, 2001; Maffi, 2005; and also *Ecolinguistics* above), this subject has in recent years received quite some attention from biogeographers (see Cox & Moore, 1993 for an introduction to the field), who through quantitative analysis or simulation try to establish correlations between particular natural or ecological indicators and linguistic diversity. Invariably, they are looking for direct correlations: it is generally assumed that cultural and linguistic diversity increase with ecological diversity. Often, the actual subject of study is human cultural diversity, and linguistic diversity is used as a proxy (see e.g. Nettle, 2009).[5] A number of studies have found quantitative evidence corroborating this claim (Gorenflo, Romaine, Mittermeier, & Walker-Painemilla, 2012; Mace & Pagel, 1995; Manne, 2003). However, not all studies find an equally strong correlation. For instance, Moore et al. (2002, p. 1645) state that "the form of the relationships between species richness and language richness and environmental factors differs, and it is unlikely that comparable mechanisms underpin the similar patterns of species and language richness." Nevertheless, they do find strong evidence for influences of various natural environmental factors on both linguistic and biological diversity. Axelsen & Manrubia (2014) compare the influence of various environmental and geographical factors on linguistic diversity in different continental regions. Their data indicates that only river density and landscape roughness consistently

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4.   Darwin actually refers back to Max Müller, who translated August Schleicher's words in a most poetic fashion: "A struggle for life is going on amongst the words and grammatical forms in each language" (Müller, 1870, p. 257).

5.   This is problematic, as it is not certain that a straightforward correlation between linguistic diversity and other cultural factors exists; see (Moore et al., 2002).

correlate to linguistic diversity globally; other variables are only significant within certain regions. For instance, altitude is a meaningful predictor of linguistic diversity only in the Americas, and average temperature only in Africa and Asia, but not in Europe or the Americas. Research like this has remained somewhat peripheral to the linguistic enterprise, and tends to be met by varying degrees of hostility in general linguistic circles. To our knowledge, there are few, if any, linguistic analyses of the direct influence (i.e. not mediated by culture) of natural phenomena on the development of specific grammatical features.

Throughout the years, a number of specific environmental factors have been linked to linguistic diversity and linguistic change. In extreme cases, cataclysmic events such as floods, earthquakes or volcanic eruptions can wipe out entire language communities. Crystal (2000, p. 71) gives an account how in 1998 the destruction of three ethnic communities on the north coast of Papua New Guinea by an earthquake meant the disappearance of their three languages. Such events are relatively rare, but their impact on linguistic diversity on a local level is absolute.

There is an obvious correlation between geography and geology on the one hand, and biological factors on the other. In the previous section on geographical factors, a number of studies established a link between latitudinal bands and linguistic diversity (Mace & Pagel, 1995; Nettle, 1996, 1998). In fact, this correlation does not hold between linguistic diversity and geographical features by themselves, but between linguistic diversity and the influence of various geographically climatic factors on the natural ecosystem. As such, it is evidence for the adaptation of language to its natural environment.

Some research attempts to explain correlations between cultural-linguistic and biological diversity in terms of environmental productivity. Focussing on cultural diversity, but implying a correlation between ethnic and linguistic groups, in Latin America, Duin & Wilcox (1994) investigate the influence that the instrumental utility of ecological regions (i.e. their suitability for agricultural and other economic activities) has on cultural diversity. They conclude that "the relationships between the types of diversity - biological and cultural - and between cultural diversity and biological utility, show strong positive correlation." From a historical angle, it has been asserted that the development of agriculture and its subsequent population expansion is responsible for the spread and current distribution of many present-day language families (Bellwood, 2001; Diamond & Bellwood, 2003). This causal relationship has been most famously claimed for the Austronesian (e.g. Bellwood, 1984, 1995) and the Indo-European (Renfrew, 1987) language families. The farming/language hypothesis has repeatedly been called into doubt (e.g. by Oppenheimer & Richards, 2001; Donohue & Denham, 2010). Kemp et al. (2010) compares the distribution of mitochondrial and Y-chromosomal DNA to that of the Uto-Aztecan language family. They find no

significant relationship between the spread of populations and the Uto-Aztecan languages. The results of Hammarström (2010) are more ambiguous. He compares language family size and geographical spread to the subsistence type of their associated population groups. He finds at best a weak influence of the development of farming on the size of language families, although this might be due to confounding geographical or other factors. He proposes that, alternatively, the relationship could have been the inverse: the spread of population groups (and therefore languages) with a large average family size might have influenced the spread of agriculture.

More exotically, the prevalence of pathogens has been proposed as an influence on linguistic diversity. A relationship between low pathogen stress and an increase in cultural diversity or the formation of large-scale empires has been postulated in the anthropological literature (e.g. Cashdan, 2001). Fincher & Thornhill (2008) postulate that "human language richness across countries positively correlates with parasite richness" (Fincher & Thornhill, 2008, p. 1293), because the presence of potentially dangerous disease in communities increases the chance of ostracism and therefore social division.

On a more abstract level, various researchers have attempted to model linguistic change mathematically as a process similar to natural selection. A typical example is Atkinson, Meade, Vendetti, Greenhill, & Pagel (2008), who argue that language evolution is not gradual, but consists of rapid bursts followed by relatively long periods of stagnation (see also Dixon, 1997, and Silva & de Oliveira, 2008, who mathematically model language spread as a process of biological colonization. Lupyan & Dale (2010) and Dale & Lupyan (2012) differ in their approach, in that they model the development of morphosyntactic complexity, rather than global linguistic diversity, in evolutionary terms as adaptations of languages to their environment. This type of approach merges the distinction between natural and socio-cultural influences on language. It also builds a bridge between the studies in human biogeography above and linguistic typological research, which focusses on the distribution of fine-grained grammatical features across languages and language groups. Their contribution to this volume presents a model for conceptualizing linguistic differentiation as an evolutionary process driven by complex interactions of language users and their environment.

3.5   Human biology

An obvious extra-linguistic influence on linguistic development is human biology in its widest sense. The idea that human language is restricted by various aspects of human physiology will not sound controversial to any linguist. The extent and exact nature of such restrictions has been, and still is, debated vigorously. This is

not a matter we will dwell upon in this book, since we are mainly interested in influences external to the human individual.

We will shortly discuss research correlating genetics and linguistics. Since these studies investigate plausible relations between environmentally induced human migration patterns and the resulting ethnic diversity on one hand and linguistic differentiation on the other they are often relevant to the previous two subjections. For instance, we mentioned above Kemp et al. (2010), who use DNA analysis to reconstruct ethnic diversity, which they then compare to the diversification of the Uto-Aztecan language family. Barbujani & Sokal (1990) report that sharp genetic differences between adjacent populations in Europe tend to coincide either with substantial geographical obstacles or with boundaries between language families or individual languages. They conclude that "language barriers may oppose the process of population admixture" (Barbujani & Sokal, 1990, p. 1818). In all likelihood, this is a linguistic influence on genetic diversity, rather than the other way around. Ward, Redd, Valencia, Frazier, & Pääbo (1993) compare genetic and linguistic diffusion in three Native American tribes. Contrary to expectation, they find that there is no correspondence between the two factors, either in terms of the speed of change or the order of phylogenetic splits. This suggests that "linguistic diversity is generated in a fundamentally different way from genetic diversity" (Ward et al., 1993, p. 10667). Finally, Lansing et al. (2007) conclude that on the relatively small island of Sumbawa in Indonesia, there is a clear correlation between linguistic and Y-chromosomal differentiation, suggesting that both evolved in tandem. It is evident from these examples that the exact relationship between genetic and linguistic diversity is far from clear.

3.6   Meta-perception of language

Finally, one often-ignored influence on linguistic structure is the very act of conducting linguistic research and, more broadly, our perception of language. This can affect both the structure of language itself and our perception of that structure. The former happens when prescriptively oriented linguistic research, or societal pressure, leads to the introduction of certain grammatical, lexical, or phonetic restrictions. For instance, at the time of writing, a London school introduced a prohibition on the use of slang words and constructions, including contractions such as *innit* 'isn't it' and the informal forms of the English copula *you/we woz* 'you/we were' because such terms are deemed inappropriate in formal settings (Fishwick, 2013).

Enfield (2004, p. 11) remarks that "grammatical description is constrained by culture-specific assumptions, objectives, expectations, superstitions, and taboos." Some constraints might be consciously introduced, as when a grammarian selects

what they should include in and exclude from a grammar based on its target audience (Mithun, 2006). This is not a problem, as long as one is aware of the fact that some form of selection has taken place. Other constraints are introduced by our specific cultural and theoretical viewpoints and our education. This type of bias is ubiquitous in our conceptualization of linguistic structure, and is much more difficult to detect because it is almost always ignored or underestimated. Mithun (2006, p. 285) hints at it when she says:

> A potential danger in over-inclusiveness is that of shaping the description of a little-known language in terms of the structures currently recognized in better-known languages.

LaPolla (2001, p. 236) points out that in their descriptions of Tibeto-Burman languages Indian linguists tend to focus more on complex paradigms and verb forms, while Chinese linguists often end up with tonal systems in their descriptions. These biases reflect the fact that the former are typically trained in Sanskrit, a language with a complex morphology but without tone, and the latter in Chinese, a tonal language with strong isolating tendencies. Diller (2004, p. 32) points out a similar problem for theoretical analysis when he remarks that most native speaker linguists have received a Western education and tend to analyse their own languages in terms of Western linguistic frameworks.

In the present volume, this problem is discussed by Easton & Stebbins. They give examples of how the perception of language is determined by the social values, interests and intensions of the observer and they introduce a conceptual framework for thinking about the unavoidable conceptual biases that are introduced when languages are being described, analysed, or even just talked about.

This concludes our overview of different factors that have been asserted to exert an influence on linguistic structure. We hope we struck a good balance between influences that are generally recognized to exist by the linguistic community and those that are more exotic and less accepted, but might point towards interesting avenues for future research. This book provides a number of case studies that illustrate all except one of the main categories discussed above. We aimed at a balance between more general, theoretically oriented chapters and very specific examples of how specific environmental factors influence specific languages.

Beckner et al. (2009) is one of the increasing number of publications that in recent times referred to language as a complex adaptive system. Although he never uses this specific term, Keller (1994) has essentially the same idea, conceiving languages as "emerged systems of social rules" (p. 43) in which change is driven by evolutionary change (see also LaPolla, this volume). If these scholars are correct in assuming that language is an adaptive system, it has to be adaptive to something. This book certainly makes no claim at being in any way comprehensive; it is meant

as an invitation to join an exciting new direction in linguistics, which considers language and linguistic structure as a complex system that functions in – and can only be understood in terms of – a larger context of use. If we hope the reader will remember one thing about this book, it is that language is not an autonomous system, and its interactions with its environment are more varied and complex than we had previously assumed.

Finally, we would like to dedicate this work to the late Michael Clyne, a leading light of the Australian sociolinguistics scene, known for his research on immigrant languages in Australia, but probably even more for his friendly, compassionate nature. At the workshop that inspired this volume, he gave one of his last talks. His conference notes have been turned into a chapter of this book by Yvette Slaughter, John Hajek and Doris Schupbach. We hope it is a worthy memento to his life and work.

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PART 1

Grammar and culture

On the logical necessity of a cultural and cognitive connection for the origin of all aspects of linguistic structure

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This chapter presents a view of communication not as coding and decoding, but as ostension and inference, that is, one person doing something to show the intention to communicate, and then another person using abductive inference to infer the reason for the person's ostensive act, creating a context of interpretation in which the communicator's ostensive act "makes sense", and thereby inferring the communicative and informative intention of the person. Language is not necessary for communication in this view, but develops as speakers use linguistic patterns over and over again to constrain the addressee's creation of the context of interpretation. Speakers choose which aspects to constrain the interpretation of, and language forms conventionalize from frequent repetition. As constraining the interpretation requires more effort than not constraining it in that way, it must be important to the speakers to constrain that particular aspect of the meaning, otherwise they would not put in the extra effort. Logically, then, the forms that do conventionalize must have been motivated by the cognition and culture of the speakers of the language when they conventionalized, even though over time the motivation is often lost and the form continues to be used only due to convention and habit.

1.   Cognition: Inference in understanding our surroundings

The basis of our ability to make sense of our experiences in life is our ability to perform abductive inference. Abductive inference is hypothesis creation: when we observe some phenomenon, we try to think of a reason why that phenomenon might be the way it is. We do this based on what we know and believe, by creating a context in which the observed phenomenon makes sense to us, that is, is not surprising. So if we see the sun moving across the sky from east to west every day, we will posit a reason for it. The ancient Greeks hypothesized that it was the god

Helios driving his chariot of the sun across the sky. Modern science hypothesizes that it is the earth rotating on its axis that gives the impression of the sun moving. Both of these hypotheses derive from the same cognitive ability. In fact all of the hypotheses of philosophy, religion, and science derive from this ability. It is in fact a human instinct, on a par with other basic survival instincts, as it is necessary for survival: one needs to be able to understand or at least make sense of one's surroundings in order to effectively survive in them.[1] Above I mentioned an example of a major phenomenon, but we do this with very minor phenomena as well, such as one time, when I was given a plate and napkin after sitting down in a restaurant, I wondered why the napkin had a crease in the shape of a ring in the middle of it. I hypothesized that the plates and napkins had been stacked together (with interleafing) prior to their distribution to customers.

This sort of inference is non-deterministic, unlike deductive inference, where the truth of the premises guarantees the truth of the conclusion. In abductive inference, unless we go out and test our hypothesis or look for evidence supporting the hypothesis, we have no way of knowing whether our hypothesis is correct or not. Yet we will assume it is true until it has been proven wrong. This is in fact the nature of facts in science: they are hypotheses we haven't proven wrong yet, and so take them as truths.

One part of trying to understand the world is trying to understand what other humans are doing and why, and we do this also by applying our abductive inferential abilities to infer the nature of an action when it is performed by someone, and the intention of the person in doing that particular action. We do this automatically, and unconsciously much of the time, and this again is part of the survival instinct, as in order to survive we must be able to infer the intentions of others when they do something, because what they are doing might be with the intention of harming us. For example, if someone walks toward me with a knife in his hand, I need to be able to infer his intention in doing so, so that I can take appropriate action. We make the inferences on the basis of our own experiences, knowledge, and motivations (we project our own motivations on others).

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1.   The initial identification of abductive inference is due to Peirce (1940), who called it hypothesis, abduction, presumption, and retroduction, as well as guessing. See Givón (1989, Ch. 7); Levinson (1995) on abductive inference and its role in communication, and Deutscher (2002, p. 484) on possible uses of the concept of induction in understanding language learning and historical change. In the philosophy of science abduction is sometimes talked about as "inference to the best explanation" (e.g. Harman, 1965; Lipton, 1993; Josephson & Josephson, 1996). Cf. Sperber & Wilson's 1st principle of relevance: "Human cognition tends to be geared to the maximisation of relevance" (Sperber & Wilson, 1996, p. 260/270). See also Grice (1957, p. 387) on the crucial role of relevance in determining meaning.

One part of trying to understand what other humans are doing and why is inferring their intentions when they do something with the intention of having you guess their intentions in doing the action. That is, I might wave my hand in a particular way, and you may guess that I am batting away flies around my head, but I might do it in such a way as to make it obvious I want you to notice I am doing it and want you to infer my motivations for doing it. If you then do so, that then is communication.

2. The nature of communication: Ostension and inference

> [C]ommunication is not accomplished by the exchange of symbolic expressions. Communication is, rather, the successful interpretation by an addressee of a speaker's intent in performing a linguistic act.   (Green, 1996, p. 1)

I would quibble with Green's statement in the quote above only in that I would say this is relevant to all communicative acts, not just linguistic communicative acts. A person wishing to communicate something does an *ostensive act*. Ostension (from Latin *ostendere* 'to show') is doing something that shows one is doing the action with the intent of having the other person notice the action and infer the intentions behind it – that is, showing one wants to communicate something. Using abductive inference, the other person must *infer* (guess) the communicative intention behind the ostensive act. Communication then involves *ostension* and *inference*.[2]

This inference is possible because we assume people are rational and do things with particular goals in mind (Grice, 1975, 1978). This is the core of Grice's (1975, 1978, 1989) Cooperative Principle. Since we assume the person has a reason for doing the particular action, and the person has done it in an ostensive way to show the desire to communicate, we will make an effort to find the relevance of that action, that is, try to infer the reason for the person doing the action.

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2.   The idea of communication being based on getting the addressee to recognize one's intention to communicate goes back to Grice (1957). The formulation of this into the idea that communication involves ostension and inference is due to Sperber & Wilson (1996), but I depart from Sperber & Wilson and Relevance Theory generally in not accepting a coding-decoding stage, or explicature/implicature stages, in the process of communication. I also do not accept their distinction between conceptual (lexical) and procedural (grammatical) information, as I have argued that all information is 'procedural', i.e. constrains the creation of the context of interpretation. This departs also from Gumperz's (1977, 1982, 1989, 1992a, 1992b) sense of contextualization cue in seeing all of language as contextualization cues. See LaPolla (2003) for detailed discussion.

The communicator also makes inferences as to what the hearer will be able to understand, and then uses the ostensive act most likely to facilitate the inferential process of the hearer.

Communication can take place with or without language. Functional MRI studies show that non-linguistic and linguistic communication are processed in the same areas of the brain, including those referred to as "Broca's area" and "Wernicke's area" (Xu, Gannon, Emmorey, Smith, & Braun, 2009).[3] Language helps to constrain the inferential process to make it easier for the hearer to infer the speaker's intention. The difference between non-linguistic communication and linguistic communication is simply a difference of tool or mode, with a resulting difference in precision: it is like the difference between ripping paper into two pieces with your hands and cutting it carefully with scissors. You are more likely to get the outcome you want using the specialized tool because it constrains the process.

The inferential process can be more or less constrained, but never constrained completely (in a fully deterministic way). Consider for example, the exchange in (1):[4]

(1)   Guest: (Sitting at dinner table, looks at hostess and points up and back
                     with raised eyebrows).
         Hostess: *It's the first door on the right.*

In this exchange the first communicator did not use any linguistic form, but assumed that using simple hand and face gestures would be enough to communicate his meaning. In the particular context in which this happened, during a dinner party, it was sufficient for his meaning to be understood correctly, as evidenced by the host's response and the guest's subsequent successful finding of the bathroom. Notice the host assumed she understood correctly and used a minimum expression in replying and the guest assumed the host understood correctly and so followed the directions without question; neither of the interlocutors ever mentioned "bathroom", but both assumed that is what they were talking about. If the guest had wanted to constrain the host's inference of his communicative intention, he could have used a number of different linguistic forms to constrain the interpretation, such as saying "Bathroom?" while making the gestures, or by saying something like "Could I use your bathroom?" or "Where is your bathroom?" or "Is your bathroom down that hall? I'd like to wash my hands." Each of these would

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3.   See also Grice (1957, pp. 387–388) on the similarity of inferring the intentions behind linguistic and non-linguistic behaviour.

4.   All of the data and examples used in this paper occurred naturally, and were personally witnessed and/or experienced by me.

constrain the interpretation to a greater extent than not using linguistic forms, and would do so to different degrees. Adding an explanation would constrain the host's inference of why the person wants to go to the bathroom (which she would do in any case). Note how the grammatical or procedural marking (e.g. tense marking) and the so-called lexical meaning or conceptual items used are both constraining the creation of the context of interpretation.

In (2) is another example, which occurred when I was calling role just before a class in Hong Kong.

(2)   Teacher calling role: *Alain?*
      Student points to empty chair: *Toilet.*

In this exchange I said only one word, but the students understood I was asking if Alain was in the room. From the response I understood 'Alain had been there, sitting in that chair, but had gone to the toilet, and would be back, so do not mark him as absent'. The single word plus the gesture was enough to get all of that meaning across in that context, but it required a lot of relatively unconstrained inference on my part. Alternatively the student could have used a much more explicit linguistic form to constrain my creation of the context of interpretation more greatly, and/ or constrain different aspects of the interpretation, such as by saying "Alain will be right back", or "He's in the toilet", or "Alain was here, but he is now in the toilet, but will be coming back, so please don't mark him as absent". Each of these constrains the interpretation more than the one before it, but they all can be used depending on the particular context and what the communicator assumes the addressee can infer. Again, in the more complex version there is both so-called conceptual and procedural information, but both are involved in constraining the interpretation more than would be the case without them.[5]

Even when there is an obligatory constraint on the interpretation, such as the use of tense in English, there is still much room for inference, as in (3):

(3)   a.   *I have had lunch.*
      b.   *I have been to the mainland.*

Here both clauses have been marked with past tense, and so the context of interpretation would be constrained so as not to include any assumptions that relate to future or present events, but how far back in the past the addressee understood the

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5.   Notice here that the usual lexical meaning of *toilet* is not what is crucial here. If you check any definition of *toilet*, you will not find what is crucial about its use here, which contrasts it with, for example, *the library* or *the cafeteria,* which would not have given the same sense: a toilet is a place you go to and come back very soon from, and that is what is important in this context.

event to have happened depended on inference from relative relevance based on the particular context. In the context of (3a) what was relevant was whether the person had eaten in the last hour or so, and in (3b) what was relevant was whether the person had ever been to mainland China.

The degree to which the hearer is forced to deduce a particular interpretation depends on the degree to which the form of the ostensive act constrains the hearer in choosing the contextual assumptions necessary to create a context of interpretation in which the particular action or utterance makes sense.

3.   The nature of language: Language is culture

Although *culture* is a controversial term in some circles, I am using it here for the evolved sets of social conventions, personal habits, and conventionalized tools for carrying out particular tasks. Language is the set of conventions for carrying out the task of communication, and so the 'rules' of language use are evolved sets of social conventions for constraining the process of interpretation. Lexical and grammatical meaning is simply conventionalized use, so grammaticalization and lexicalization, the processes which create language structure (words, phrases, and grammatical forms), are in fact simply conventionalization of repeated patterns.[6]

Language is not a fixed system, it is human behaviour, and changes as we engage in it, like other aspects of our behaviour, such as styles of dress and cooking/eating. It isn't purpose-built, and doesn't exist as an entity anywhere. It is an emergent phenomenon (Hopper, 1987, 2011, 2012), a complex system that is more than the sum of its parts, and so cannot be explained by adding up the individual causalities (cf. Dryer, 2006). It is like an economy or a traffic jam: it comes into being as a by-product of our trying to communicate (Keller, 1994). It comes to be recognized, much like a path worn through a grassy field might be eventually paved, and so words are put into dictionaries and grammar books are written, but that is just a snap-shot of the uses of those words and patterns up to that point. Our knowledge of language is simply our experience of how words and structures have been used before to achieve a certain purpose. The "rules" of language are simply conventions, much like the convention of men wearing pants and women wearing skirts, and change all the time.

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6.   Although grammaticalization is conventionalization, not all conventionalization is grammaticalization: the speakers are free to conventionalize any sort of usage, including so-called 'degrammaticalization'. See Burridge, this volume, for an example of degrammaticalization. See also Michael, this volume, on seeing sedimentation of activities into social practices in social practice theory and grammaticalization as having a common basis.

What gets repeated, and what extensions of meaning are evidenced in the usages, are related to the cognitive categories and construal of the world of the speakers in two ways. First, for some form to become conventionalized, it would have to have been repeatedly used until it became a habit on the personal level and a convention at the societal level. For the speakers to use the form over and over again to constrain the interpretation in the particular way that that form can constrain the interpretation would have required the speakers to want to constrain the interpretation in that particular way over and over again. For this to be the case having the addressee understand the particular aspect of the interpretation that is constrained by that form must have been important to the speakers. So the patterns that get repeated will reflect those aspects of meaning that are important to those speakers. They would not put the extra effort into constraining the interpretation of the meaning that way unless the aspects of meaning that were so constrained were important to the speakers. Put another way, the patterns that get conventionalized reflect an aspect of the culture of the people; the language will embody the culture of the people.[7]

Second, once the particular pattern of constraining the interpretation has become conventionalized, it will be passed down through the generations, and influence how the speakers understand the world, that is, what cognitive categories they will form (see for example Majid et al. 2004 and similar work by Melissa Bowerman and colleagues):

> [L]anguage produces an organization of experience. We are inclined to think of language simply as a technique of expression, and not to realize that language first of all is a classification and arrangement of the stream of sensory experience which results in a certain world-order, a certain segment of the world that is easily expressible by the type of symbolic means that language employs. In other words, language does in a cruder but also in a broader and more versatile way the same thing that science does.   (Whorf, 1956, p. 55)

Our language use is a set of habits we form, which are very hard to change. We are very much creatures of habit, and once we have a habit, it is hard to change, including habits of language and even thought. The simplest example is the habit we form in learning our first language: we learn to categorize certain sounds together

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7.   Lupyan & Dale, this volume, in trying to understand why languages develop complex morphological systems, consider the possibility that the redundancy that comes with complex morphological systems may facilitate language learning by children. The view presented here is consonant with their view in that the redundancy is seen as arising from repeated attempts to constrain the addressee's interpretation of the speaker's communicative intention, which of course includes situations where children are the addressees.

as allophones of a single phoneme, and to distinguish other sounds our language treats as distinct phonemes. This is entirely a habit, but as anyone who has learned a second language (or taken a class in phonetics) knows, it is difficult to break the habit and make distinctions we're not used to making.[8] The habit even influences our perception. For example, at a meeting here in Singapore the speaker was talking about a sports ground using the word *pitch,* but pronounced [pitɕ], with an unaspirated voiceless stop in initial position. A monolingual English speaker sitting next to me 'heard' the voiceless unaspirated stop as a voiced stop and asked why he was talking about a beach. This is also what is involved in second language learner accents. The point is not that you can't learn another set of habits, just that it is difficult.

It is also difficult to learn a new way of thinking, especially if you try to do it using words and concepts that are part and parcel of the old way of thinking. It isn't that language fully determines thought; the language evolves the way it does because of the importance the culture puts on constraining inference in certain ways, and this process is always on-going, as language is always changing, so the culture and cognition of the people (how they profile events, etc.) influences the language, but then once it becomes a convention in the language, it is passed on to future generations, and so will influence how people think about those things, and what they pay attention to. Once you have a word for something, e.g. *selfie,* it makes the phenomenon a lot easier to think about and talk about, and you end up thinking about it and talking about it more. Although thought is of course possible without language, when we generalize some fact about the world, we give it a name, and then we can talk about it more easily, and also pass the concept down to following generations. Very often the name we give to some generalization, or the way we conceive of a phenomenon, is in the form of a metaphor, and these metaphors help to structure our view of the world (Lakoff & Johnson, 1980; Lakoff, 1987). Language then encodes our view of the world, and also influences our view of the world (as we learn these concepts from our ancestors). When we speak a language we subscribe to the conventions of meaning associated with that language, and those conventions influence the way we talk about things and ultimately how we think about them (Whorf, 1956). A simple example of how the language we use to talk about something influences the way we think about it is something I experienced personally: growing up in the US, I always considered

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8.   This is the cause of the so-called 'critical period' for language learning. It is simply a matter that the longer one speaks only one language, the more ingrained the habits associated with speaking that language are, and so the harder it will be to learn another one (i.e. to change one's habits).

shrimp, prawns, and lobsters as three very different animals because they have very different names in English, but in Chinese they have the same basic name, and only differ in terms of size, *xiā* ('shrimp'), *dà-xiā* ('big shrimp'), and *lóng-xiā* ('dragon shrimp'). When I learned this I was able to think of them as just variants of the same type of animal.

In many discussions of ethnosyntax[9] (see Enfield, 2002, for this term), the etymological opaqueness of certain structures is taken to be evidence that it is not possible to show a link between language and culture or cognition, but to say that the original development of a particular pattern is motivated does not imply that the motivation will always be transparent. As Michael, this volume, p. 123, argues, "it is not plausible to simply project modern communicative habitus into the past". In many aspects of our lives, once a particular way of doing something is conventionalized, the original motivation may be lost, while the conventionalized behaviour continues, simply because it is already a convention and a habit, such as the habit of pouring the milk before the tea in Britain.[10] In English we have expressions and symbols, such as those in (4), that are still used even though the original motivation for using them is no longer motivating the expression and may not be transparent:

(4) *pig in a poke*
     pass the buck
     put it in the hopper
     the stars in the firmament
     carriage return
     ka-ching!
     dial a phone
     RSVP

---

9. The concept of *ethnosyntax* can be understood in at least two different ways: it can refer to the study of the interaction of (or the interface between) two separate entities, culture and grammar, or it can (on analogy with *morphosyntax*) refer to the view that language and culture form one entity. I am arguing for the latter position, that language *is* culture, in that a language is a set of social conventions which have evolved in a particular way in response to the need to constrain the inferential process involved in communication, just as conventions of, for example, eating with a fork and wearing clothes are social conventions that have evolved in response to the need to eat and stay warm, respectively.

10. When the English first started drinking tea, the porcelain was of poor quality, and would crack if the tea was poured directly into the cup. So the milk was poured first to protect the cup. Later this was no longer necessary, but the practice continues for many people.

All of these were fully motivated at an earlier time, but now most people who use these expressions don't know what a poke is or what the buck is that is passed or why a hopper is called a *hopper*, or why we can call the sky *the firmament*, and computers have no carriage return, and cash registers no longer make a *ka-ching* sound, and phones no longer have dials, and computers no longer have floppy discs, and most people don't know what *RSVP* stands for, but we still say *dial a phone* and use an image of a floppy disc for the 'save' function in computer software and use these other expressions.[11] We have to turn to books such as *Loose Cannons and Red Herrings, and Other Lost Metaphors* (Claiborne, 2001) and *Amo, Amas, Amat and More* (Ehrlich, 1985) to learn the original motivations for the expressions we use.[12]

Another aspect that affects transparency is the fact that the form can also be reduced due to its predictability, as with *God be with ye* being reduced to *Goodbye.*

4.   How the grammars of languages differ

Each language has its own history of development, and so each language is unique. The cognitive categories manifested by the language will be unique to that language (even translation equivalents will differ in terms of the prototype of the category and in terms of the items or phenomena that the expression can be used for).[13] In the process of trying to communicate, the speakers of each language will, according to what they think is important to get across to the addressee, constrain different aspects of the inferential process of the addressee, and even if they constrain the same semantic domain as speakers of other languages, they may constrain it to different degrees, and may do so with different formal means. Languages, or, more correctly, the constructions of languages, then can differ in three ways:

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11.   *RSVP* is used as a noun to mean '(make) a reservation' in Australian English, e.g. *Please note this event is now fully booked out. No further RSVPs will be taken* (announcement of an event at La Trobe University). What I am calling the image of a floppy disc is actually the image of the 3.5 inch hard shell disc that replaced the true floppy disc. The former was not floppy, but in that case we kept the name *floppy disc,* even though it was no longer motivated by the flexibility of the disc.

12.   Loss of motivation and transparency is also what motivates reinforcement and layering (see Hopper, 1991, on these phenomena).

13.   Except in the case of cultural convergence in language contact areas. See LaPolla (2009) for discussion.

Do they constrain or not constrain the interpretation of a particular semantic domain?

For example, English constrains the interpretation of the time of an action with reference to the speech act time (or some other reference point) obligatorily (i.e. it has grammaticalized tense), whereas Chinese does not. In Chinese it is possible to use adverbials and aspect marking to constrain the interpretation, but it is also possible to have an utterance as in (5a), where there is no constraint on the interpretation of the time of the action, and so it corresponds to three different possibilities in English. Notice also English constrains the interpretation of the gender of the 3rd person referent, whereas Chinese does not.

(5) a. *Tā   qù xuéxiào.*
         3.SG go school
     b. *She went to school./He went to school.*
     c. *She is going to school./He is going to school.*
     d. *She goes to school./He goes to school.*

If they constrain the interpretation of a particular domain, how much do they constrain it?

For example, English obligatorily constrains the interpretation of the time of the action to being before, at the same time as, or after the speech act time. Other languages may cut this up differently. Japanese has only past and non-past. English (and also Japanese) does not constrain the interpretation of how far in the past an action is, as pointed out in reference to Example (3) above. Rawang (a Tibeto-Burman language of northern Myanmar) also constrains temporal reference, but to a greater extent than English or Japanese, in that it requires the speaker to constrain the interpretation of how far in the past an action has happened, that is, it has four past tenses.[14]

(6) a. *àng dī á:m-ì.*
         3SG go DIR-INTR.PAST
         'S/he left, went away (within the last 2 hours).'
     b. *àng dī dár-ì.*
         3SG go TMhrs-INTR.PAST
         'S/he went (within today, but more than two hours ago).'

---

14. Data from my own fieldwork. Abbreviations used: DIR: directional adverb; INTR.PAST: intransitive past tense marker; NPAST: non-past tense marker; R/M: reflexive middle voice marker; TMdays: tense marker for actions within the past few days up to a year; TMhrs: tense marker for actions within the past few hours; TMyrs: tense marker for actions more than one year ago.

c. *àng dī ap-mì.*
3SG go TMdys-INTR.PAST
'S/he went (within the last year).'

d. *àng dì yàng-ì.*
3SG go TMyrs-INTR.PAST
'S/he went (some time a year or more ago).'

If they constrain the interpretation of a particular domain, how do they constrain it?

For example, in the Chinese utterance in (7a) there is no constraint on the interpretation of whose hair the person is washing. In English we would say *He is washing his hair,* with the interpretation of the owner of the hair obligatorily constrained by the possessive pronoun. In the Rawang example in (7c), the interpretation of the owner of the hair also is obligatorily constrained, but not by a possessive pronoun on the noun for 'hair', but by a reflexive marker on the verb.

(7) a. *Tā zài xǐ tóufa.*
3SG PROG wash hair

b. He is washing his hair.

c. *àng nī zv́l-shì-ē.*
3SG hair wash-R/M-NPAST
'S/he is washing her/his hair.'

5. Final remarks

The view I am presenting here is that the fundamental aspect of communication is not the linguistic structure, but the interaction of the speaker and hearer in performing a communicative activity. The role of the context in the performance of this activity is not to simply supplement semantic meaning; the context is the base on which all communicative activity depends. That is, rather than saying that the context constrains the interpretation of the linguistic form, I argue that it is the linguistic form that constrains the context (i.e. constrains the creation of the context of interpretation by the addressee). Culture and cognition are the fundamental organizers of experience, and so necessarily influence the construction of the context of interpretation.

As language structure is formed from repeated discourse patterns that constrain the hearer's interpretation in particular ways, it *necessarily* must be the case that those aspects that were being constrained were salient to the speaker and also assumed by the speaker to be salient or relevant to the hearer, at least in the

contexts where the pattern was used, otherwise the extra effort to constrain the interpretation in that way would not have been necessary. That is, though we give examples of the most striking connections, the point is that *all* aspects of language are determined by the culture and cognition of the speakers.

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The body, the universe, society and language

Germanic in the grip of the unknown

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The focus of this chapter is on the grammatical expression of the unknown and its role as a force for linguistic change at different times in Germanic. The paper opens with a brief look at modern Pennsylvania German, the language spoken by ultra-conservative Anabaptist groups in North America. This language has been chosen because it offers such clear evidence of a modern Germanic language whose structural features have been shaped by the cultural preoccupations of its speakers. The second part of the paper shifts focus to the grammatical coding of human experiencers in early Germanic, in particular Anglo-Saxon and early Dutch. Here it is argued that the predilection for dative and accusative marked participants during these early times was an enactment of prevailing thinking – specifically, beliefs about the human condition that emphasized its vulnerability to external forces.

1. Introduction[1]

The relationship between what the eye sees, what the mind thinks, and language is an area that is fascinating to most people, and yet it has received comparatively little scholarly attention over the years. In fact, it would be true to say that many in

linguistics have steered well clear of the topic; while they might agree there is some sort of relationship, they are unwilling to stick their necks out further than this. However, the articles in this volume clearly show the extent to which our group personalities are reflected in the languages we speak, and some of the most interesting illustrations involve the grammar – those aspects of language that are more than skin deep, or 'tongue deep', as Deutscher (2010) might describe it.

The spotlight here is on the grammatical expression of the unknown and its role as a force for linguistic change at different times in Germanic. The paper opens with a brief look at modern Pennsylvania German, the language spoken by ultra-conservative Anabaptist groups (principally, the Mennonites and Amish) in North America. This language has been chosen precisely because it offers such clear evidence of a modern Germanic language whose structural features have been shaped by the cultural preoccupations of its speakers. The second part of the paper shifts focus to the grammatical coding of human experiencers in early Germanic, in particular Anglo-Saxon and early Dutch. Here it is argued that the predilection for dative and accusative marked participants during these early times was an enactment of prevailing thinking – specifically, beliefs about the human condition that emphasized its vulnerability to external forces.

2.   Modern Germanic in the grip of the unknown

Elsewhere I have written extensively on the Anabaptist groups and their Pennsylvania German language (PG), specifically the Old Order Mennonites in Ontario Canada, a group I have been working with since 1986 (for socio-historical details see Burridge, 2002, 2007). As background to this current paper, I need only to point out that the PG-speaking community represents (1) a religious body, with the Anabaptist religion as the spiritual idea existing in the minds of people; (2) a distinct ethnic group, with Swiss and southern German origins reflected still in their unique dress and dialect; (3) a discrete cultural minority, with culture as the 'group personality' of the Pennsylvania Germans and also the public expression of that personality. The Old Order Mennonites of Canada are all three, and language is intimately bound up in all of them.

As emphasized in the descriptions by sociologists such as Fretz (1989) on the Mennonites and Hostetler (1980) on the Amish, we are dealing here with a religion that places considerable demands on the everyday living of its followers. Every aspect of the Old Order life style is saturated with symbols that express a deep commitment to community and qualities such as frugality, parity, meekness, anti-individualism and a preparedness to submit to the will of God. Indications of this commitment include their plain style of dress (which for some groups might

even stipulate the use of hook-and-eye closures in place of the more fashionable buttons), their horse and buggy (with or without rubber tyres) and their rejection of modern conveniences. Specifically, there are three aspects of the Mennonite/Amish way of life and religion that are relevant here – their separateness, their doctrine of non-conformity and, most importantly, their humility. This speech community has from the beginning emphasized rigid separation from the world and through mutual self-help and through economic, social and spiritual self-reliance, they have been able to achieve this. Their nonconformist behaviour is an integral part of this isolationist philosophy. Their shared language, like their shared dress and horse and buggy, is indispensable to their social structure – for these Old Orders, losing any of these social symbols would be the same as losing essential elements of their faith. Moreover, with High German as the word of God, the language of their scriptures, the PG they speak is seen as an appropriate symbol of their humility. Hence, the low status of this dialect variety has a positive, even sacred, value for these speakers.

The connection between vocabulary and culture is often commented on by bilingual PG-English speakers. An important word in PG is *freindschaft,* which only inadequately translates into English as 'family' or 'relations' – there is no equivalent word in English to express what is both at the same time a solidarity and kinship network within the community. Beyond the purely lexical level, Mennonite values find expression in the pronominal and nominal address system – there are no available styles of naming and addressing to express deference and attribute power or prestige. Also significant is the role of silence. There is silent prayer, tolerance of long between-turn silences, and also patterns of 'pleases', 'thankyous', greetings and leave-takings where silence is commonplace. There is often quiet at the dinner table when food is being passed around, and even a visit can consist of almost complete silence. The notion of *phatic communication*, in other words, the kind of mandatory speech used to establish social rapport during an encounter, has no value in such an integrated community, where people are deeply involved with one another and where there is no social distance. Basically, if you are speaking PG to someone you probably know that person personally. Besides, with so many external symbols, like distinctive clothing, an individual's social characteristics and values are always immediately obvious. There is not the same need for language to express this information as there is in the more mainstream culture, because these things can be taken for granted.

The above examples are illustrations of linguistic patterns whose links to culture are very apparent. More interesting are the aspects of PG grammar where the cultural traits of speakers work to influence their language in more subtle and unexpected ways.

3.   Changes in PG grammar as enactments of the Anabaptist worldview

Over the last twenty years, studies have been highlighting the extent to which repetition in conversation shapes people's linguistic behaviour. One example is the role that frequency effects play in the conventionalization of grammatical-ized morphemes. As Traugott & Heine (1991, p. 5) once put it, "discourse uses lexical items in ways that endow them with pragmatic meaning, and if they have the properties salient to grammaticalization […] and are used more frequently, they may well come to be syntacticized." Discourse presupposes the lexicon, but it is the cultural values and beliefs of speakers that give rise to many of the linguistic habits of their daily discourse – and so it is that the cultural hang-ups of these speakers can work to sculpt the structures within their grammar (see also LaPolla, 2003, and this volume, on the development of grammar out of the repetition of discourse patterns).

In Burridge (2002) I discuss two unusual grammatical developments that appear to have been shaped by Mennonite 'self-image'. I will briefly revisit these here in order to set the scene for a third change involving the evolution of a new complementizer *fer*.

3.1   The grammaticalization of *zehle*: From 'counting' to 'predicting'

The shift of the lexical verb *zehle* 'to count' into a marker of future time *zehle* (or *zelle* with a short vowel for some speakers) is a curious development precisely because it does not fit into any of the grammaticalization schemas that have previously been identified (see Bybee, Perkins, & Pagliuca, 1994).

(1)   *Es zehlt/zellt gedanst waerre*
      it   FUT   danced be
      'There will be dancing' (compare *Er zehlt finf kieh* 'he counts five cows')

While a verb of counting, which has such specific semantics and accordingly restricted contexts of use, is an unlikely source for the creation of future meaning, it is possible to reconstruct a plausible scenario for the change, with inferential reasoning as a stimulus for semantic transfers at each stage (Bybee et al., 1994; Traugott, 1989; Traugott & König, 1991; LaPolla, 2003):

> (1) 'count (numerically)' > (2) 'calculate'/'estimate' > (3) 'make the basis for one's calculation'/'plan' (cp. English *count on*) > (4) 'intend' > (5) 'predict'

When a speaker is making arrangements (stage 3), a hearer might well infer that this person intends to carry out the proposed plan of action. From this we arrive at intention (compare *reckon,* which in some English dialects has come to mean 'to intend'; e.g. *I reckon to leave next week*). An expression of intention (stage 4) would

imply that, all being well, the plan will be carried out, and with explicit coding of this inference, we arrive at a marker of pure future. You might also compare similar semantic shifts undergone by English parenthetical *I reckon* and even related verbs such as *tell, figure* and *count*. All are showing a loss of semantic complexity and shift to increased abstraction. And yet, the PG verb has gone that extra step along the grammaticalization path towards auxiliarihood – why?

Only a description that takes account of the Anabaptist belief and value system can make sense of this transfer of meaning from 'counting on a future happening' to 'predicting a future happening.' The strong mental reservation that PG speakers have about discussing the future has triggered the loss of the inherited future auxiliary and established in its place an impressive array of tentative future time expressions, all well suited to a cultural script that emphasizes subordination of individual will to the will of God. Interestingly, all are calques of English constructions. The following are just some examples:

(2)   *Ich figger schwetze*
      'I figure on speaking'

(3)   *Ich bin am plaenne fer schwetze*
      'I plan on speaking'

(4)   *Ich bin supposed fer schwetze*
      'I'm supposed to speak'

(5)   *Ich zehl/zell schwetze*
      'I am counting on speaking/I will speak'

Such tentative expressions of future time, as (2)–(5), are made-to-measure for this group of speakers and all are potential future markers in the language. Nonetheless, it was *zehle* that happened to be the most frequent, and routine use sealed its fate as an auxiliary verb.

3.2   The degrammaticalization of *wotte* from subjunctive modal to 'desire'

PG appears to offer a bona fide example of degrammaticalization, whereby a grammaticalized modal verb (equivalent to English *would*) has sprouted two pronunciations *wotte* and *wette*, one of which has re-evolved into a full-grown lexical verb *wotte* 'to wish' (illustrated in 6).

(6)   a.   *Ich wett   sell   net   duh*
           I   would that   not   do
           'I wouldn't do that'

      b.   *Wott   net   fer   sell*
           wish   not   for   that
           'Don't wish for that'

    c.   *Ich wott du kennscht frieher kumme*
       I   wish you could   earlier come
       'I wish you could come earlier'

Although originally a preterite subjunctive form of the modal *welle* (cognate with English *will*), *wotte* has now re-acquired all the trappings of a lexical verb; e.g. it can no longer take bare infinitival complements (as modal *wette* illustrates in 6a), and subject reference identity is no longer a requirement (as shown in 6c). Its shift from modal to fully-fledged verb has been towards decreasing grammatical expression; it has seen an enrichment of semantic substance and a return of precisely those morphosyntactic properties that were lost when *wotte* became a modal verb.

    The seeds for this development were sown in the pragmatic use of the preterite subjunctive to convey reserve or reluctance on the part of the speaker; in particular, those contexts where originally preterite subjunctive *wotte* was used as a cautious and moderate substitute for the indicative in utterances expressing a sense of 'wishing.' Consider the Standard German use of the past subjunctive in sentences like (7) below. Here the unreality conveyed by the subjunctive can indicate that the speaker is not counting on the wish being fulfilled. In his 1904 grammar, Curme appropriately dubbed this 'the subjunctive of modest wish':

(7)   *Ich **wollte**,*   *ich wäre zu Hause*
       I   wish(PRET.SUBJ) I   were at home
       'I wish I were home' (see Curme, 1904 [1970], p. 228 and
       Durrell, 1991, p. 344)

For speakers uncomfortable with blunt expressions of desire or will, it is not surprising that *winsche,* the original verb of 'wishing' and 'desiring', has all but disappeared and in its place we find a new verb whose origins lie in 'the subjunctive of the modest wish'.

    Such tempering of expressions of desire is most certainly not confined to the Pennsylvania Germans. The original modal verb itself (PG *welle*, Standard German *wollen* and English *will*) has an optative source, which already in Proto-Germanic had the function of an indicative. As Hermann Paul observed, Germanic conversational practice saw the wish form prevail all those years back:

> Seit alters wird der Indikativ Präsens dieses Verbs durch Optativformen gebildet, weil die Wunschform in der Rede vorherrschte (Paul, Mose, Schröbler, & Grosse, 1982, p. 219)

> [From time immemorial, the indicative present of this verb was constructed out of the optative form, because the wish form predominated in speech]

3.3   The rise of *fer* 'for' in purposive complement clauses

As a third, and final example from PG, I want to suggest that queasiness about the future is also one of the forces behind the recent and very rapid expansion of what was an originally purposive 'for-to' infinitive construction in the language, more specifically, the generalization of *fer* that has in a remarkably short period of time replaced the older complementizer *zu* (for an outline of the grammatical changes, see Böjars & Burridge, 2011).[2] The path of development can be outlined as the following:

> Stage 1.   *zu* 'to' + infinitive
> Stage 2.   *fer…zu* 'for to' + infinitive
> Stage 3.   *fer* 'for' + infinitive

Only Stage 3 is possible now, though as I will describe later there are vestiges of Stage 1 in Modern PG:

(8)   a.   *No*   hot   sie   so   hatt   browiert   alles   sauwer **zu** halde
              then   has   she   so   hard   tried   everything   clean   to   keep

      b.   *No*   hot   sie   so   hatt   browiert   **fer**   alles   sauwer **zu** halde
              then   has   she   so   hard   tried   for   everything   clean   to   keep

      c.   *No*   hot   sie   so   hatt   browiert   **fer**   alles   sauwer   halde
              then   has   she   so   hard   tried   for   everything   clean   keep
              'Then she tried so hard to keep everything clean.'

The spread of *fer-zu* clauses from adjunct of purpose to subject and complement functions is common to a number of varieties of Germanic; 'for-to' purposives appear in some continental German dialects, including Frankish (Lockwood, 1968, p. 154) and Pfälzisch (Henn, 1980). Only Luxemburgish has a *fir-ze* construction that is showing some expansion from adjuncts of purpose to general complementation (Bruch, 1973, pp. 102–104; Christophory, 1974, p. 93). However, in PG this change has taken place at the same time as a related and very pervasive change in the language (and one that appears to be unique within Germanic), and this is the loss of the infinitival marker *zu*.

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2.   Where not specified, examples here come from natural conversational data. If examples are elicited, this is indicated. The speakers recorded for this study grew up as monolinguals until the age of about six, when they started school. Included are both Old Orders and Markham Mennonites (sometimes called the *Modern Plain* because they have accommodated more to modern ways).

There is much that is not surprising about this development. The historical path from allative or benefactive to purposive to infinitival marker is typologically widespread (see examples in Haspelmath, 1989, pp. 293–295). The purposive meaning desemanticizes and a new marker is drafted in to compensate for its gradual disappearance. An existing benefactive or allative preposition is a common option due to the semantic connection. The purposive meaning of this new marker can in turn weaken, leading to the need for reinforcement. In earlier stages of German, the allative preposition *zu* had come to be used as a marker of purpose; it was certainly used in this way in Old High German. By the stage of Middle High German, *zu* was spreading to complement clauses. At some stage, it lost its purposive meaning and a fresh marker was required to distinguish the purposive from other clauses. In most dialects, *um* took on this role and this use remains in Standard German today. The dialects from which PG developed opted for the benefactive preposition *fer* instead. The development from a benefactive marker that combines with a noun phrase to a purposive marker combining with a clause is typologically common. Indeed, Poutsma (1923) and more recently Miller (2002, p. 188) argue that the Old English bare infinitive ending in *-an* originally had a purposive meaning, which was weakened enough for it to be reinforced by *to*, which in turn was semantically weakened and reinforced in purposive environments by *for*. After the wane of *for* as a purposive marker, Modern English now uses *in order to* as a dedicated purposive marker. In Böjars & Burridge (2011, p. 409), we describe this as a kind of "Jespersenian cycle of purposive".

So far all is straightforward. However, there are at least two puzzling aspects to the development of PG. Firstly, the spread of the construction to complement clauses and the accompanying disappearance of *zu* are innovations that are not attested in any other Germanic variety and remain peculiar to PG. The question then is, as Weinreich, Labov, & Herzog (1968, p. 102) have expressed it: "why do changes in a structural feature take place in a particular language at a given time, but not in other languages with the same feature, or in the same language at other times?" The second puzzling aspect has to do with the speed of this change. The modern language shows no trace of *fer-zu* clauses, and *fer* has replaced *zu* in all but a few relic constructions (outlined below). However, clauses with both *zu* and *fer...zu* complementizers (Stages 1 and 2) regularly appeared in the language until relatively recently, as evident in the autobiography of former Old Order Mennonite Alan Buehler (written in the 1970s), and others of his works (note, the spelling *tsoo* and *fawah tsoo* is Buehler's):

(9)   a.   *Dah gasoline engine huhd yehts awfahgnah **tsoo***
           the   gasoline engine   has   now   begun   to

           gahbrowcht vairah.
           used   be

           'The gasoline engine now began to be used.' (Buehler, 1977, p. 95)

b. *Noh huhd see aw   mie notebooch gahvisah,*
    then has   she also my   notebook   shown

   fawah *mich* **tsoo** *shehmah.*
   for   me   to   shame

   'Then she also showed my notebook to shame me.'
   (Buehler, 1977, p. 80)

Even allowing for the fact that Buehler was an older speaker, the change has been remarkably fast compared to the normally glacial speed of grammar creation. For example, the marker *to* in English started to extend from purposive to complement functions as early as the Old English period, but even into the 1500s *to* was still competing with the bare infinitive.[3] In PG, the cycle has been completed within about 200 to 300 years.

The clues to understanding these puzzles lie in those relic constructions in Modern PG that retain traces of the old infinitive marker *zu* (beyond fixed expressions such as *nix zu duh* 'nothing to do'). Some (usually older) speakers can occasionally use both single *zu* and single *fer* to introduce non-finite clauses, but there are semantic associations with the two constructions. It is apparent that *fer* and *zu* differ in the degree of confidence in the projected outcome; typically speakers prefer *fer* when the event in the non-finite clause is less certain. This difference between *zu* and *fer* parallels the difference between *for-to* and *to* in English, as described by linguists as varied as Jespersen (1927), Dixon (2005), Wierzbicka (1988) and Bresnan (1979). Compare examples such as *I'd hate for you to do this* and *I'd hate you to do this*. While both are future oriented, *to* has firmer expectations of effectiveness – or as Wierzbicka (1988, p. 120) neatly puts it, the "for-to versions sound more helpless and less confident."

Semantic differences of this kind are not always apparent when taken out of context, but a particular context can influence the choice in a significant way. For example, when presented with the isolated sentence *I have thirty cows to milk*, most PG speakers appear in agreement that a translation with either *zu* or *fer* is possible. However, when more background is provided, clear preferences emerge. If, say, speakers are presented with a scenario where they are assumed to be in the middle of milking already and are explaining that they have thirty more cows to milk before being done with chores, then overwhelmingly they produce the sentence in (10) with *zu*. On the other hand, if it is explained that they have just met someone for the first time and are giving an account of farm life, including the fact

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3. As Visser (1963, § 901) concludes, "it took a long time for the particle *to* to be reduced from a preposition expressing motion, direction […] to a semantically empty sandhi form, functioning as a mere sign of the infinitive."

that there are thirty cows to be milked every day, they are more likely to produce (10) with *fer*.

(10)   a.   *Ich   hab   thirty   kieh   zu   melge*
       b.   *Ich   hab   thirty   kieh   fer   melge*
            I   have   thirty   cows   to/for   milk
            'I have thirty cows to milk' (elicited)

The event of milking the cows in the first situation is associated with the immediate future – some cows had just been milked and another thirty were about to be. The orientation in the second situation, however, is less time specific; the speaker is making a more general statement about the task of milking cows on the farm.

Different expectations of effectiveness also show up where the responsibility for the outcome falls to the first person as opposed to some other person. In translation tasks, it is striking that when the event is other-oriented speakers prefer *fer*, but when it is self-oriented (and presumably there is more confidence about the outcome), they produce *zu*.

(11)   *Ich   hab   thirty   kieh   zu melge   un   hab   zwee   man   fer   mich   helfe.*
        I   have   thirty   cows   to milk   and   have   two   men   for   me   help
       'I have thirty cows to milk and have two hired men to help me.' (elicited)

If we consider the original meaning of the two elements, this semantic tendency is not surprising: *zu* is in origin an allative preposition where the meaning direction in space has been extended to direction in time; *fer* as an infinitival marker has developed from a benefactive via a purposive. Though purpose implies a degree of futurity, it is not as direct – it is a consequence of the fact that a purpose may be realized in the future. This kind of persistence in meaning is common in grammaticalization (e.g. Hopper, 1991). Hence, it is not surprising that for those speakers who allow both *zu* and *fer*, we find *zu* associated with a more immediate future.

For those who have lost *zu*, however, only two options remain: bare infinitives or *fer* constructions. Verbs for which there is a clear implication of simultaneity between the higher and the lower verb have a bare infinitival complement; examples are constructions involving modals, verbs of movement and of perception, where the implied simultaneity is simply not compatible with the future orientation of either *fer* or *zu* (see 12). By contrast those verbs whose meanings imply futurity with respect to the lower verb take *fer*, as in (13).

(12)   a.   *Ich   hab's   kind   ghaert   heile*
            I   have-the   child   heard   cry
            'I heard the child crying.' (elicited)
       b.   **Ich hab's kind ghaert **fer/zu** heile.*

(13) *Ich hab ien   verschwetzt **fer** geh*
      I   have him persuaded   for go
      'I persuaded him to go.' (elicited)

There are a few environments, however, in which there is a choice between a bare infinitive and a *fer* infinitive. Some verbs generally take a bare infinitive, but a *fer* complement can be used where a context removes the simultaneity associated with the higher verb. The verb *gleiche* 'to like' prefers a bare infinitive – the enjoyment expressed by *gleiche* can be said to coincide with the activity expressed by its complement clause, as in (14) (the *zu* here is a preposition introducing the prepositional phrase *zu leit* 'to people'). However in (14), the context implies futurity between the liking and the meaning of the lower verb. In this case, *fer* is possible, though not obligatory. As the idiomatic translation shows, this parallels the English alternation between *-ing* and *to*-infinitives (see also Halliday, 1994, Chapter 7 on the semantics of the clause complex).

(14) a. *Ich gleich zu leit   schwetze*
         I   like   to people talk
         'I like talking to people.'

      b. *Deedscht du   gleiche **fer** en teacher sei een daag*
         would   you like   for a   teacher be one day
         'Would you like to be a teacher one day?' (elicited)

Such appearances of the more hypothetically orientated *fer* clauses are more acceptable to speakers where the higher clause contains a subjunctive, as in (14) and (15) below.

(15) *Ich really deed   gleiche **fer** e tiescher sei*
      I   really would like   for a teacher be
      'I would really like to be a teacher.' (elicited)

In the following sentences, however, the enjoyment coincides with the activity and *fer* clauses are not found; (17) was only marginally acceptable to speakers, despite a future component in the complement clause. Like (15) it refers to an unrealized activity, but it differs in the nature of the event in the complement clause. Example (15) is a wistful thought – the modifier *really* adds to the sense of a yearning. The outcome may never eventuate and is certainly less assured than the possibility of a cup of coffee.

(16) *Ich gleich   kaffee   drinke*
      I   like   coffee   drink
      'I like drinking coffee.' (elicited)

(17) ?*Ich deed   gleiche **fer** e kobli kaffee hawwe*
      I   would like   for a cup   coffee have
      'I would really like to have a cup of coffee.' (elicited)

There are also other, more subtle semantic differences that influence the choice between bare infinitive and *fer* infinitive. Some of these effects are comparable to those noticed in English usage by Wierzbicka (1988) and an explanation along similar lines appears appealing. However, this is not the place to go into further details. Suffice to give one final illustration here of the tentativeness of *fer*. Consider the lexical complements of the verbs given in (18); each of the *fer* versions clearly expresses less confidence in the outcome.

(18)   a.   *Sie   verwart/ekspekt/will/foddert/bestellt   en   brief*
            she   awaits/expects/wants/demands/orders   a   letter
            'She awaits/expects/wants/demands/orders a letter' (elicited)

       b.   *Sie   wart/hofft/wott/froogt/beddelt **fer**   en   brief*
            she   waits/hopes/wishes/asks/begs   for   a   letter
            'She waits for/hopes for/wishes for/asks for /begs for a letter' (elicited)

It is interesting to see how the English translations parallel exactly these differences. As Wierzbicka (1988, p. 120) points out, the semantic nature of the main verbs here is determining the complement; she compares 'non-confident' English verbs such as *ask for* and *long for* with 'confident' ones such as *demand* and *order* that never allow *for* (**demand for/*order for*).

   If grammar emerges from the fixing of favoured discourse patterns, then it is not difficult to see how in a belief system that so totally subordinates self-will and self-love to the will of God, tentative *fer-zu* (and eventually single *fer*) would be preferred over the more confident *zu* construction. So while the shift from *zu* to *fer* is a paradigm example of the twin processes of reanalysis and analogy at work, it is extra-linguistic factors that create the conditions for the prominence and ensuing conventionalization of *fer*. These are the factors that can account for why it is that PG and no other modern Germanic language has undergone such rapid turnover of complementizers.

4.   The speed of changes in PG grammar

All three examples of grammatical change discussed above have taken place remarkably quickly, and there is another way in which social context has an accelerating influence. In a paper on the creation of conjunctions in dialects in East Anglia, Trudgill (1995) argues that the rapid processes of grammaticalization here are related to the size and complexity of the speech community.

> Listeners who are operating in a familiar environment in interaction with speakers whose language or dialect they are familiar with, with whom they are well acquainted, with whom they interact frequently and with whom they share a large fund of common knowledge, can make do with less phonetic and semantic information than listeners who are less familiar with the situation, the topic and other interlocutors.   (Trudgill, 1995, p. 144)

How tightly knit a community is will not only influence the phonetics of the language or dialect but also certain types of grammatical change. Fast-speech phenomena arise from the reduced need for elaboration in these communities due to the considerable degree of shared ground. This leads to phonological reduction, which in turn feeds the development of new grammatical structures. The tendency for general reduction and omission of unstressed material is a striking feature of PG and, while this would be expected of any spoken language without a written form, it is also the consequence of the closely integrated speech community (as Enninger (1985, p. 255) describes it: "intra-group interaction is performed in the solidarity network of brethren and sisters which is at the same time a kinship network of close to distant relatives, i.e. *die freindschaft*"). True, tightknit communities have long been linked with linguistic stability, but as Trudgill (2011, this volume) more recently shows, small speech communities with tight social networks "are more able, because of their network structures, to push through, enforce, and sustain linguistic changes which would have a much smaller chance of success in larger, more fluid communities – namely, changes of a relatively marked, complex type" (p. 103).

5.   Early Germanic in the grip of the unknown

We now switch focus to early Germanic, in particular Old English (10th and 11th centuries) and Middle Dutch (14th and 15th centuries, specifically Brabantish, the dialect of the southern medieval duchy of Brabant, and Hollandish, the dialect of the former province of Holland). Documentary evidence for Dutch begins only in the late medieval period – material from so-called Old Dutch (or Old Low Franconian) is best represented by a 10th century interlinear psalm translation (the *Wachtendonckse Psalmen*) and is therefore little use for the analysis of grammar. All early English and Dutch examples are taken from a range of medical and medico-magic texts as detailed in the bibliography. These texts have a number of advantages. For one, they are free of literary ambition and resemble as closely as possible the spoken idiom for the period in question (Burridge, 1993). They also offer a very different view of early speech communities. A collection of Old English leechdom "remedies", for example, resembles a kind of Anglo-Saxon first aid kit. The picture of the culture these accounts present is very different from that given by the highly stylized remains of Anglo-Saxon literature (such as the Lindisfarne Gospels, or the poems now known as *Beowulf* and *Cædom's Hymn*), or other outstanding pieces written by known elites such as Ælfric. As medical historian Charles Singer writes in the introduction to *Anglo-Saxon Magic and Medicine*, these leechdoms give us "a peep into a darker, a more barbarous […] aspect of Anglo-Saxon society […] and this dark side has to be considered if the truth is to

be told of the life of a people" (Grattan & Singer, 1952, pp. xix–xx). With every-thing from hangover cures and advice for the removal of unwanted hair to rem-edies against monstrous nocturnal visitors and the bites of mad dogs, we gain rare glimpses of the needs, the desires and the obsessions of ordinary Anglo-Saxons. It stands to reason that these texts might well shed a different light on some of the grammatical features of the languages of this period.

6.   Experiencing illness

It is important to emphasize here the extent to which medical opinion at this time stressed the vulnerability of the body to external forces. As any narrative history of medicine reveals, acute fear and superstition were attached to illness and disease. It did not help that early treatments were often fearsome and that few available remedies were effective. Physicians had little knowledge of anatomy and physiology and none of today's sophisticated instruments to guide them. It is only relatively recently that the mystery surrounding the aetiology of disease has been lifted. In these darks times, the dearth of knowledge concerning bodily organs, their pro-cesses and their pathological changes produced exotic medical doctrines built upon imagination and superstition. Typically, explanations for sickness connected the complaint with the workings of malevolent spirits or with divine punishment for sins committed. Epidemics were believed to be retribution for the indiscretions of entire communities. These Anglo-Saxon and Middle Dutch texts flourished with descriptions of assaults by supernatural beings and with constant reminders of the threat from fiends such as the *niht gengan* 'night visitors' and *on-fliers* 'flying ven-oms.' Hoards of more minor malicious sprits (such as dwarfs, elves and fairies) were believed to haunt the landscape, bringing with them misery and disease. As often as not, cures took the form of appeals for clemency to those higher powers believed responsible, as people resorted to prayers, incantations, sacrifices and sorcery; notions of healing might also invoke astral influences (favourable planetary and stellar influences). Even post-Renaissance therapeutics in Europe was still showing a curious mixture of Christian theology and the superstitions of pagan antiquity.

When disorders were understood to be caused by something within the body itself, the triggers were assumed to be some external force (perhaps food eaten or a preparation applied). According to the medieval theory of the humours, such events were usually ascribed to the quality and varying mixtures of the patient's four humours – the key to good health was to keep these in balance.[4] Nonetheless,

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4.   To be fair, in their own context such doctrines did not appear as absurd as they do from today's perspective; in many cases, simple faith in the ritual may well have been enough to

disease was generally thought of as something mysterious and supernatural, and in all events, the body was very much a passive undergoer. An overwhelming sense of extra-human agency is conveyed in the images of the time given on the next page. For example, *Wound Man* is a kind of early first aid chart, showing the possible injuries a 'leech' might have to treat during his career; *Zodiac Man* informs practitioners of the astrological signs that influenced the various parts of the body and therefore determined the propitious time for treating ailments; and vegetation images such as *Tree Man* show the human body firmly planted in, and under attack, from nature.

Descriptions of illnesses and other 'accidents' of the body offer some of the best illustrations of the passive role of body and person caught up in processes and states believed to be controlled by outside forces; see Wierzbicka's portrayal of 'the unknown' in syntax (Wierzbicka, 1979, pp. 369–377; see also Burridge, 1993, 1996). In the medico-magical texts of both Old English (OE) and Middle Dutch (MD), we see an exuberance of predicates taking non-nominative subjects, many of which fall outside those that have traditionally been identified.

6.1   The impersonal verb construction and its variants

The so-called impersonal construction is an extreme example of this experiential-coding grammar – the lack of nominative case marking and verb agreement emphasized that there was no agent and often also no conceivable cause for the event or the process. All arguments were oblique (dative or accusative) and the verb itself stood in the third person singular, regardless of the number or person of its arguments (see the traditional account by van der Gaaf, 1904).

This is the characteristic that earns it the description 'impersonal' (cp. the classic *me-thinks* construction in early English).[5] In Visser (1963) and especially Allen (1995), we see just how complex constructions with non-nominative subjects could get in early Germanic; however, the following examples are usually taken to illustrate the canonical grammar for impersonal verb constructions:[6]

(19) **þam   mannum   gelimpð   þe   on miclum gedrence** […]
      the.DAT.PL men.DAT.PL happen-3SG who on much   drinking
      'It happens to men who in much continued drinking […]' (OE)

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effect a cure – and, as Bob Dinapoli has pointed out to me, most of us today believe in the workings of microbes on about as much evidence as the medievals had for humoralism!

5.   I do not include here the weather constructions (*it rains* etc.), which traditionally have also been placed under the label *impersonal*.

6.   The glosses I provide are not complete, but offer just enough grammatical detail to support the arguments being put forward.

(20) **hem**   *dunct*   *datter*   *engheen ghewin aen en leghet*
him.DAT.SG think-3SG that-there no   gain   on   not lies
'It seems to him that there is no gain in it' (MD)

The use of the non-nominative for arguments of impersonal verbs has long been pointed out as a device for signalling entities "unvolitionally/unself-controllably involved in the situation" (McCawley, 1976, p. 194 about Old English). Hence, the construction involved verbs of needs, happenstance, obligations, and also physical, mental and emotional experience. They have been dubbed impersonal verbs,
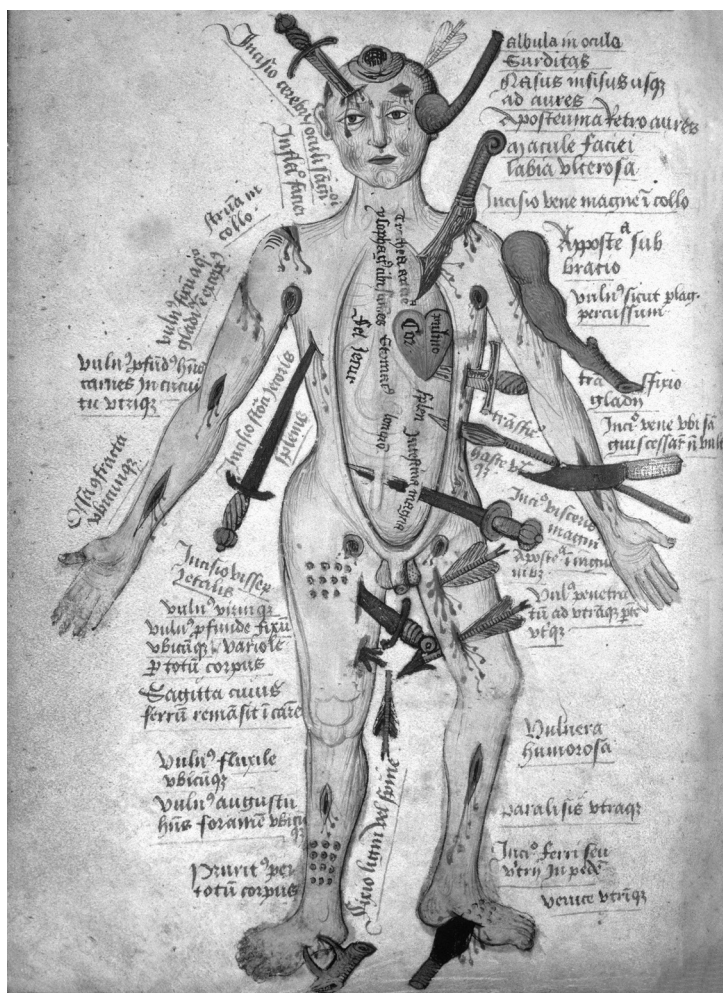
Figure 1. 'Wound Man', from Claudius Galen, *Anathomia*, mid 15th century (Wellcome Library, London, image L0013467)
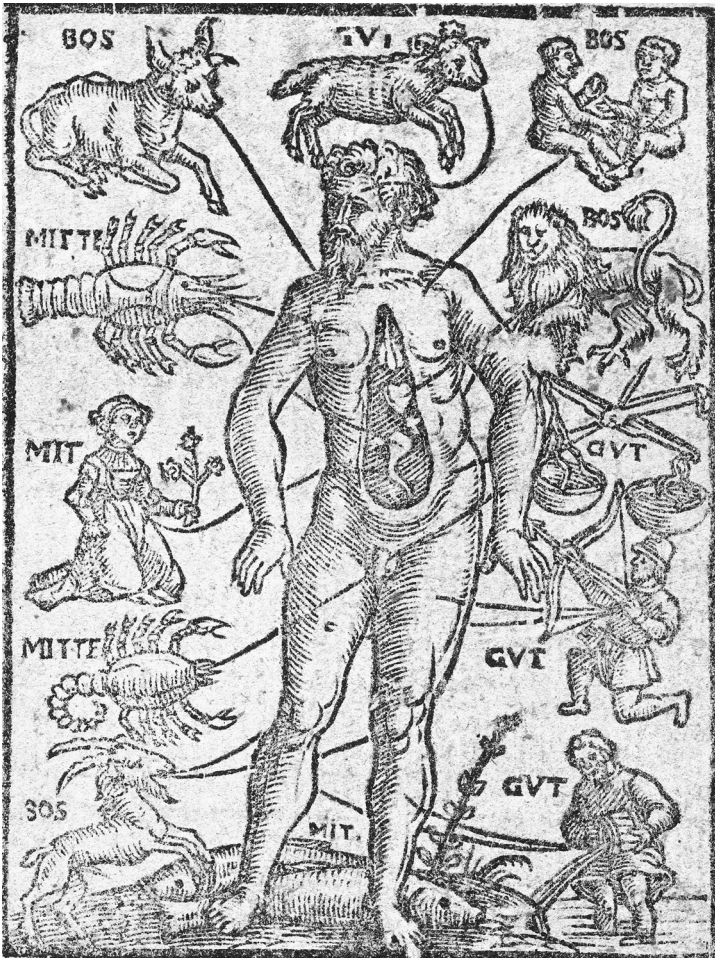
Figure 2. 'Zodiac Man', from Petrus. Slovacius. (1580). *Allmanach auff das 1581 jar*. Breslau: Johan Scharffenberg (Wellcome Library, London, image L0031517)

though this description better suits the construction itself, as should become apparent below.

The medical texts also contain a variety of other related experiencer constructions. For example, mainstream experiencer verbs occasionally appeared with nominative subjects (rather than the expected oblique) and oblique subjects could show verb agreement. These phenomena are not unknown in the linguistics literature; indeed they are often cited as evidence for the disappearance of the impersonal construction – with the reanalysis of the non-nominative noun phrases as subjects assumed to be triggered by the dual forces of a disintegrating case system and the stabilizing of SVO constituent order (see van der Gaaf, 1904
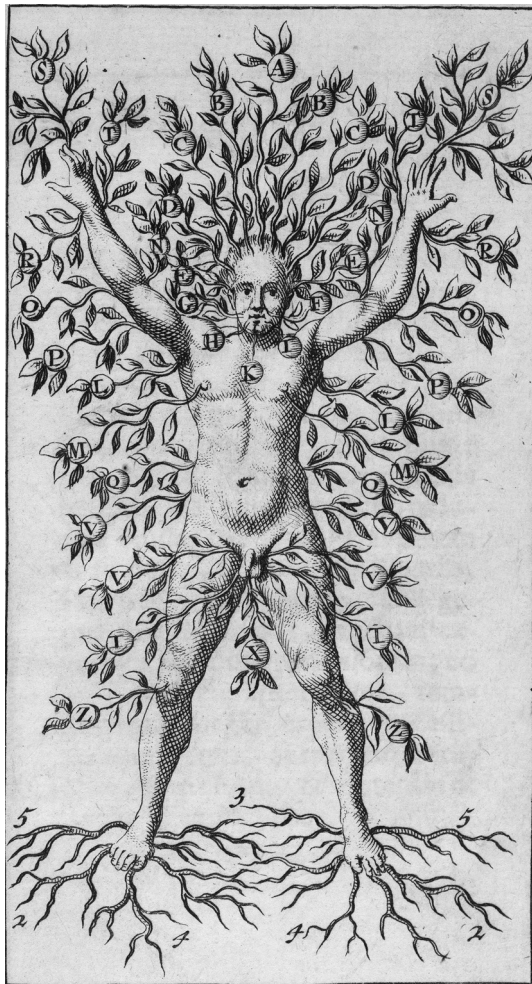
Figure 3. 'Tree Man', from s.n. (1969). *Compendium anatomicum nova methodo institutum.* Amsterdam: Georgium Gallet (Wellcome Library, London, image L0074579)

and Jespersen, 1927 on English). I will discuss later, however, that there are some obvious problems with this account.

Moreover, another way of viewing this metamorphosis of impersonal to personal is to assume that nominative constructions were not a later introduction to rival the oblique but were always an option. In other words, verbs vied for non-nominative and also nominative subjects, and in the latter case they behaved just like personal verbs. Revealing in this regard are the two Middle Dutch sentences below:

(21) a. ***hem   walght***
          he-DAT vomits

     b.   ***hij***   *walght*
           he-NOM vomits
           'He vomits' (MD)

The verb *walghen* 'to vomit' is not among the mainstream psychological or experiencer predicates, and yet a sentence like *hem walght* is indistinguishable from a recognized impersonal construction like *hem dunct* given in (20). Moreover, the activity suggested by *walghen* is, like any bodily function, not something over which we have a lot of control and the use of the dative here reflects this. Sentence (a) is simply semantically more marked than (b) by capturing this fact. In the Middle Dutch texts, the (a) version was more usual when the vomiting was the result of some sickness. The nominative subject *hij* (as in 21b) appeared when the cause of the vomiting was known; for example, the vomiting might have been deliberately induced by giving the patient something that the Anglo-Saxon *leeches* called a *spiwdrenc* 'spew drink'. Similar alternations can be found in the remnants (or in the case of Modern English, the reinventions) of the earlier dative-coded constructions in the modern Germanic languages: compare variants such as German *er* (nominative) versus *ihm* (dative) *träumt* 'he dreams' and Modern English *I worry* versus *it worries me*.

    Admittedly, it is often not obvious why we find this sort of fluctuation in texts; both constructions illustrated in (22) and (23) were commonplace in the Old English leechdoms.

(22)   *him*   *biþ sona sel*
        him-DAT be   soon better
        'He will be better straight away' (OE)

(23)   […] *oþþæt he*   *hal sy*
            until   he-NOM well be
        '[…] until he is well' (OE)

For us in the 21st century, it is often difficult to determine how writers and readers of the time perceived such sentences (the same point is made by Visser, 1963, p. 30). Perhaps closer scrutiny of these leechdoms would reveal why some routinely conclude their account of the patient's treatment with a formulaic dative construction, as in (22), and others with a nominative construction, such as (23).

6.2   The construction of inalienability and its variants

The texts contain a number of other experiencer-marked constructions that are relevant here. The following Old English example comes from an exorcism of someone described as *ælfsogaþa* (lit. 'elf-sucked'); in other words, some sort of nasty affliction caused by elf-possession (which in all likelihood was anaemia). The afflicted one appears twice as a dative pronoun *him*.

(24) *Gif **him**   *biþ*   *ælfsogaþa* **him**   *beoþ* *þa*   ***eagan** geolwe*
      if   he-DAT be-3SG elfsucked he-DAT be-PL the-NOM eyes   yellow
      'If a person is elf possessed, his eyes are yellow.' (OE)

The dative in the second clause resembles the so-called *construction of inalienability*, where a possessor is coded as a separate dative argument and that which is inalienably possessed (here *þa eagan* 'the eyes') is coded with the definite article. This construction captures the special part-whole relationship that exists between body parts and their owner – in fact, not just body parts but anything which has any sort of close association with the person, such as speech, mind, hair, nails, effluviae, sores, wounds, sickness, fever, etc. (see Fox, 1981 and Chappell & McGregor, 1995). Examples (25) and (26) show how the person is defined as a central participant and the inseparable status of the body part is expressed by the preceding definite article and the lack of modifiers (at least I have uncovered no evidence of modification – though of course in the case of 'dead' languages negative occurrence can never be conclusive).

(25) *Gif **men**   **sio**   **heafodpanne** beo gehlenced* […]
      if   person-DAT the-NOM skull   be   folded
      'If someone's skull is fractured […]' (OE)

(26) *Doen querteleerde ic hem   ende ondect*
      then trepanned   I him-ACC and uncovered

      hem**   **dat hersenbecken
      him-DAT the cranium-ACC

      'Then I trepanned him and uncovered his cranium.' (MD)

The texts have a number of variants of this basic construction. In one, the possessor is doubly coded as dative object and a possessive pronoun:

(27) *Gif **men**   **his wamb** sar   sy* […]
      if   person-dat his womb sore be
      'If to a person his belly/If a person's belly be sore […]' (OE)

(28) *Als   ghi dat werct soe seldi   **den sieken***
      when you that work so shall-you the patient-DAT

      ***siin oren** stoppen met catoene*
      his ears stop   with cotton

      'When you operate that (i.e. the drill), then you shall stuff the patient's ears with cotton wool' (MD)

It stands to reason that a writer would have chosen an inalienable construction such as the above over a straightforward possessive construction (involving the genitive) to highlight the personal involvement of the possessor. Compare Examples (25) and (27) with the following:

(29) *Gif* **mannes   heafod**   *tobrocen sy* […]
      if   person-GEN cranium broken   be
      'If a person's head is broken […]' (OE)

However, while the concept of inalienable possession is relevant here, it does not adequately account for these early Germanic constructions, for it captures nothing of the rhetorical force that this dative construction had, only relics of which still survive in the modern languages.[7] The following lengthy extract from a Brabantish surgical text makes very clear the force of the dative case.

(30) *Heeft die sieke   hooft sweer   ende swimelinghe*
      has   the patient-NOM head pain-ACC and   dizziness-ACC

      ende siin oghen   worden root
      and   his   eyes-NOM become red

      ende siin aensicht   al ontsteken
      and   his   face-NOM all inflamed

      ende hi   verliest alle siin verstandenisse
      and   he-NOM loses   all   his   understanding-ACC

      ende keert   ter   kelen bitter coleren
      and   vomits thru-the throat bitter bile-ACC

      ende bi aventueren vloyt hem   tbloet
      and   by adventure   flows him-DAT the.blood.NOM

      ter   nosen ende ten   oren uut
      thru-the nose   and   thru-the ears out

      ende hem   ontvalt   siin sprake   ende -
      and   him-DAT disappears his   speech-NOM and -

            verliest siin stemme.ende   hem   siin aensicht   root is
      (he) loses   his   voice-ACC.and him-DAT his   face-NOM red is

      ende hem   die puysten   uut broddelen
      and   him-DAT the pustules-NOM out break

      ende hi sinen appotiit verliest […]
      and   he his   appetite loses

      'If the patient has head pain and dizziness and his eyes become red and his face all inflamed and he loses all his understanding and vomits bitter bile from the throat and perchance his blood flows out through his nose and his ears and his speech disappears and (he) loses his voice and his face is red and pustules break out on him and he loses his appetite […]' (MD)

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7. However, one can see how a general possessive might develop out of this construction, as has happened in a number of modern Germanic dialects, including Pennsylvania German (see Burridge, 1996 on the evolution of the dative of possession).

In this excerpt, the writer is not simply outlining each of the appalling symptoms, but is describing and focusing on what is happening to the person. The phrase *bi aventueren* 'by adventure/chance' (i.e. what comes to him, or happens without design) shows that it is all occurring beyond the person's control – and it is interesting to see that from this phrase onwards the patient is encoded as a separate dative argument. Note also that (as was usual) the dative person controls coreferential deletion here. Translating each of these unpleasant bodily events with straightforward possessive constructions (as was necessary in the loose Modern English translation) certainly loses both semantic and stylistic content. Such a translation is also not possible with the phrase concerning *puysten* 'pustules': this can only translate as something like 'pustules break out on him.'

6.3   Other oblique curiosities

The medical texts have an array of other nominative-less constructions. On occasion, body parts appeared as oblique subjects, sometimes also with their obliquely expressed body part owners.

(31)   *And   hu   **þone**   **cealdan magan**   ungeliclice*
       and   how the.ACC.SG   cold   stomach   improper

       mettas   lyste
       meats.ACC.PL   desires-3SG-SUBJ

       'And how the cold stomach may desire improper food' (OE)

(32)   *Mi   is **den buuc**   so gheladen*
       me-DAT   is the stomach-ACC/DAT   so full
       'My stomach is so full' (MD)

(33)   ***þam   lichoman   þa   ða   hæto***
       the.DAT.PL   bodies.DAT.PL   which   the heat

       medmicle   oþþe strange   þrowian […]
       moderately   or   strongly suffer

       'The bodies which suffer heat, either moderately or strongly […]' (OE)

(34)   […] *als   **den lichaem**   heet is*
            when the body-ACC/DAT hot   is
       '[…] when the body is hot' (MD)

The Old English example (31) involves impersonal *lyste* and (33) shows a kind of hanging topic with *þam lichoman* in the dative and the verb in the infinitive form; such topic-oriented constructions were commonplace in both the English and

Dutch texts. Note also that the Middle Dutch examples in (32) and (34) are not unambiguously dative or accusative (this case distinction is being neutralized for the singular during the Middle Dutch period; see Burridge, 1993); however, those examples involving plural body parts (35) are unmistakably dative.[8]

(35) *Sie heelt wel denghenen die **den voeten** dicwil swellen*
      it   heals well those   who the feet-DAT   often   swell
      'It heals well those people whose feet often swell' (MD)

Moreover, examples such as (36) involve a dialect where the dative/accusative distinction lingers longer; it unambiguously shows the dative case.

(36) *Wan **deme maghen**   vorkoldet is*
      when the stomach-DAT cold   is
      'When the stomach has become cold' (MD)

6.4   The accusative subject in Middle Dutch

Oblique subjects were not confined to bodies and body parts. Examples like the following were routine in the MD texts examined here:

(37) ***Dien doec***   *sal bernen sonder te bederven*
      the   cloth-DAT/ACC? shall burn   without to spoil
      'The cloth should burn without spoiling' (MD)

(38) *als **den pot**   beginnt te sieden*
      when the pot-DAT/ACC? begins   to boil
      'When the pot begins to boil' (MD)

Despite their pervasiveness, such examples have typically been dubbed 'scribal errors' and attributed to the instability of the grammar at this time – the transition from a system flush with inflections to one that was inflection-poor (see Burridge, 1996 for more examples and discussion of this feature). Yet, without exception all such examples involve clauses of low transitivity (for example, stative predicates, intransitives, reflexives and passives), where there is no argument filling the

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8.   The distinction had collapsed for the masculine but remained distinct for feminine and neuter nouns. However, at this time the traditional masculine/feminine/neuter gender distinction was also collapsing into a two-way system. Many nouns belonged to more than one gender, which meant that gender was not always a reliable guide here. In *denghenen die den hersen verwout* 'to-those who to-the brain is frenzied', for instance, *hersen* 'brain' (usually a feminine noun) receives a masculine/neuter ending.

agentive role. The appearance of the oblique is not random or in error, but is the direct consequence of the semantics of the matrix verb – as with the other experiencer-marked constructions, it highlights the non-active involvement of an entity.

7.   In sum

The abundance of dative participants in Old English and Middle Dutch medical texts is the fallout of a semantically expedient system, which at the time could encode fine-grained distinctions related to topicality, control and volition. This system gave rise to 'impersonal' expressions that sometimes showed person and number agreement on the verb (as in *me think*) or, as a more marked variant, showed no agreement and inflected for third person singular (as in *me thinks*, the classic impersonal construction). (Effectively, there was so much levelling of inflections going on in English and Dutch that this distinction was anyway not always apparent.) For those verbs whose meanings typically expressed non-volitional activities (like 'to be well/hungry/thirsty', etc.) and where entities were highly affected, the latter construction was preferred and its prominence made it possible to identify something that looked like a special class of impersonal verbs.

While it is often difficult to determine what is going on meaning-wise in these constructions, these magico-medical texts suggest that there are at least three things that motivate the appearance of a dative-marked person in construction types and the appearance generally of oblique subjects:

1.   The affectedness of an entity in an event (here the dative construction indicates that entities are more like recipients),
2.   the lack of control that an entity is perceived to have in an event (here the dative construction indicates that there is no obvious physical or material cause),
3.   the topic-worthiness of an entity (here the dative construction is more an expressive device).

All three factors interacted to bring about the appearance of dative arguments in these texts. In body part constructions, they determined the grammatical role of the person or body part experiencer; i.e. whether the patient was represented as a possessor in the genitive case or as a core argument in the nominative, accusative or dative case. It stands to reason that the special relationship that exists between body and person would make the dative construction a favoured one, particularly in medical texts where the plight of the person, literally as medical 'patient', was in focus. These various constructions are enacting prevailing medical thinking of

the time – a thinking that encompassed beliefs about the body that emphasized specifically its vulnerability to external forces.

8.   The decline of the dative-marked participant

> Man, in a word, has not always unconsciously taken for granted that he has a monopoly on consciousness. He felt that he shared mind – will, causation, consciousness and experience – with the rest of creation. He was not the only being capable of thinking, acting, and feeling. The world and other beings and intelligent forces outside of himself could act upon him just as well, and often to greater effect, as he could act upon them.   (Tripp, 1978, p. 1980)

Modern English no longer has morphological case for the nominal system and only vestiges remain for the pronominal system. As earlier described, the disappearance of experiential-coded grammar in English has been linked to this breakdown of its case system and the concomitant fixing of SVO word order. While I agree that linguistic factors such as case syncretism and word order changes have to be involved here, there has always been a problem with the chronology of this account – experiential constructions continued well into the 1500s, long after the case system had collapsed (in English the morphosyntactic changes were complete by the mid 1200s). Moreover, the distinction between nominative and oblique continued for pronouns and, since the dative experiencers were typically pronouns rather than full noun phrases, the attrition of the case system cannot fully account for the disappearance of non-nominative subjects. In fact, there is evidence that impersonal constructions were extended in Middle English, at least for certain verbs; to quote Allen (1995, p. 224): "dative Experiencers flourished during this period". It would seem then that at some stage English speakers simply ended up preferring constructions such as *I think* over those like *me thinks.* But why?

And what of those other modern Germanic languages that still possess the grammatical means for the expression of interested parties affected by events? Modern grammarians distinguish a number of different types of dative constructions in Modern German and to a lesser extent Modern Dutch, where the dative noun phrase is not a verbal complement but more as an adjunct, qualifying the clause as a whole. These are often called sentence (or personal) datives and include among others:

1.   the *dative of reference*, denoting the person to whom the statement holds true;
2.   the *dative of interest*, denoting persons who directly benefit or are somehow disadvantaged by the situation, sometimes termed the *dative of advantage/ disadvantage*;

3. the *ethic dative*, denoting persons who have an interest in the situation but whose involvement is more detached than in 1 and 2.

Despite the seeming abundance of sentence datives, the grammatical possibilities for introducing dative participants (not predicted by the sentence verb) have greatly diminished in these languages, and the range of structures allowing dative participants have well and truly shrunk (see the account in Lamiroy & Delbecque, 1998). As Donohue & Burridge (2007) conclude, the European predilection for dative subjects is alive – though clearly not well – in these modern languages. This cannot solely be attributed to the diminished case system (especially in the case of German where case is more or less intact).

Language change is never one-dimensional; typically it involves a number of different internal and external linguistic factors, as well as a range of cognitive, social, and interactional influences. There were undoubtedly additional extralinguistic forces working to bring about the gradual disappearance of dative experiencers. A significant factor must surely be the emergence of our modern secular sense of identity. Historian Roy Porter (2003), for example, traces the rise of the modern self-determining individual from the collective mind-set of medievalism, the breakthroughs of the Renaissance and Reformation to the "free-thinking atmosphere" of European Enlightenment; he also shows how innovations in medicine and techniques in dissection would have helped to dispel magical and folklorish beliefs about illness and to shape the modern view of our bodies and souls (see also Porter, 1997 for an account of these medical advances). The mental and cultural authority of the new autonomous individual was a world apart from the communal thought processes that were once so gripped by natural and supernatural outlooks – and, as described earlier, captured so expediently by the various dative constructions.[9]

A psychological account of this construction is by no means new.[10] Tripp (1978, p. 177) correlated the disappearance of impersonal constructions with what he dubs the rise of "the modern ego-centred personality."

> As the sole agent of history, the modern person has assigned all conscious action to the human subject and thus eliminated the participative basis for impersonal constructions, which require a sense of extra-human agency.

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9. Of course, it is precisely this shift in thinking that has relegated ethno-psychological accounts such as the present one to the lunatic fluff on the fringe of linguistics.

10. Even Jespersen (1927), in his account of impersonal verbs, suggested that it was a greater interest in human beings than in things that caused the person to be placed before the verb.

It stands to reason that human lives in medieval times were substantially different from those in modern times, and such a colossal transformation in the ways of thinking about the self is bound to have repercussions for linguistic structures – as LaPolla (this volume) argues, it is only logical there has to be a connection between all aspects of language and the culture and cognition of speakers. While break-throughs in science (say, in neural networking) and advances in experimental tools may one day shed light on the society, language and mind liaison, such claims are still difficult to test empirically. However, by drawing on established historical and sociological explorations of this transformation, I hope I have overcome the sort of arbitrariness that is a danger in such an account as I am offering here.[11]

Perhaps it is this budding self-awareness of the modern Western individual that has also contributed to some of the eccentric behaviour displayed by current-day expressions in English to do with ill-health and disease. Donohue & Burridge (2007) show that erratic morphosyntax manifests itself in odd collocations (*I've done my back in*), but can also involve idiosyncratic argument structures for certain verbs (*I've slipped a disc*, in which *slip* does not normally allow a postverbal bare NP). There is at least one verb, semantically intransitive but syntactically bivalent, with a pleonastic object (*He carked **it***). This behaviour is curious for an English verb: (notwithstanding peculiarities such as *leg it* and *hoof it*) most other examples of *it*-objects are at least possibly referential, and can be replaced with expanded NPs, unlike the *it* associated with *cark*. The lack of agentivity associated with the subjects of other transitive descriptions of affliction (*I've caught a cold* (**on purpose*)) is consonant with the atypical behaviour of these predicates, in which we repeatedly observe a syntactic pattern by which experiential events are coded more transitively than would be predicted from the argument structure alone. It is tempting to see these structures as more than random eccentricity in the language – is what we are seeing here the linguistic expression of the triumphant self-determining individual?

9. A final note on the expression of sickness and disease in Modern English

With the secure position afforded to us by twenty-first-century medicine, our fear of illness and disease is certainly less acute than in earlier times. Nonetheless disease is still something that afflicts us – we are patients and we exercise little

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11. See also Deutscher (2010) on the relationship between language and ways of knowing and perceiving.

control. For most of us ill health remains something of a mystery: there are symptoms and there are sick patients, but there is often nothing tangible in disease itself. It seems mostly to arrive out of the blue and just as mysteriously seems able transmit itself from person to person, affecting some while leaving others curiously untouched. This is particularly true in the case of stigmatizing illnesses, such as AIDS or cancer. Current social attitudes towards these and towards disorders included under the label mental illness still reflect the medieval equation of good with wellbeing and evil with disease.

As Porter's (1997) history of medicine shows, we have never before been so healthy, and yet ill-health continues to raise profound anxieties. English might have lost the grammatical means to express human experiencer subjects caught up in processes and states beyond their control; yet concepts of the body and its sickness continue to inspire some of our strongest linguistic taboos. References to illness and disease drip with euphemism – Allan & Burridge (2006, Chapter 9) describe the flourishing of figurative language and/or verbal play which English speakers rely on to censor the vocabulary of disease and death. The modern ego-centred self still has to confront the unnerving reality that, despite miracle cures and ageless bodies, it will not live forever.

10.   In conclusion

> Grammars code best what speakers do most.   (DuBois, 1985, p. 363)

Grammatical phenomena can come about because cultural and social factors will compel speakers to habitually include certain kinds of information in their conversations. Cultural preoccupations give rise to ways of thinking and ways of expression that, spurred on by the usual linguistic processes of change, can then end up embodied in the grammar; habitual conversational practices generate specialized constructions that then solidify into specific morphosyntactic constructions (see Goddard, 2002; LaPolla, 2003).

It would be remarkable indeed if Anabaptist symbols of subordination (epitomized in proverbial expressions such as it is more important 'to be honest than rich', 'to serve rather than be served', 'to yield to others rather than insist on one's own way' and so on) were *not* reflected in some way in the grammatical structuring of PG. A cautious turn of phrase involving future time such as *zehle* 'count' is made-to-measure and its routine use by PG speakers seals its fate as a future auxiliary. For a community of speakers uncomfortable with expressions of desire, *wotte* (the subjunctive of the modest wish) develops as a preferred construction to express yearnings – and thereby degrammaticalizes. And in a belief system that

subordinates self-will and self-love to the will of God, speakers favour the more tentative *fer* complementizer over the more confident *zu* construction.

The golden age of experiencer-coded constructions in the early history of Germanic exposes a humankind very much at the beck and call of natural and supernatural forces. But the notion of being non-volitionally or 'unself-controllably' involved in situations conflicts utterly with the modern secular sense of identity, which presupposes understanding and control (as epitomized in personal mantras such as 'doing your own thing', 'be true to yourself', 'your life is the fruit of your own doing', 'self help for positive life', 'believe in yourself', 'I will succeed' and so on) – the line is drawn between science and superstition and the calls of nature screened off with taboos and prohibitions.

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When culture grammaticalizes

The pronominal system of Onya Darat

Uri Tadmor

The Onya Darat language of Borneo has a large set of personal pronouns.
In addition to encoding the categories of person and number, these pronouns also
encode the generational affiliation of their referents. It is suggested that obligatory
expression of kinship in the pronoun system arose due to particular patterns of
marriage and emerged against the background of a traditional society where an
entire village shared one large house. This enabled all members of the community
to know each other intimately and to be aware of each other's generational
affiliation.

1. The Onya Darat language and its speakers[1]

The Onya Darat[2] are a Dayak[3] group living in the Ketapang regency of the
Indonesian province of Kalimantan Barat. Historically, members of the group were

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2. The group referred to here as *Onya Darat* has neither an autonym nor an exonym. Members of the group refer to themselves as *onya darat*, literally '(in)land people', to distinguish themselves from other groups such as the Malays and the Chinese. Although less than ideal, I use Onya Darat as a convenient name for the group and its language for lack of a better one.

3. *Dayak* is a cover term for members of the indigenous ethnic groups of Borneo. It specifically excludes the Malays.

hunter-gatherers who also engaged in limited swidden agriculture and animal hus-bandry. To supplement their income they also collected various forest products such as rattan and dammar resin and bartered them with Malay (and later Chinese) traders in exchange for goods such as salt, crockery, and woven cloth.

The Onya Darat language is the southernmost member of Land Dayak (also known as Bidayuhic), a group of languages spoken over a vast area in the interior of western Borneo. Land Dayak languages belong to the Austronesian family and are clearly part of the Western Malayo-Polynesian branch, but their exact posi-tion within this group is yet to be determined. It is one of the least-studied groups in the Austronesian language family, and the entire body of academic literature on it consists of a handful of articles and dictionaries and one descriptive book about the Bidayuh language (Rensch, Rensch, Noeb, & Ridu, 2012). The only academic publication thus far on Onya Darat is a short article on its orthography (Tadmor, 2009).

The main dialects of Onya Darat are Kualan, Samandang, Baram, and Simpang. This study focuses on the Kualan dialect, spoken in the small district town of Balaiberkuak and in some villages situated along the Kualan River. The Kualan dialect has more speakers than any other Onya Darat dialect. The total number of Onya Darat speakers is not known but is probably in the tens of thou-sands. Despite the recent disintegration of traditional social structures, the lan-guage is still used for daily communication by speakers of all ages. However, not all children are acquiring it as a first language. In particular, children growing up in Balaiberkuak often speak the local dialect of Malay or some variety of Indone-sian as their first language. This is especially the case among the rapidly increasing number of inter-ethnic families, even in rural areas. Due to this reason and to its relatively low status vis-à-vis Indonesian, the Onya Darat language is threatened, although not presently endangered.

2.   Encoding social information in pronouns: A Southeast Asian phenomenon[4]

In addition to their basic deictic and anaphoric functions, pronouns often encode additional information, for example about the referents' gender (as in *he*: *she*) and number (*I*: *we*). Pronouns can also be inflected for case, even in languages which do not express case overtly in other parts of the lexicon (as in *they*: *them*).

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4.   Henceforth, the term *pronouns* will be used as convenient shorthand for the more precise but longer expressions *personal pronouns* or *person markers*.

Sociolinguistic information may also be encoded in pronouns, although this is not common (beyond having a choice of two second-person pronouns based on politeness or formality, such as French *tu: vous*, German *Du: Sie*, and Russian *ty: vy*; for an early discussion see Brown & Gilman, 1960; for a more recent treatment, Helmbrecht, 2013).

In many languages of Southeast Asia expressions such as kinship terms, personal names, titles, demonstratives, and various combinations of these display syntactic distributional patterns similar to those of pronouns. For example, most speakers of Indonesian do not use pronouns to address their parents, preferring instead nouns meaning 'father' and 'mother' even in argument positions. Whereas an English speaker may tell his mother *I see you've had dinner already,* an Indonesian would typically say something like *Ibu sudah makan malam, ya?* (literally 'Mother has had dinner already, right?'). When speaking to a friend, a proper name may also be used: *Tuti sudah makan malam, ya?* ('Tuti has had dinner already, right?', where *Tuti* is the name of the addressee). English speakers also occasionally use kinship terms and personal names in place of pronouns, but this is limited to the speech of young children and is not acceptable in normal adult speech. In Indonesian and in various other languages of Southeast Asia such use is not only acceptable but indeed common in adult speech.

The availability of various non-pronominal expressions for personal reference in argument positions has led some linguists to conclude that in such languages there are no personal pronouns in the same sense as in languages such as English. Thus Cysouw (2003, p. 12) claims that in Thai 'real' person markers do not exist. Such statements, however, may be too extreme. Thai has several 'real' pronouns, including commonly-used 1SG and 2SG pronouns (*ku:* and *mɯŋ*) that meet all the requirements that Cysouw associates with person markers: they are shifters, they are specialized for that function (i.e. they have no other possible use), and they are used to refer to speech act participants (Cysouw, 2003, p. 5). Furthermore, there is no evidence that during their long history these two words have ever had any meanings other than 'I' and 'you'. Similar pronouns also exist in Burmese and in other languages which have been claimed to have no 'real' pronouns.

Nonetheless, it is certainly the case that in many Southeast Asian languages personal pronouns constitute a relatively open class, and that the distinction between pronouns and nouns is often less clear-cut than it is in many other languages. In these languages, pronouns may also encode different types of social and cultural information. Huffman (1970, p. 356) lists seven first-person pronouns and seven second-person pronouns that should be familiar to foreign students of Khmer. In a more exhaustive study, Cooke (1968, pp. 13–19) lists no fewer than 27 first-person pronouns and 30 second-person pronouns in Thai. An

example for a Thai pronoun that encodes much social and cultural information is *jo:m*, a second-person pronoun used exclusively by monks to address laymen, which can be seen in Example (1) below (taken from Jayasaro & Issara, 2009, p. 24).[5]

(1) a. *ma: pàtìbàttham thî: bâ:n   bun   thi:raj   thammaj fŏn*
         come meditate   at   house merit whenever why   rain

         thŭŋ   tòk   thúk thi: khráp
         arrive fall each time   FIN

         'Why does it rain every time I come to meditate here?'

    b. *â:w   kɔ̂:   phrɔ́ʔ   jo:m ma: phiang pi: lá   khráng*
        EXCL   indeed because 2   come only   year per   time

        lɛ́   nî: kɔ̂:   pen ruudu: fŏn   sá   dûaj
        and   here indeed be   season rain PART also

        'Oh, it's because you come only once a year, and always in the rainy season!'

Many Austronesian languages also encode sociolinguistic information in their pronoun systems. Javanese has a rigid distinction between different sets of words, including pronouns, the choice of which depends on the relative social status of the referents (Errington, 1988; Myhill, 1994; Wolff & Poedjosoedarmo, 1982). The use of these different vocabulary sets results in the so-called 'speech levels' of Javanese. Very roughly, for first-person reference Javanese uses *aku* when the interlocutor is a close intimate of the speaker or is of obviously lower social status; *kula* is used when talking to equals with whom one is not on intimate terms, as well as to social superiors; and *dalem* is used when addressing royalty. The equivalent second-person pronouns used in similar situations are *kowé*, *sampéyan*, and *panjenengan*.

   In traditional Toba Batak pronoun choice depended on clan membership (called *marga*). According to van der Tuuk (1971, pp. 218–219), who described Toba Batak as it was spoken in the mid-19th century, the second-person pro-

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5. Abbreviations used in the examples: > older generation; ≤ same or younger generation; = same generation; ≠ different generation; 1, first person; 2, second person; 3, third person; 12, combined first and second person; ACT, active; ADV, adverbial; APPL, applicative; CAUS, causative; CIRC, second element of a circumfix; CONC, concessive; DEM, demonstrative; DU, dual; EMPH, emphatic; EPIT, epithet; EXCL, exclamation; EXPR, expressive; FIN, clause-final particle; FUT, future; INTR, intransitive; INVOL, involitive; NEG, negative; PASS, passive; NOMZ, nominalizer; PF, perfective; PL, plural; PROG, progressive; PROX, proximal; RED, reduplication; REG, regal; REL, relative; ROY, royal; SG, singular; TOP, topic; VOC, vocative.

noun *hamú* (*hamuna*) was "used instead of *ho* as a singular pronoun to persons who, in relation to the speaker, belong to a different *marga* or must be regarded as so belonging", while *ho* was "used to persons to whom it is not necessary to use *hamú*." Similarly, for third-person reference the pronoun *ibana* was "used of persons [...] of whom it is not necessary to use *hamú*" (van der Tuuk, 1971, p. 217), while *nasida* was used "instead of *ibana* in those cases where *hamú* is used instead of *ho*" (van der Tuuk, 1971, p. 219). Since *hamú* and *nasida* were historically plural pronouns, an asymmetrical situation existed whereby only referents who were members of one's own clan could be distinguished for number. Moreover, married women were considered as belonging to their husband's clan (van der Tuuk, 1971, p. 219). Because Toba Bataks were strictly exogamous and did not intermarry with members of their own clan (Sinaga, 2006, p. 227), married sisters were considered to be members of different clans than their brothers and were addressed by them using the pronoun *hamú*, unlike unmarried sisters who were addressed by *ho*. We thus see that the incorporation into the pronoun system of a seemingly straightforward social category such as clan membership can lead to considerable complexity. The situation in Toba Batak is summarized in Table 1.

Table 1. Second and third person pronouns in Toba Batak

	Members of the same clan (i.a. parents, unmarried sisters, father's brothers)		Members of a different clan (i.a. parents-in-law, married sisters, mother's brothers)
	Singular	Plural	(No number distinction)
Second person	*ho*	*hamú*	*hamú*
Third person	*ibana*	*nasida*	*nasida*

Like Khmer and Thai, Malay also has a large set of pronouns. Several are used only by, towards, or in reference to monarchs. Malay monarchs refer to themselves as *béta*; when speaking to a monarch, one refers to oneself as *patik* and to the monarch as *Tuanku*;[6] and the pronoun used to refer to a monarch in the third person is *baginda* (for a full description see Asmah, 2004). Examples (2) and (3) are taken from contemporary newspaper articles.

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6. Historically *tuanku* meant 'my lord' (*tuan* 'lord', *-ku* '1SG'), but the form has lexicalized to mean 'you'. The lexicalization is clear from the fact that using *aku* (and its suffixal form *-ku*) is very inappropriate when addressing a monarch, when the proper 1SG pronoun is *patik*.

(2)   **"Beta**   ber-harap   kita semua akan dapat men-[t]unai-kan
      1SG.REG   INTR-hope   12[7] all   FUT get   ACT-carry.out-APPL

      amanah yang di-per-tanggung-jawab-kan   ini
      mandate REL   PASS-CAUS-bear-answer-APPL DEM.PROX

      *dengan se-baik   mungkin," titah   **baginda**.*
      with   as-good   possible   say.ROY 3SG.ROY

      '"I hope that we will all be able to carry out the mandate entrusted to us as
      well as possible," he said.' (Utusan Online, 2012)

(3)   *Apa   per-[r]asa-an   **Tuanku** men-jadi   se-orang   raja?*
      what NOMZ.feel.CIRC   2.ROY   ACT-become one-people king

      Patik   *ini*   *tidak pernah*   *men-jadi   raja,*
      1SG.ROY DEM.PROX NEG   have.occasion ACT-become king

      *jadi **patik**   tidak tahu apa per-[r]asa-an   **Tuanku**.*
      SO   1SG.ROY NEG   know what NOMZ.feel.CIRC   2.ROY

      'How do you feel being king? I've never been king, so I don't know how you
      feel.' (Utusan Online, 2002)

Two other sociolinguistic variables, ethnicity and formality, are nicely demon-
strated by Examples (4)–(7), taken from the novel *Bila Lampu Padam* [*When the
Lights Are Out*] by Zaifuzaman Ahmad (2008). In the book Ahmad, an ethnic
Malay, pays a visit to wholesale clothing trader Chong Meng, an ethnic Chinese.
Chong Meng refers to himself by the 1SG pronoun *wa* which normally designates
the speaker as an ethnic Chinese, and addresses Ismail by the 2SG pronoun *lu*, used
in Peninsular Malay by ethnic Chinese (of either gender) and also by members of
other ethnic groups to address members of the Chinese minority (Zaifuzaman,
2008, pp. 143–144):

(4)   *Kalu lu   tak   mahu, wa ada baju dan seluar   dari Jepun.*
      if   2SG NEG want   1SG exist shirt and trouser from Japan
      'If you don't want those, I also have shirts and trousers from Japan.'

On the other hand, Ismail uses the formal pronouns *saya* (1SG) and *awak* (2SG)
(Zaifuzaman, 2008, p. 143):

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7.   The terms *inclusive* and *exclusive* are avoided because from the speakers' point of view
so-called *first person plural inclusive* pronouns are no more first-person pronouns than they
are second-person; they simultaneously refer to the speaker(s) and to the addressee(s). Simi-
larly, as far as the speakers are concerned, so-called *exclusive* 1st person dual/plural pronouns
are simply first-person pronouns which, unlike first-person pronouns in European languages,
can only refer to the speakers and not to the addressee(s).

(5) *Awak   tauke   besar.   Tak   ter-jejas.   Tapi   saya   ni*
     2SG   boss   big   NEG   INVOL-hurt   but   1SG   this

     ber-niaga   kecil.kecil.an.
     INTR-trade   small.RED.ADV

     'You're a big trader, you aren't hurt (by the economic situation).
     But I'm a small-time trader.'

However, as the negotiations progress Ismail switches from the formal and ethnically neutral 1SG *saya* and 2SG *awak* to the typically Chinese 1SG *wa* and 2SG *lu*, as a sign of intimacy (and implicitly in the hope of thereby obtaining a discount; Zaifuzaman, 2008, p. 144):

(6) *Lu   tak   jual   timbang   ke   ni   seluar?*
     2SG   NEG   sell   weigh   Q   DEM.PROX   trousers
     'Don't you sell these trousers by weight?'

(7) *Okey-lah   tauke   kalau   itu   macam.   Kasi   wa   satu   bundle.*
     Okay-CONC   boss   if   that   sort   give   1SG   one   bundle.
     'OK then, in that case just give me one bundle.'

The 'ethnic Chinese' pronouns *wa* and *lu* used in the examples above are loanwords from Hokkien; the formal 1SG pronoun *saya* is a Sanskrit loanword (Tadmor, 2007, p. 316). Indeed, borrowing into pronoun systems, which constitute closed sets in European languages, is quite common in languages of Southeast Asia. The motivation for borrowing is often to make possible sociolinguistic distinctions based on variables such as ethnicity, formality, and social distance. In the example below (from Najwa, 2009) another pair of borrowed pronouns are used by the writer, this time 1SG *I* and 2SG *you* (from English). These two pronouns are entrenched in urban peninsular Malay and used mostly by educated members of the middle and upper classes.

(8) *Sayang, I   cinta   you   sangat!   Terima   kasih   sebab   cinta-kan   I*
     love   1SG   love   2SG   very   receive love   cause   love-APPL   1SG

     dan   beri-kan   I   peluang   untuk   mem-besar   dengan   you
     and   give-APPL   1SG   opportunity   for   ACT-big   with   2SG

     dan   buat   semua   bende   dengan   you.
     and   do   all   thing   with   2SG

     'Darling, I love you very much! Thank you for loving me and for giving me the opportunity to grow with you and to do everything with you.'

Many languages of Southeast Asia, then, encode in their pronominal systems various sociolinguistic categories that are seldom expressed in the pronominal systems of languages from other parts of the world. The remainder of this chapter will

be devoted to showing how one such category, generational affiliation, is encoded in the pronouns of Onya Darat, and to describing the social and cultural context against which this grammatical category arose.

3.   The pronominal system of Onya Darat

Onya Darat pronouns distinguish between first, second, and third persons, in addition to combined first-and-second person pronouns.[8] These are further divided into singular, dual, and plural pronouns. In addition, almost every person-number combination has two distinct pronominal forms whose choice depends on the generational affiliation of the referents. A summary of Onya Darat personal pronouns is provided in Table 4 at the end of this section.

The key to understanding the unusual grammatical category of generational affiliation and how it is used lies in a quasi-classificatory kinship system in which the crucial conditioning factor is generational affiliation. In classificatory kinship systems, first described by Morgan (1868), all members of a speech community are classified as having a specific kin relationship with each other. This relationship can – but need not – be an actual genealogical relationship. Each speaker of Onya Darat classifies all other members of the community into generations, and pronoun choice depends on the generational affiliation of the referents.[9] For example, a member of an older generation than that of the addressee refers to himself as *maaq*, but a member of the same generation or a younger generation refers to himself as *oko*. Thus the correct self-reference when talking to one's child is *maaq*, while when talking to a sibling or to a parent it is *oko*. Similarly, one's child or sibling is addressed as *omo* while one's parent is addressed as *okam*. Since pronouns are used in communication among all members of the community, not just with one's immediate relatives, each member of the community must be designated by the speaker as belonging to a particular classificatory generation vis-à-vis himself.

Since pronoun choice is determined by generational affiliation and not by age, different pronouns may be used by adults when communicating with children who are not their own depending on whether the relevant child is a member of the

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8.   See Footnote 7.

9.   In a fully classificatory system each speaker calls each other member of the community with a particular kinship term, whether the relationship is real or abstract. This is not the case in Onya Darat; however, each speaker must be aware of his or her generational affiliation vis-à-vis every other member of the community in order to use pronouns correctly.

Table 2. Usage patterns of 1SG and 2SG pronouns in Onya Darat

First person	Second person	Typical situation
maaq	*omo*	Parent talking to his/her child
maaq	*okam*	(*Does not occur*)
oko	*omo*	Person talking to his/her sibling
oko	*okam*	Child talking to his/her parent

same, younger, or older generation. (The latter case is not unusual in a traditional society where a couple may have a large number of children born over a period of decades.) Table 2 provides an overview of all possible combinations of first- and second-person singular pronouns with examples of prototypical situations in which they are used. The only combination that does not occur is *maaq + okam*, because it is impossible for two interlocutors simultaneously to belong to an older generation than each other.

In Example (9),[10] a folk tale character is talking to his mother, and therefore refers to himself as *oko*, the 1SG pronoun used when the speaker is a member of the same or younger generation than the addressee:

(9)　"A,　*tonday* [*in-*]*ndoq*,　**oko** *geq*　*n-*[*t*]*obang-neh*," *jay-neh*.
　　EXCL wait　　VOC-mother[11] 1SG≤　PROG ACT-fell-3SG≤　　say-3SG≤
　　'"Hey, wait Mom, I'm chopping it down," he said.'

In Example (10), an elderly woman is talking to a young man. She is affiliated with the generation of the man's grandparents. Because the speaker is a member of an older generation than that of the addressee, she uses the 1SG> pronoun *maaq*:

(10)　*Onaq* **maaq** *mpat, dari baang.*
　　　child 1SG> four　male all
　　　'I have four children, all boys.'

In Example (11), a legend character is talking to her child as he is getting born (already an adult, as it were). These are the same characters that appear in

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11.　As in many Western Austronesian languages, vocatives are formed by clipping the full forms of nominals used in argument positions. Usually the full form is reduced to its final syllable, as in this case.

Example (9) above. The mother uses the 2sg≤ pronoun *omo*, reserved for addressing members of the same or younger generations:

(11)   *"Eh,"   jay indoq-neh,   "mbay-am, **omo** pun geq   kaluar."*
        EXCL say mother-3SG≤   NEG-PF   2SG≤ TOP PROG go.out
        ' "Hey", said his mother, "don't, you're just coming out now"'.

In Example (12) the same persons as in Example (10) above are talking. The young man is now addressing the elderly woman affiliated with his grandparents' generation. Therefore he must employ the 2sg> pronoun *okam*, used when the addressee is a member of an older classificatory generation:

(12)   *Dah   ba-icet   gon   **okam?***
        already INTR-great.grandchild not.yet 2SG>
        'Do you have any great-grandchildren?'

3sg pronouns behave somewhat differently from 1sg and 2sg pronouns. There are two distinct 3sg forms: *idoh* (clitic form *-doh*) refers to a member of an older generation, while *iyo* (clitic form *-neh*) refers to a member of the same or younger generation. Confusingly, however, the same speaker can refer to the same third person sometimes as *idoh* and other times as *iyo*. This is because unlike 1sg and 2sg pronouns, which express the generational affiliation of referents vis-à-vis each other, 3sg pronouns expresses the generational affiliation of the third person referent vis-à-vis any other person (or persons). This other person can be the speaker, the addressee, or another third person. Thus speakers normally refer to their own mother as *idoh*, a pronoun which expresses her older generational affiliation vis-à-vis themselves. But when talking to children about their (the children's) mother, speakers refer to her as *idoh* regardless of their own generational relationship with her in order to express the generational difference between the mother and her children (in this case the addressees). When talking about a mother and her child, one refers to the mother as *idoh* and to the child as *iyo*, to express the generational relationship between the two (third persons).

    In Example (13) a woman is talking about her granddaughter. The 3sg≤ pronoun *iyo* indicates the generational relation between the referent and the speaker:

(13)   *Jong **iyo** geq   ocek   haeq-eh.*
        time 3SG≤ PROG small before-FIN
        'At that time she was still young.'

In Example (14) a woman is talking about her niece. She might be expected to use the pronoun *iyo*, because the niece is clearly a member of a younger generation than her own. However, the niece happens to be the addressee's mother, so the speaker selects the 3sg> pronoun *idoh*, indicating the generational relation between the referent and the addressee:

(14)   *oy,*   *mangkaq* **idoh** *pecen*   *ka* **maaq,**
       EXCL that's.why 3SG> like.that to 1SG>

       seli   *likat* *ka* **maaq** *deh.*
       truly sticky to 1SG> EMPH

       'Oh, that's why she was like that with me, she really clung to me.'

Example (15) contains both 3SG pronouns expressing the generational relations between two third-person referents. It is taken from a story about Pak Aluy, a well-known folk tale character in western Borneo, and his son Aluy. The 3SG≤ pronoun *iyo* refers to Aluy and the 3SG> pronoun *idoh* refers to his father Pak Aluy. This indicates the generational relation between the two.[12]

(15)   *an, dah*   *ng-[k]oping* **iyo**   *ng-[k]osu kuyuq nayuk-neh-eh*
       so   already ACT-ear   3SG≤ ACT-call dog   puppy-3SG≤-FIN

       baroq   *idoh* *tamaq.*
       only.then 3SG> enter

       'So, after having heard his son call his little dog, only then did he go inside again.'

Non-humans are normally referred to by 3SG≤ *iyo*. Example (16) is from a conversation with a woman suffering from severe itching which she attributes to worms crawling under her skin.

(16)   *nto*   *roneq-em, arong nto*   *kerap-kerup* **iyo**   *rararap.*
       DEM.PROX tiny-PF   place DEM.PROX EXPR   3SG≤ EXPR
       'This one is just tiny, but the one here keeps creeping and crawling.'

Non-singular pronouns behave differently from singular pronouns. Compare, for example, some uses of the 2DU pronouns *kanduh* and *kamaaq* in Table 3.

Table 3. Some use patterns of the 2DU pronouns *kanduh* and *kamaaq*

Interlocutors addressed as	Typical situations
kanduh	Person talking to his/her (two) children
	Person talking to his/her parents
	Person talking to his/her (two) siblings
kamaaq	Person talking to his/her spouse and child
	Person talking to his/her father and sister
	Person talking to his/her aunt and cousin

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12.   It should be noted that in most tales (including this one) Pak Aluy behaves exceedingly stupidly and is therefore the object of derision. The fact that *idoh* is nevertheless used for referring to him demonstrates that pronoun choice in Onya Darat is not based on politeness but purely on generational affiliation.

A speaker thus uses the same pronoun, *kanduh*, whether addressing interlocutors who are members of younger, older, or the same classificatory generation.[13] However, a different pronoun, *kamaaq*, is used when there is a difference in the generational affiliation of the two addressees. As the examples below demonstrate, all non-singular pronouns behave similarly in that they convey the generational relations between the multiple referents expressed by the pronoun rather than between the referents and some other speech act participants. In other words, non-singular pronouns distinguish between multiple referents who all have the same generational affiliation on the one hand, and multiple referents who are members of different generations on the other hand.

In Example (17) a woman is talking about her granddaughter and great-granddaughter. Since the referents of the pronoun are members of different generations, she uses the 3DU≠ pronoun *damaaq* rather than the 3DU= pronoun *doduh*.

(17)   *nto*   *nongah-neh*   *mori*   *koih*   ***damaaq***.
       DEM.PROX   while-ADV   go.home   there   3DU≠
       'Right now they are both back home.'

In Example (18) a woman is recalling an incident when her brother got sick and her father went to fetch a shaman called Keq Reken. She refers to herself and her siblings with the 1PL= pronoun *ome*, because all are members of the same generation.

(18)   *opaq*   *ome*   *haeq-eh,*   *ka Balonse*   *m-[t]iyaq Keq   Reken*.
       father   1PL=   before-FIN   to Belonsai   ACT-take   EPIT   Reken
       'Our father then went to Belonsai to fetch Keq Reken.'

When the same woman later talks about her nuclear family, she uses the pronoun *manaq*, because now the referents are members of different generations (parents and children):

(19)   *Nyanyanyap*   *mis-eh,*   *manoq*   ***manaq***   *limaq.puloh,*
       EXPR   recent-FIN   chicken   1PL≠   fifty

       mondiq-im   *samparan-eh.*
       come-PF   k.o. disease-FIN

       'Eventually, we had fifty chickens, but then came the chicken epidemic.'

Example (20) is from a folk tale. One of the characters suggests that another character called *Untuy* together with his brothers should jointly marry a celestial bride. Since Untuy and his brothers are all members of the same generation, the 2PL= pronoun *kadiyen* is used, rather than the 2PL≠ pronoun *kenaq*.

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13.   This is further evidence that pronoun choice is not based on politeness and is thus unrelated to honorifics.

(20) ***Kadiyen*** *paji   tian sabat,* **oko** *nto   mbay mudah.*
2PL=   tomorrow first marry, 1SG≤ DEM.PROX NEG   easy
'Why don't you guys get married first, for me it's not that easy.'

In contrast, when a man is talking about his cousin and his family (including the cousin's parents, who are the speaker's aunt and uncle) in Example (21), he uses *kenaq*, because the referents are members of different generations:

(21) *Kola bah   diam di rumah kenaq lap-neh.*
ever EMPH stay at house 2PL≠ maybe-ADV
'I did stay at your (family's) house, I think.'

Example (22) is from the same story as (20). Untuy and his brothers are now marrying the celestial bride offered to them. The 3PL= pronoun *diyen* is used to refer to the three of them, as they are members of the same generation:

(22) *Dah cader   baroq   **diyen** sabat.*
PF   prepare.wedding only.then 3PL=   marry
'After having prepared the wedding, they got married.'

In Example (23), a woman is talking about her cousin's family, consisting of the cousin, her husband, and their children. She uses the pronoun *denaq*, because all are not members of the same generation:

(23) ***Denaq*** *diam di Langkar haeq-eh,*
3PL≠   stay at Langkar before-FIN

ng-[k]orek gotah   Keq Limbong.
ACT -tap   rubber EPIT Limbong

'They stayed in Langkar at that time, tapping rubber for Keq Limbong.'

In sum, personal pronouns in Onya Darat encode three categories:

– *Person:* First, second, third, and combined first+second[14]
– *Number:* Singular, dual, and plural[15]
– *Generational affiliation:*
  – for singular pronouns: same or younger generational affiliation (≤), older generational affiliation (>)
  – for non-singular pronouns: same generational affiliation (=), different generational affiliation (≠)

14. See Footnote 7.

15. Dual pronouns are used when there are exactly two referents, while plural pronouns are used when there are two or more referents. The use of dual pronouns is therefore optional, which explains their relative rarity in the corpus.

The pronouns of Onya Darat can now be summarized in Table 4. They bear out Aikhenvald & Dixon's observation that the world's most complex pronominal systems "tend to be found in small-scale language communities with a classificatory kinship system" (Aikhenvald & Dixon, 1998, p. 254).

Table 4. The personal pronouns of Onya Darat

Person	Number	Generational affiliation of referent(s)	Independent form	Clitic form
1	singular	≤	*oko*	*-ko*
1	singular	>	*maaq*	–
2	singular	≤	*omo*	*-mo*
2	singular	>	*okam*	*-kam*
3	singular	≤	*iyo*	*-neh*
3	singular	>	*idoh*	*-doh*
1	dual	=	*aduh ~ oduh*	–
1	dual	≠	*maq dukah ~ maaq badukah, manaq badukah*	–
12	dual	unmarked	*odup dukah ~ odup badukah*	–
2	dual	=	*kanduh*	–
2	dual	≠	*kamaaq ~ kamaq*	–
3	dual	=	*doduh*	–
3	dual	≠	*damaaq ~ damaq*	–
1	plural	=	*ome*	–
1	plural	≠	*manaq*	–
12	plural	unmarked	*odup*	*-dup*
2	plural	=	*kadiyen*	–
2	plural	≠	*kenaq*	–
3	plural	=	*diyen, side*	–
3	plural	≠	*denaq*	–

(Symbols: 1 'first person', 2 'second person', 12 'combined first+second person', 3 'third person', > 'older generation', ≤ 'same or younger generation', = 'same generation', ≠ 'different generation')

4.   The origins of generational affiliation marking

This section will examine the physical and social environment as well as the cultural preoccupations that gave rise to the encoding of generational affiliation in Onya Darat pronouns. As Lupyan & Dale (this volume) note, "just as looking to

the physical environment is necessary to explain differences in cultural practices such as clothing styles and building techniques – looking to the social and physical environment is necessary for understanding at least some reasons why languages vary in the way they do." Burridge (this volume) similarly notes that

> [g]rammatical phenomena can come about because cultural and social factors will compel speakers to habitually include certain kinds of information in their conversations. Cultural preoccupations give rise to ways of thinking and ways of expression that, spurred on by the usual linguistics processes of change, can then end up embodied in the grammar; habitual conversational practices generate specialised constructions that then solidify into specific morphosyntactic constructions (see Goddard, 2002; LaPolla, 2003).

What follows is an examination of the external (non-linguistic) context that gave rise to this grammatical subsystem as well as an examination of the internal (linguistic) origin of the specific pronominal forms. The latter is particularly interesting because there is no evidence that Proto-Land Dayak encoded generational affiliation in its pronominal system (Rensch et al., 2012), nor did the earlier ancestors Proto-Malayo-Polynesian and Proto-Austronesian (Ross, 2006). The innovation seems to be relatively recent and limited to Onya Darat and perhaps a few other languages of central western Borneo.

As mentioned before, in order to use Onya Darat personal pronouns correctly all members of the community must know each other intimately. Otherwise it is unlikely that a speaker would know, for instance, that X, who is younger than Y, is in fact the cousin of Y's mother, and is therefore a member of an older generation. Only people who associate with each other closely on a regular basis would come to learn and remember this type of information.

Like other Dayak groups, the Onya Darat traditionally lived in large communal dwellings that consisted of individual apartments arranged in a long row and which were therefore called 'longhouses' by the British when they first encountered them in northern Borneo.[16] Onya Darat longhouses were built on stilts high above the ground to protect them against possible attacks. An enclosed veranda running the length of the longhouse was used for socialization and communal activities. A typical Onya Darat village consisted of a single longhouse comprising between six and sixty apartments, each housing a nuclear family.[17] By their

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16. Longhouses are called *botang* in Onya Darat; the term for single-family dwellings is *rumah*, a word borrowed along with the concept it denotes from the Malays.

17. By the time I started my fieldwork with the Onya Darat in 2001 the last of the longhouses had already been dismantled. I was, however, able to visit a few longhouses belonging to members of other ethnolinguistic groups in western Borneo.

nature, such communities were small and close-knit. It was this extra-linguistic environment that facilitated the encoding of generational relations in the Onya Darat pronominal system.

Generational relations are crucial to the regulation of various social interactions in Onya Darat society. Traditional Onya Darat law has a taboo against marrying consanguines (persons of the same bloodline). This taboo is absolute between a person and his/her progenitors and descendants as well as among siblings. Other consanguines are divided into two classes. The relationship between consanguines who are not progenitors or descendants of each other and are members of different classificatory generations is called *domar*. The relationship between consanguines who are not siblings but are members of the same classificatory generation is called *moduh*. Two persons who are in a *domar* or *moduh* relationship with each other are prohibited from marrying, but this prohibition is not absolute. It can be absolved by performing a cleansing ritual or by paying a fine collected by the *tamanggong* (ceremonial chief) on behalf of the community. The lesser the degree of consanguinity, the weaker the prohibition and the smaller the fine. The influence of generational relations on social interaction extends well beyond marriage prohibitions. For example, members of a younger classificatory generation are prohibited from giving orders to a member of an older classificatory generation in a *domar* relationship even if the latter is much younger than the former. It is reasonable to assume that the important distinction between *domar* and *moduh* relations contributed to the development of generational affiliation marking in personal pronouns. Indeed, as will be shown below, there are etymological connections between the words *domar* and *moduh* and a number of pronouns.

Supporting evidence for the importance of generational affiliation in Onya Darat society comes from the practice of teknonymy (renaming parents after their children). Upon birth, Onya Darat children are given a unique name that – to the best of their parents' knowledge – has never been used as a personal name before. Upon the birth of one's first child, the birth name of the child's parents is replaced by a teknonym consisting of the child's name preceded by *Maq* for women and *Paq* for men. (These epithets are truncated forms of *umaq* 'mother' and *opaq* 'father'). When one's first grandchild is born, one's name changes once more to the grandchild's name preceded by *Neq* for women (from *ineq* 'grandmother') and *Keq* for men (from *akeq* 'grandfather'). As will be shown below, some Onya Darat pronouns are derived from expressions meaning 'X and his/her/their child(ren)'. Apparently they were originally used to refer to actual parents and children before being generalized for classificatory intergenerational relations. Subsequently these expressions underwent grammaticalization and were phonologically reduced to such an extent that they are

no longer analysable to modern speakers. Encoding parent-child relations in the pronominal system is directly related to encoding parent-child relations in the naming system.

Dixon (2010, p. 7) notes that "the most complex grammatical systems […] are typically found in languages spoken by small tribal groups." The observation that small traditional societies tend to have more deictic (including pronominal) complexity is attributed by Trudgill (this volume) to the work of Paul Kay and Revere Perkins in the 1970s. Trudgill further notes (p. 140) that "[s]ome languages have highly elaborated pronominal systems whose elaboration is not motivated by the presence of a social hierarchy or politeness factors that have led to the pronominal complexity that we find, for instance, in Korean and Thai." He also points out (p. 136) that "languages and dialects spoken in small, low-contact, isolated communities with tightly-knit social networks and large amounts of communally shared information are becoming less and less common."

We now turn to the etymology of Onya Darat pronouns, which sheds light on the circumstances of the development of generational affiliation marking. Several forms are derived directly from Proto-Austronesian (PAn). All three singular pronouns with '≤' referents derive from PAn clitic pronouns: 1SG≤ *oko* < 1SG PAn *-ku*, 2SG≤ *omo* < 2PL PAn *-mu*, and 3SGg≤ *iyo* < 3SG PAn *-ya*[18] (reconstructions are from Ross, 2006, p. 532; the initial vowel in all three forms is prothetic).[19] In a similar fashion, the 1PL= pronoun *ome* is derived from PMP *-mi* with a prothetic *o-*. The 3SG> pronoun *idoh* is a reflex of the Proto-Malayo-Polynesian (PMP) 3PL pronoun *(s-)ida*.[20] The use of an originally plural pronoun to refer to singular as well as plural members of older generations is reminiscent of (though different from) the universal tendency of plural pronouns to develop honorific meanings. The semantic relationship between plurality and honorificity is well documented in many languages around the world (Brown & Gilman, 1960), including Austronesian languages (Blust, 1977).

1SG> *maaq* is probably a phonologically reduced form of *domar* 'the relationship between members of different classificatory generations who are not

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18.   The change *a* > *o* in *iyo* is irregular and may have been due to analogy to the final *-o* of *oko* and *omo*.

19.   Another example for *o*-prothesis in Onya Darat is the word *onya* 'people' (as in Onya Darat); the basic form is *nya*, a word of Mon-Khmer origin – but that is a topic for a separate article.

20.   Again with unexpected /o/ instead of /a/ in the second syllable due to analogy to other pronouns.

progenitors or descendants of each other.'[21] The 2sG> pronoun *okam* is ultimately derived from PAn **kamu* '2PL', although the loss of the final -*u* is unexplained.[22] It should be noted that in Banjar, the most important lingua franca of southern Borneo, the second-person pronoun is *ikam* (the *i-* is probably of prothetic origin, like the *o-* of Onya Darat *okam*), so the form may have been borrowed.

Onya Darat dual pronouns include six synchronically monomorphemic forms (*aduh ~ oduh* '1DU=', *kanduh* '2DU=', *kamaaq~kamaq* '2DU≠', *doduh* '3DU=', *damaaq* '3DU≠') and two transparently phrasal/compound forms (*maaq badukah ~ maq dukah* '1DU≠', *odup badukah ~ odup dukah* '12DU'). The '=' dual pronouns (*aduh ~ oduh* '1DU=', *kanduh* '2DU=', *doduh* '3DU=') all end with the morph -*duh*, most probably derived from *moduh* 'the relationship between members of the same classificatory generation who are not siblings'[23] and appear to have originated from phrases containing a pronoun followed by the verb *bamoduh* 'to be in a *moduh* relationship'. The dual '≠' pronouns *kamaaq~kamaq* '2DU≠' and *damaaq* '3DU≠' contain the morph *maq ~ maaq*, derived from *domar*, as discussed above.

Like dual pronouns, plural pronouns are innovative, with the exception of *ome* '1PL=' discussed above. The plural '=' pronouns *kadiyen* '2PL=' and *diyen* '3PL=' end with the distal element -*en* (cf. *nyen* 'that', *koen* 'thither', *dicen* 'hither', *paden* 'like that'). Dual and plural second-person pronouns all have an initial *k-*, derived from phrasal expressions in which the first element was a reflex of PAn **kamu* '2PL': *kanduh* '2DU=', *kamaaq* '2DU≠', *kadiyen* '2PL=', *kenaq* '2PL≠'. Dual and plural third person pronouns all begin with *d-*, probably ultimately derived from **(s)-ida* '3PL': *doduh* '3DU=', *demaaq* '3DU≠', *diyen* '3PL=', *denaq* '3PL≠'.

All pronouns in the plural ≠ set end with -*naq*, clearly derived from *onaq* 'child': *manaq* '1PL≠', *kenaq* '2PL≠', *denaq* '3PL≠'. They probably originated from phrases meaning 'X and (your/his/her/their) child(ren)'. Finally, the alternative 3PL= pronoun *side* does not fit into the patterns described above and is in all probability a loanword from the local Malay dialect, where the 3PL pronoun is *sidə*. The form only occurs in the Kualan dialect, spoken in and around the district town of

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21.   When Onya Darat content words undergo grammaticalization the initial syllable may delete; monosyllabic function words can in turn be re-expanded to the canonical disyllabic shape by doubling the nucleus vowel. Final glottalization is also sometimes part of the grammaticalization process; for example *kayoq* 'classifier for long hard objects' is derived from *kayu* 'tree, stick' and *baroq* 'just' is derived from *baru* 'new'. Thus the derivation would be *domar > *mar > maq ~ maaq*.

22.   There are no other recorded cases of final vowel deletion in the history of Onya Darat.

23.   The word *moduh* is a cognate of Malay *madu* 'co-wife', in turn related to *adu* 'compete' (as fellow wives compete for their husband's affection). The phonetic similarity of -*duh* to *dukah* 'two' is probably coincidental.

Balaiberkuak, where speakers of Onya Darat are in closest contact with speakers of Malay. In fact, Malay *sidə* is etymologically related to the directly inherited pronoun *idoh* '3sG>' (both are reflexes of PAn **(s)ida* '3pl').

A final note: It was only after the author had completed his analysis of Onya Darat pronouns that he became aware that encoding kin relations in the pronominal system is not unique to central western Borneo and has been recorded in some languages of Australia. According to Evans (2003, p. 24), "[m]ore than 20 Australian languages, in a number of distinct regions, have kinship-sensitive constructions of some sort." The first to describe the phenomenon, according to Evans, was Hale (1966, pp. 219–220). McKnight (1999) reports that the Australian language Lardil has "an elaborate pronominal system consisting of 19 pronouns […] This system is tied to the kinship and marriage system. One cannot use the pronominal system correctly without a knowledge of the kinship and marriage system." Although the details are different, this description would also fit Onya Darat.

5.   Conclusion

In addition to the categories of person and number, the personal pronouns of Onya Darat also encode information about the generational affiliation of their referents. 1sG and 2sG pronouns encode generational relations between the interlocutors. 3sG pronouns encode generational relations between the referent and another person, which can be the speaker, the addressee, or another third person. Dual and plural pronouns encode the generational relations between or among their referents.

Traditional Onya Darat villages consisted of a single longhouse inhabited by people who were related to each other by blood or marriage. They knew each other intimately, which enabled them to keep track of the exact generational relations between all members of the community. This gave rise to the grammaticalization of these relations and their encoding in the pronominal system. Of course, not every language whose speakers live in small, close-knit communities will go on to encode generational relations in its pronominal system; the vast majority do not. However, a small close-knit community in which generational relationships carry an important social function appears to be a prerequisite for the development of such a system. Onya Darat is unusual not in linguistically expressing kin relations (all languages do so with kinship terms) but in grammaticalizing them into the pronominal system.

Predatory logging by private companies, aided by the Indonesian military and corrupt officials, have led to the large-scale destruction of forests in much of Indonesian Borneo, including in the area inhabited by the Onya Darat. Many

traditional social, cultural, and economic activities have disappeared along with the forests. Younger members of the Onya Darat community are now often forced to seek employment in distant cities. The last of the longhouses have long been dismantled, and their former inhabitants now live in small dwellings similar to those of their Malay neighbours. As traditional communities begin to disintegrate, so does the pronominal system that evolved in them and because of them. Speakers under 30 no longer have full command of the system, and it will probably not survive for much longer.

In Memoriam

Neq Soden (birth name: *Peraq*), c.1920 – 2008
Principal language consultant for the Onya Darat documentation project

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CHAPTER 5

The cultural bases of linguistic form

The development of Nanti quotative evidentials*

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Culture-driven grammaticalization theory posits that cultural influence on linguistic form is mediated by the emergence of communicative practices which increase the frequency of particular lexical items, pragmatic inferences, and patterns of discourse, thereby putting in place a crucial pre-condition for their grammaticalization. The goal of this chapter is to contribute to the development of culture-driven grammaticalization theory by developing an account of the cultural basis for the grammaticalization of quotative evidentials in Nanti, an Arawak language of lowland southeastern Peru. In particular, it is argued that Nanti quotative evidentials grammaticalized from inflected verbs of speaking that achieved high discourse frequencies due to communicative practices that link respectful communicative conduct towards others with the avoidance of speculation about others' actions and internal states. As part of this communicative practice, Nantis largely restrict their discussion of others' actions and internal states to two domains: reported speech regarding others' actions and internal states, and actions that they witnessed themselves, which can also serve to index internal states.

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1.   Introduction

There can be little doubt that social practices and culture affect language; the interesting question is: in what concrete ways are linguistic form and structure shaped by culture, and what are the processes by which culture does so? One approach, culture-driven grammaticalization theory (Simpson, 2002; Evans, 2003), suggests that cultural influence on linguistic form is mediated by the development of conventionalized communicative practices that increase the frequency of particular lexical items, constructions, and pragmatic inferences in discourse, thereby putting in place a crucial pre-condition for their grammaticalization (see also LaPolla, this volume).

The goal of this chapter is to contribute to the development of culture-driven grammaticalization theory by developing an account of the cultural basis for the grammaticalization of quotative evidentials in Nanti, an Arawak language of lowland southeastern Peru. In particular, I argue that Nanti quotative evidentials grammaticalized from inflected verbs of speaking that achieved high discourse frequencies due to the emergence of communicative practices that link respectful communicative conduct towards others with the avoidance of speculation about others' actions and internal states. As part of this communicative practice, Nantis largely restrict their discussion of others' actions and internal states to two domains: reported speech regarding others' actions and internal states, and actions that they witnessed themselves, which can also serve to index internal states.

1.1   Culture and linguistic form

Even linguists committed to treating language as an autonomous cognitive faculty acknowledge that the lexicon of a language is influenced by the culture of its speakers (e.g. Pullum, 1989), and one does not have to look far to find grammatical phenomena that appear related to aspects of social interaction, cultural beliefs, and the local particularities of lived experience. We briefly consider examples of how each of these aspects of culture can come to be expressed in the grammars of particular languages.

To take a well-studied example, systems of honorifics (Agha, 1994, 2007, pp. 301–339) are reported for numerous societies organized on the basis of castes and social classes, but they appear to be quite rare among small-scale 'egalitarian' societies. Honorific systems extend from the comparatively simple European T/V systems (Brown & Gilman, 1960) to the considerably more elaborate systems of East Asia and parts of Oceania (e.g. Errington, 1988; Keating, 1998). The latter type is exemplified by the Korean honorific system, which has been described as expressing six politeness 'levels' by means of verbal suffixes, pronominal alternations, address terms, lexical alternations, and vocative

suffixes (Sohn, 1999; Strauss & Eun, 2005). It is presumably not a coincidence that such honorific systems are found in languages spoken in societies that are hierarchically organized into explicitly recognized groups and display language ideologies that link respect for hierarchically-positioned social others to patterns of language use (Irvine, 1998, p. 62).[1]

Aspects of religious and cosmological beliefs may also come to be encoded in grammar, as in the case of the productive 'demonic' nominal suffix, *-niro*, in Matsigenka (Arawak, Peru). Demons that take the form of animals play an important role in Matsigenka belief systems (see e.g. Johnson, 2003, pp. 208–212),[2] with the names of several important types of demons being derived from animal-denoting nouns with the suffix in question. Thus, in addition to demons that take the form of neotropical species, and are well-integrated into Matsigenka oral tradition, like *osheto-niro* (spider.monkey-demon) 'spider monkey demon', *pantyo-niro* (duck-demon) 'duck demon', demon names derived from more recently introduced domestic animals, such as *waka-niro* (cow-demon; *waka < vaca* 'cow', Sp.) 'cow demon' and *ovisha-niro* (sheep-demon; *ovisha < oveja* 'sheep', Sp.) 'sheep demon' (Lev Michael, field notes).

The locally variable particulars of lived experience can also come to be encoded in grammar, as in the case of grammatical resources related to spatial navigation of the local physical environment (see Palmer, this volume and Frowein, this volume). Thus we find that in the case of Iquito (Lai, 2009, pp. 346–352), for example, spoken by individuals living in the dense forest of the Amazonian floodplain, verbal associated motion suffixes express associated upriver and downriver motion, as in (1a–b), rather than the inclination-relative systems found in mountainous areas of the world (see e.g. Diessel, 1999, pp. 42–43).

(1) a. *Nu-maki-wɨɨ-kura*
         3SG-sleep-ASSOC.MOT:upriver-REC.PAST
         'S/he slept upriver (and has since returned).'

     b. *Nu-maki-kʷaa-kura*
         3SG-sleep-ASSOC.MOT:downriver-REC.PAST
         'S/he slept downriver (and has since returned).'

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1. Yum (1988) argues that the deference systems found in East Asian languages can be traced to the influence of Confucianism, which is plausible, given the manner in which the intersection of religious identity and language ideology affected the English T/V system (Silverstein, 1985).

2. As Johnson (2003, p. 208) puts it: "[T]he Matsigenka world is populated by a host of horrible, lethal demons, who, being generally invisible, could be almost anywhere. Demons tend to be exaggerated versions of humans or animals, usually deformed, defective, and disgusting in some way."

Although examples like these strongly suggest that social and cultural practices affect linguistic structure, progress beyond this basic observation depends on developing theoretical frameworks that help linguists generate explicit accounts of how social and cultural factors are implicated in linguistic structure. One promising approach of this type, the *culture-driven grammaticalization* (CDG) framework, relates linguistic form to social and cultural factors via processes of grammaticalization. The basic insight of CDG is that culture and social processes shape discourse (i.e. actual language use), and in doing so, affect the token frequency (and contingent syntagmatic relationships) of particular linguistic forms (Simpson, 2002), which plays a major role in their grammaticalization (Bybee, 2003, 2006; Bybee & Hopper, 2001). On this view, culture affects linguistic form and structure indirectly, through its capacity to influence grammaticalization processes.

In this chapter I aim to build on previous work in culture-driven grammaticalization theory (CDG) in two ways. First, I seek to more explicitly ground the CDG framework in social theory by linking grammaticalization theory to practice theory, an important approach to social theory that exhibits certain deep similarities to grammaticalization theory. Both grammaticalization theory and practice theory are grounded in accounts of conventionalization and automatization of behaviour, providing the basis for a common framework for theorizing social and linguistic phenomena within CDG. Second, I present a case study, the grammaticalization of quotative evidentials in Nanti, cast in this common framework. Specifically, I argue that Nanti ideologies regarding the appropriateness of making claims about the actions and subjective stances of others serve as perduring structuring factors that favour communicative practices with a particularly high density of reported speech constructions. In particular, Nantis generally consider direct reference to others' internal states and speculation about others' actions to be inappropriate in most circumstances, motivating the use of reported speech to talk about others' intentions, emotional states, and evaluative stances, and the use of evidential strategies, including reported speech, to talk about their actions. The resulting high frequency of reported speech constructions in turn drives the grammaticalization of verbs of speaking into quotatives. In this way, Nanti communicative practices that disfavour direct reference to the internal states of others, or speculation about their actions, indirectly drive the grammaticalization of linguistic resources that facilitate indirect reference to these crucial dimensions of Nantis' social worlds. Nanti society and language present an especially valuable context for studying the social factors behind the grammaticalization of evidentials because Nanti quotatives and reportives are currently undergoing grammaticalization. As such, we can be optimistic that the broader communicative practices that gave rise to their grammaticalization are still present in the society,

and further, that the social factors driving the conventionalization of those communicative practices are still present.

1.2 Linguistic and ethnographic background

Nanti is an Arawak language of the Kampan branch, a group of head-marking agglutinative languages spoken in the Andean foothills of southeastern Peru, and in the adjacent lowlands of Peru and Brazil. Nanti is spoken by approximately 450 individuals who live in some ten settlements on the upper Camisea and Timpía Rivers. The Kampan varieties are involved in several dialect chains, posing difficulties for classification (Michael, 2008, pp. 212–219). Nanti itself is sometimes treated as a distinct language (e.g. Payne, 2002), and sometimes as a dialect of Matsigenka. Matsigenka itself is dialectally diverse, and I believe that Nanti may most accurately be thought of as an extreme point in a dialect chain linking the following dialects of Matsigenka: Upper Urubamba – Lower Urubamba – Manu – Nanti, where neighbours in the chain are more similar than non-neighbours. Mutual intelligibility between the Manu Matsigenka and Nanti varieties is relatively high, especially when speakers of these different varieties speak slowly and employ relatively simple grammatical structures, but is relatively low between Nantis and speakers of the Upper Urubamba River dialect. Nantis are overwhelmingly monolingual, although a handful of young men have developed a basic knowledge of Spanish in recent years.

Present day Nantis are hunter-horticulturalists, much as their parents were, although contact with non-Nantis has resulted in significant changes to Nanti material culture and social organization. According to Nanti oral history, significant interaction with non-Nantis dates to the 1970s (for details, see Michael 2008: 24–26). At that time, Nantis lived entirely on the upper Timpía river, in a dispersed settlement pattern of small communities of 10–30 individuals, which were typically separated by at least half-a-day's walk from their nearest neighbours. In the mid-1980s, Nantis began to migrate from the Timpía River basin to the neighbouring Camisea River basin, drawn by the richer land in the Camisea basin, and the prospect of metal tools. Nantis initiated contact with Matsigenkas in the early 1990s and soon thereafter the community of Montetoni was formed, which at its peak had 250 inhabitants – over half of the entire Nanti population. Since then, most of the Nantis living in the Camisea River basin have experienced a completely novel degree of contact with relative non-intimates (i.e. individuals who do not form part of their own extended families). I have argued elsewhere (Michael, 2008) that two new social institutions emerged in this context as social solutions to some of the challenges posed by the large, multi-family settlements: the position of community chief and large-scale manioc beer feasts. Nantis have avidly

incorporated metal tools into their subsistence practices, but there is considerable continuity with pre-contact practices: bow-and-arrow hunting and small-scale horticulture of manioc, other tubers, plantains, and corn remain important.

This chapter is based on twenty months of monolingual ethnographic and linguistic fieldwork between 1998 and 2006. I carried out the vast majority of this work in Montetoni, the largest of the Nanti communities. My work in these communities focused on the analysis of recordings of naturally-occurring conversation (~300 hours) and on systematic ethnographic observation grounded in intensive participant observation. During each of my visits I lived with my wife and research partner, Christine Beier, in one of the village's several 'residence groups', as we called the clusters of households whose residents cooperate in subsistence activities. As members of a residence group, we participated in subsistence activities with other members of the group, and I exchanged daily inter-household visits with households inside and outside the group, as male heads of households are expected to do. Our most intense social experiences, however, were the weekly multi-day manioc beer feasts, the most important context for social interactions beyond the bounds of each villager's residence group. In this intense monolingual environment we had little alternative but to develop a reasonable mastery of Nanti grammar and Nanti communicative norms, and this understanding underlies much of my description of Nanti communicative practices in this chapter.

2.   Towards a sociocultural theory of linguistic form

The significant empirical and theoretical successes of linguistics over the last century are due in no small part to the adoption of a structuralist[3] perspective on linguistic phenomena. The insight that animates structuralism is the realization that many linguistic phenomena can be fruitfully analysed solely in terms of relationships between linguistic elements, without reference to the social contexts in which they are used, or the motivations of the people who employ those elements. Treating language as an autonomous system in this way has yielded a tremendously productive focus on linguistic form as an analytical object, but it has also had the less welcome collateral effect of inhibiting the development of theories regarding

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3.   I construe the term *structuralist* broadly here, including self-identified forms of structuralist linguistics as well as later schools, especially the generative tradition, that further developed the notion of structural autonomy.

the role of social action and culture in the emergence of linguistic form.[4] My goal in this section is to show that although theories of the latter type are underdeveloped in comparison to structuralist theories, foundations have nevertheless been laid in both social and linguistic theory for a socially grounded theory of linguistic form. In particular, the parallel development of practice theory and grammaticalization theory in social and linguistic theory, respectively, has yielded converging perspectives on patterned regularities in human activity that constitute a promising basis for approaches to language that allow linguists to take advantage of the very real strengths of structuralist thought, without committing them to its asocial and ahistorical view of language.

One way to appreciate the utility of such an approach is to recognize that a significant obstacle to theorizing the role of social and cultural processes in the development of linguistic form is a simple lack of congruence between the phenomena, units of analysis, and explanatory mechanisms of social theory, on the one hand, and those of linguistic theory, on the other. In speaking of their objects, for example, social theories refer to phenomena such as (social) gender, taboo avoidance, and social conflict; units such as families, clans, and social classes; and explanatory mechanisms such as material and symbolic exchange, social power, and ideology. Linguistics, in contrast, is concerned with phenomena such as speech sounds, word structure, and word order; units such as phonemes, phrasal constituents, and sentences; and explanatory mechanisms such as feature assimilation, morpheme-ordering principles, and long-range syntactic dependencies. In part this lack of congruence has, to be sure, legitimate empirical roots – after all, vowel harmony and gift exchange are qualitatively quite different phenomena – but the structuralist elimination of *action* in structuralist linguistic theories, so central to our understanding of social processes, in favour of formal relationships between elements, introduces a conceptual gulf between linguistic and social theory that is difficult to bridge.

The convergent perspectives of practice theory and grammaticalization theory, however, present an opportunity for bridging this gap, grounded in the similar understanding of patterned regularities in human activity shared by the two theories, namely that they arise through time through the *sedimentation* of actions (some of which are novel or innovative). In practice theory, the focus lies on the sedimentation of activities into social practices, i.e. routinized ways of 'doing and saying' (Schatzki, 1996), while in grammaticalization theory the focus lies on

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4.   Weinreich, Labov, & Herzog (1968) make a similar point, of course, and the variationist sociolinguistic tradition launched by their seminal work represents an important effort to overcome the isolation of linguistic form from social activity.

grammaticalization, i.e. the development of linguistic structure from patterns of language use immanent in discourse. Although divergent in their empirical concerns and disciplinary vocabulary, both theories are ultimately concerned with processes of routinization and automatization of activity, providing a common basis on which to theorize social and linguistic phenomena.

Assuming that readers are familiar with grammaticalization theory, I wish to briefly sketch some relevant key elements of practice theory. Although the roots of practice theory can be traced back to the ordinary language philosophy of Wittgenstein's later work and the phenomenology of Heidegger (Reckwitz, 2002), the emergence of practice theory is typically associated with Pierre Bourdieu (1977) and Anthony Giddens (1979, 1984), both social theorists who sought to overcome a number of dichotomies that persistently bedevilled social theory. These included the paradox of individual agency against the backdrop of overdetermining social structure, the distinction between intellectual meta-discursive knowledge and practical knowledge, and the difficulties in theorizing the relationship between micro- and macro-social organization, as well as between social synchrony and diachrony.

Practice theorists' response to these difficulties was to abandon the notion of social structure as a theoretically primary entity, but instead place the activities of embodied social agent, immersed in a web of interactions with other agents and with material objects, at the centre of social theory. Social 'structure', on this view, emerged from the regularities of the social practices in which social agents participate during their strategic navigation of the social and material world in the furtherance of their particular projects. 'Practices', from this perspective, are understood to be routinized ways of acting in the world, where 'action' encompasses both the physical and cognitive dimensions of action.

Practice theory posits that practices emerge through the interaction of individuals' predispositions to act in certain ways, and those individuals' socially situated, interested, and agentive pursuit of individual goals under the material and social circumstances in which they find themselves. In practice theory, these predispositions are attributes of the *habitus*, which is understood to be comprised of sets of flexible, schematic dispositions, a 'sense of the game' that guides the individual's action in given social and material contexts:

> […] habitus [consists of] systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles of the generation and structuring of practices and representations which can be objectively "regulated" and "regular" without in any way being the product of obedience to rules.   (Bourdieu, 1977, p. 72)

Several writers have compared the habitus to grammar – and even to generative grammars – as a set of productive schemas that underpin regularities in behaviour, while at the same time permitting creativity and flexibility (e.g. Wacquant, 2004).

Practice theorists have been hesitant to describe the habitus, or even parts of the habitus, to the degree of explicitness with which linguists are used to treating their subject matter, but the notion of scripts and schemas developed by artificial intelligence researchers, such as Schank & Abelson (1977), gives some idea of how the notion of habitus could be cashed out.

Crucially, and this is where the bridge to grammaticalization theory becomes evident, practice theorists understand the habitus to develop or accrete through activity itself – that is, as a result of repeated experience with particular trajectories of actions in concrete material and social contexts – thereby introducing a diachronic dimension to the production, reproduction, and transformation of social practices. It is this diachronic aspect of practice theory, namely, that habitus both generates practices in concrete social and material contexts, and results from the sedimentation of the activities comprising those practices, that allows practice theory to bridge a number of the thorny theoretical divides mentioned above.

The fact that language forms a part of many practices brings practice theory even closer to grammaticalization theory. Since speakers attempt to achieve similar socio-communicative goals in recurring social situations, particular *communicative practices* (Hanks, 1996), consisting of discursive routines and conventionalized communicative strategies, sediment as parts of speakers' *communicative habitus*. The communicative practices generated by the interaction of (multiple) speakers' communicative habitus in concrete social and material settings vary considerably in scale, from discourse genres (Hanks, 1987; Urban, 1991), to interactional routines such as commercial interactions (Clark, 1992) and ritual greetings (Beier, Michael, & Sherzer, 2002), to micro-interactional practices such as reference (Hanks, 1990). It is important to understand that these communicative practices are not to be understood merely as types of 'language use' in 'social context', but rather as integrated practices in which the deployment of linguistic form forms a piece with practical modes of social action, perception, and judgment aimed at achieving the interested goals of social agents. Communicative practice exhibits the practical integration of linguistic resources in social action in the pursuit of social goals, generated by and sedimented in the habitus in a manner that links particular dispositions for social action to the deployment of particular linguistic resources (e.g. lexical, discursive, and grammatical). And it is precisely here that the continuity between practice theory and grammaticalization theory is clearest, since both theories treat the emergence of patterned regularities in their respective domains of human activity as a consequence of routinization via the cumulative effects of repeated action and experience (Bybee & Hopper, 2001, p. 2; Evans, 2003, p. 16). Grammaticalization theory can in fact be seen as a special limiting case of practice theory, concerned with emergence of highly routinized aspects of communicative conduct (i.e. grammar) from the more contingent, yet nevertheless regular aspects, of discourse.

The unified picture, stretching from social activity to grammar, that emerges from the continuity between practice theory and grammaticalization theory thus centres on social practices – including communicative ones – and the processes of sedimentation in habitus formation that lead to the reproduction and transformation of social practices. Since language constitutes part of these practices, part of the sedimentation in question involves the sedimentation of patterns of deployment of linguistic resources in the context of broader social practices. The communicative practices that emerge from this process of sedimentation have as their limiting case of routinization and regularization the phenomena of concern to grammaticalization theory: the development of linguistic structure from regularities in discourse. Crucially, in the context of practice theory, grammaticalization processes are immersed in broader communicative and social practices, so that grammaticalization can be seen to be no less a 'social' process than any other aspect of habitus formation. On this view, then, 'culture' and the 'social world' are understood to affect grammar through social practices, and communicative practices in particular, that integrate the patterned and routinized deployment of linguistic resources with trajectories of social action, feeding grammaticalization. The routinization characteristic of communicative practices entails that certain elements and collocations become particularly frequent in the context of communicative activity, at which point frequency effects of the type that concern grammaticalization theory manifest themselves, including phonological reduction, loss of prosodic or morphosyntactic independence, semantic bleaching, and the like (Hopper & Traugott, 2003). In summary, the vision of the relationship between grammar and the social that emerges from this unified picture is less one of a process of *culture-driven grammaticalization*, which presupposes clearly distinct spheres of 'culture' and 'language', as much as one of sedimentation of activities that integrate communicative and non-communicative components, one consequence of which is the extreme routinization found in grammaticalization.

3. Quotative evidentials and reported speech constructions

This section is devoted to Nanti quotative evidentials[5] and the lexical reported speech constructions from which they grammaticalized.

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5. Since the term *quotative* is employed somewhat inconsistently in the literature, I here define *quotative evidentials* as reported speech constructions that provide information about the *source* of the reported speech but not its recipient (see Michael, 2012, for further discussion).

3.1 Lexical quotative constructions

Nanti lexical quotative constructions are complement clause constructions in which the matrix verb *kant* 'say' takes reported speech complements that can either precede the verb, as in (2), or follow it, as in (3).[6] The matrix verb typically appears in the minimally inflected realis imperfective form, as in (2) and (3), but can also bear additional morphology, as in (4). All deictic elements in lexical quotative constructions reflect the indexical parameters of the reported situation, which is characteristic of direct speech reporting (cf. Munro, Ludwig, Sauerland, & Fleck, 2012).

(2) *Ikanti tsame, tsame, nonamanakempi.*
i=kant-Ø-i   *tsame*   *tsame*
3ms=say-IMPF-REAL.I   lets.go   lets.go

n-am-an-ak-e=mpi
1S=IRR-bring-ABL-PERF-IRREAL.I=2O

'He said, "Let's go, let's go, I will bring you there." '

(3) *Aka pimporohake ikanti maika.*
aka   *pi=n-poroh-ak-e*   *i=kant-Ø-i*   *maika*
here   2S=IRREAL-clear.land-PERF-IRREAL.I   3ms=say-IMPF-REAL.I   now

' "Please clear land here," he said now.'

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6. The orthography employed in the examples in this chapter is phonemic and largely self-explanatory; coda nasals assimilate to the place of articulation of the following voiceless stop, and the *i*-class realis suffix -*i* surfaces as -*e* following the perfective -*ak*. The first line of interlinearized examples shows the effects of morphophonological processes, including vowel hiatus resolution and epenthesis; the epenthetic consonant *t* and epenthetic vowel *a* are included in this line but are not segmented or glossed in other lines. The following morpheme abbreviations are used: 1S, 1st person subject; 1O, 1st person object; 2S, 2nd person subject; 2O, 2nd person object; 3mS, 3rd person masculine subject; 3mO, 3rd person masculine object; 3fS, 3rd person feminine subject; 3fO, 3rd person feminine object; 1P, 1st person possessor; 2P, 2nd person possessor; 3mP, 3rd person masculine possessor; 3fP, 3rd person feminine possessor; ABL, ablative; ADL, adlative; APPL:PURP, purposive applicative; CAUS, causative; CL, classifier; CNTF, counterfactual; COND, conditional; DEONT, deontic; DIRREAL.I, doubly irrealis, i-class verb; DSTR, distributive; FRUS, frustrative; HAB, habitual; IMPF, imperfective; IRREAL.A, irrealis, A-class verb; IRREAL.I, irrealis, i-class verb; LOC, locative; MAL.REP, malefactive repetitive; NEG.IRREAL, irrealis negation; NEG.REAL, realis negation; PASS.IRREAL, irrealis passive; PASS.REAL, realis passive; PERF, perfective; PL, verbal plural; REAL.A, realis, A-class verb; REAL.I, realis, i-class verb; REG, regressive; SUB, subordinator.

(4) *Ikantahigakera hara tsinane apahiri.*
    i=kant-hig-ak-i=ra   *hara*   *tsinane*
    3ms=say-PL-PERF-REAL.I=TEMP NEG.IRREAL woman

    a=p-ah-i=ri
    1.PL.INCL=give-REG-REAL.I=3mo
    'At that point they said, "We will not give him a woman."'

3.2 Quotative evidentials

Nanti quotative evidentials are transparently grammaticalized from inflected forms of the verb *kant* 'say', as evident in Table 1. These evidentials retain in frozen form the person prefixes borne by the inflected verb from which they grammaticalized; this person information indexes the source of the quoted utterance, as in (5) and (6). Quotative evidentials are clausal proclitics that immediately precede the speech report with which they are associated, and unlike the verb of saying from which they grammaticalized, they cannot follow the speech report.

Table 1. Nanti quotatives and their lexical sources

quotative	gloss	source	gloss
nóka	QUOT.1	*nokánti*	'I say'
píka	QUOT.2	*pikánti*	'you say'
íka	QUOT.3m	*ikánti*	'he says'
óka	QUOT.3f	*okánti*	'she says'

(5) *Oka ipokahi.*
    oka   *i=pok-ah-i*
    QUOT.3f 3ms=come-REG-REAL.I
    'She says, "He has returned."'

(6) *Ika tera nogote.*
    ika   *tera*   *no=ogo-e*
    QUOT.3m NEG.REAL 1s=know-IRREAL.I
    'He said, "I don't know."'

Since Nanti quotative evidentials so closely resemble the verbs from which they grammaticalized, it is important to specify the semantic and syntactic evidence for their grammaticalization, especially since one might wonder whether they are simply truncated fast speech forms of the corresponding inflected verbs.

    Important evidence that Nanti quotatives are not truncated fast speech forms comes from the stress pattern of quotatives. Crucially, truncated fast speech forms in naturally-occurring Nanti discourse preserve the stress pattern of the

non-truncated forms, as if truncation occurred subsequent to stress assignment. Quotatives, however, exhibit the stress pattern of disyllabic words, and not the stress pattern we would expect of truncated disyllabic versions of the verbs from which they grammaticalized.

Nanti exhibits a stress system of default left-to-right iambs with final extra-metricality (Crowhurst & Michael, 2005), as exhibited in the non-truncated form in (7a).[7] Truncated fast speech forms generally involve the deletion of unfooted syllables, as in (7), and as we can see, truncated forms retain the stresses of the corresponding full forms, and not the stress pattern that would be assigned to the truncated form on the basis of its surface form, given in (7).

(7) a. *(non.ká)(mo.sò)⟨te⟩*
         'I will visit'

     b. *nonkámosò*

     c. **(non.ká)mo⟨so⟩*

The truncated form of the first person inflected form of the verb, given in (8b), exhibits final stress, as expected from the full form given in (8a), while the quotative exhibits initial stress, as in (8c). Quotatives thus exhibit the stress pattern of free disyllabic forms, rather than that of a truncated disyllabic form of a longer word, indicating that they are now distinct from the verbs of saying from which they grammaticalized.

(8) a. *(no.kán)⟨ti⟩*
         'I say' (full form)

     b. *noká*
         'I say' (truncated fast speech from)

     c. *(nó)⟨ka⟩*
         QUOT.1

It should also be noted that in fast speech, quotatives are often completely destressed, as in (9), suggesting that they are on their way to becoming phonologically dependent on adjacent elements, evidence of their continuing grammaticalization.

(9) *Ika tera.* [ikatéɾa]
     ika   tera
     QUOT.3m NEG.REAL
     'He says "No."'

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7. In the following examples, parentheses indicate foot boundaries, while angle brackets indicate extrametrical syllables.

Nanti quotatives also differ semantically and syntactically from the lexical items from which they grammaticalized, in that they have different scopal properties and are developing complementizer functions. It has been found that cross-linguistically, evidentials, unlike lexical verbs, typically cannot fall under the scope of negation (Aikhenvald, 2004; Willett, 1988). Helpfully, we find that in Nanti, verbs of saying can be in the scope of negation, as in (10), but that quotatives cannot, as in (11), suggesting that Nanti quotatives are evidentials, and are grammatically distinct from their original lexical sources. Note that negation can be within the scope of quotatives, as one would expect, as in (12). Nanti quotatives and the inflected forms of *kant* 'say' from which they grammaticalized have also developed subtly different pragmatic properties, with the inflected verbs now yielding implicatures of illocutionary commitment (Michael, 2012).

(10)   *Tera nonkante nohate.*
        tera   no=n-kant-e   no=ha-e
        NEG.REAL 1s=IRREAL-say-IRREAL.I 1s=go-IRREAL.I
        'I do not say "I will go."'

(11)   **Tera noka nohate.*
        tera   noka   no=ha-e
        NEG.REAL QUOT.1 1s=go-IRREAL.I
        Intended: 'I did not say "I will go."'

(12)   *Noka tera nohate.*
        noka   tera   no=ha-e
        QUOT.1 NEG.REAL 1s=go-IRREAL.I
        'I say "I will not go."'

Nanti quotatives are also developing complementizer functions, as evident in constructions where they intervene between reported speech complements and verbs of communication. Most verbs of communication which serve as matrix verbs in such constructions, such as *kenkitsa* 'narrate' in (13) and *kahem* 'yell' in (14), cannot take reported speech complements without a quotative, suggesting that the quotative licenses the reported speech complement. Note that it is ungrammatical to replace the quotative in its complementizer function with an inflected form of the lexical verb *kant* 'say'.

(13)   *Nokenkitsatake **noka** nogonkehata Shampinkihari.*
        no=kenkitsa-ak-i   noka
        1s=tell.story-PERF-REAL.I   QUOT.1

        no=gonke-ha-∅-a   Shampinkihari
        1s=arrive-CL:water-IMPF-REAL.A   place.name

        'I narrated, "I arrived in Shampinkihari by river."'

(14)   *Ikahemake **ika** tahena aka.*
       i=kahem-ak-i   ika   tahena   aka
       3ms=yell-PERF-REAL.I QUOT.3m come.IMP here
       'He yelled, "Come here!"''

Interestingly, one also finds occasional naturally-occurring instances of *kant* 'say' taking quotative-marked reported speech complements, as in (15), suggesting that the reported speech complement licensing function may be generalizing to all verbs of communication.

(15)   *Tera nonkante **noka** nohate.*
       tera   no=n-kant-e   noka   no=ha-e
       NEG.REAL 1S=IRREAL-say-IRREAL.I QUOT.1 1S=go-IRREAL
       'I did not say "I will go."''

There is also evidence of an incipient extension of the complementizer function to verbs of cognition, such as *pintsa* 'decide', as in (16).

(16)   *Nopintsatake **noka** nontime aka.*
       no=pintsa-ak-i   noka   no=n-tim-e   aka
       1s=decide-PERF-REAL.I QUOT.1 1S=IRREAL-live-IRREAL.I here
       'I decided to live here.' (lit. 'I decided 'I will live here.'' ')

Finally, it is important to note that Nanti quotatives have clearly grammaticalized recently. Nanti quotatives show relatively little sign of phonological erosion, even retaining in frozen form the person marking borne by the verbs from which they grammaticalized. And tellingly, closely-related Matsigenka dialects do not exhibit quotative evidentials (Mary Ruth Wise, p.c.; Lev Michael, field notes). Since Nanti and the Manu dialect of Matsigenka (the dialect most closely-related to Nanti), separated at most 200–300 years ago, the emergence of Nanti quotatives presumably post-dates that split.

4.   Reported speech in Nanti communicative practice

In this section I discuss important social considerations influencing Nantis' use of reported speech constructions, and argue that these constructions play a crucial role in Nanti communicative practice by allowing speakers to talk about others in socially appropriate ways. In particular, I argue that maintaining respectful stances towards interlocutors is an important thread running through Nanti communicative practice, and that this centrally involves avoiding verbal speculation about the actions and internal states of others. This practical understanding of appropriate communicative activity manifests not only in refraining from imputing

actions and internal states to others on the basis of conjecture or speculation, but in explicitly indicating the means by which one has knowledge of others' actions and internal states. This 'evidential ethic' leads to a significant reliance on reported speech constructions, since verbal reports are one of the principal means by which Nantis learn about others' actions and internal states.

It is important to note that Nantis do not avoid speculation regarding others' actions and internal states in a mechanical or rule-like fashion; the communicative practices I describe here reflect a practical understanding of respectful social conduct in a social field structured by asymmetrical relationships and intimacy. In fact, as I will show below, the circumstances in which the typical evidential ethic breaks down give us insight into the social motivations behind the ethic.

4.1   Talking about others' actions

I begin by describing the Nanti evidential ethic as it applies to talking about others' actions. Conversations about subsistence activities are a staple of Nanti verbal life, and are a rich source of everyday examples of Nantis' reliance on reported speech as a means for talking about others' actions. It is rare in such conversations for anyone to talk about the subsistence activities of others without explicitly indicating the basis of their knowledge about that person's activities, typically by resorting to reported speech, as in the brief conversation presented in (17).

This interaction took place between me and Maroha, one of my nearest neighbours, when I dropped by one afternoon to visit Bikotoro, her brother and one of my closest friends in the community. The only action that Maroha attributes to Bikotoro without recourse to reported speech is the one she witnessed (his departure), and she conveys his intention, and information about his destination, by reporting his speech as he left the household. Note that this is a very mundane conversational exchange, and that Maroha is not being cagey or evasive by Nanti communicative standards.

(17)   a.   Lev: *Ainyo Bikotoro?*
                         'Is Bikotoro (here)?'

       b.   Maroha: *Ma, ikena* [gesturing downriver].
                         'He isn't (here), he headed (down there).'

       c.   Lev: *Tya ihati?*
                         'Where did he go?'

       d.   Maroha: **Ika** *kara nontsagate.*
                         'He said, "I'm going fishing over there."'

       e.   Lev: *Ari ihatake?*
                         'So, he went off?'

       f.   Maroha: *Hee, ika nontsagate.*
                         'Yes, he said, "I will fish."'

A similar reliance on reported speech can be found in most discussions of already realized activities. In the following exchange, an elderly man in my residence group, Hoshi, and a young man from a neighbouring residence group, Saoro, briefly discuss the young man's father, Hosukaro, who is known as one of the best hunters in Montetoni. Saoro reports on his father's newsworthy killing of a tapir exclusively through reported speech, first of his father, and then of his mother, Hororinta, who was with his father when they chanced upon the tapir.

(18) a. Hoshi: *Pokahi piri?*
                 'Is your father back?'

      b. Saoro: *Hee, **ika** nonehanake kemari.*
                 'Yes, he said, "I saw a tapir."'

      c. Saoro: *Impo nonehake ina, **oka** ikentakero kemari.*
                 'Then I saw my mother, she said, "He shot the tapir." '[8]

When Nantis have neither seen a person engaging in the relevant subsistence activity, nor have a speech report to rely on, they generally respond to inquiries by saying so, as in the brief interaction given in (19). In this interaction, Migero, the chief of the settlement of Montetoni, asks a young woman, Marota, about the location of her husband. Marota responds by saying that her husband did not indicate where he was going, and she does not speculate about where he went. Such avoidance of speculation is typical in interactions of this type, as is the fact that her interlocutor does not prompt her to speculate.

(19) a. Migero: *Yoga pikoriti?*
                 'Your husband?'

      b. Marota: *Ma.*
                 'He's not around.'

      c. Migero: *Tya ihati?*
                 'Where did he go?'

      d. Marota: *Te inkante.*
                 'He didn't say.'

      e. Migero: *Te inkante? Te pinehe?*
                 'He didn't say? You didn't see (him)?'

      f. Marota: *Te nonehe. Te inkante. Nokamosotake kara.*
                 'I didn't see. He didn't say. I was visiting over there.'

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8. It might seem surprising that Hosukaro himself did not tell his son that he had shot the tapir, but taboos surrounding hunting require that Nanti hunters, having made a kill, distance themselves from it, neither carrying it back nor speaking directly about it until at least a day has passed.

My fieldwork in the Nanti communities uncovered relatively little metadiscursive commentary on the (in)appropriateness of speculation regarding others' actions (other than critiques of *parikoti* speech, discussed below), but one interaction that I initiated served to reveal the strength of Nantis' (typically unexpressed) attitudes towards this issue. I noticed the rarity of overt speculation in Nanti discourse early during my fieldwork in the Nanti communities, and in seeking to better understand the phenomenon, I invited people to speculate, typically to little effect. However, a conversation with my friend Teherina that touched on the subsistence activities of his various relatives on that day yielded a rather different outcome. In the course of this conversation, Teherina remarked that his brother Berene and his family were not at home, leading me to ask where they were. He indicated that he did not see them off, nor had anyone else told him what they were doing, and I – still not fully attuned to appropriate communicative conduct under those circumstances – encouraged him to speculate on their destination by asking if Berene might be off doing one activity or another, cycling through a number of possible – indeed probable – candidate activities. Teherina responded to each query by repeating that he did not know what Berene was doing, that he had not seen the family leave, and that no one had told him where they had gone. Teherina displayed mounting impatience as I continued to inquire until he finally, and quite uncharacteristically, snapped at me, saying that he couldn't tell me what Berene and his family had gone off to do until they returned and told him, and that he would tell me as soon as he knew. It was belatedly clear to me that my efforts to encourage Teherina to speculate were not welcome. Significantly, I found Nanti individuals to be extremely patient in responding to my inquiries on a wide range of topics, and this is one of the small number of instances in which a Nanti individual lost patience with me.

It is worth noting, in light of this discussion of the Nanti evidential ethic, that Nanti individuals are typically also careful not to lead others to believing that their knowledge of some state of affairs is more direct than it in fact is, as exemplified in the brief interaction given in (20). In this conversation with Habihero, I brought up the fact that I had seen his classificatory brother Pasotoro fletching arrows with eagle feathers, leading to the following exchange.

(20) a. Lev: *Chapi nonehake hanta Pasotoroku oga chakopi yoga …*
          yotugatakero.
          'Yesterday I saw over there at Pasotoro's he was … fletching
          an arrow.'

      b. Habihero: *Yotugataje, pinehake chapi Pasotoro yotugatake. Pinehahi?*
          'Fletching, yesterday you saw Pasotoro fletching. Did you
          see (well)?'

c. Lev: *Hehe. Onti ashi oga pakitsa ibanki.*
    'Yes. They were eagle feathers.'

d. Habihero: *Pakitsa oga, omarane kara* [gesturing].
    'It was an eagle, big, here (gesture indicating wingspan).'

e. *Ikentake, ikentahigake aka* [gesturing].
    'He shot, they shot (it) here (gesture indicating where in the body the eagle was wounded).'

f. *Chapi oga aka* [gesturing] *opoki.*
    'It came here (gesturing towards the river) yesterday.'

g. *Te nonehe inkente.*
    'I did not see him shoot (it).'

h. *Te nonehe inkente.*
    'I did not see him shoot (it).'

It turned out that the eagle had been killed near the village the day prior, and that Habihero had arrived on the scene shortly after Pastoro had killed the eagle, and seen its body. Note that in this strip of talk, Habihero at no point asserted anything other than what he knew by virtue of seeing the eagle's body, but nevertheless sought to clarify that he did not witness Pasotoro shooting the eagle.

4.2   Talking about others' internal states

Nantis rarely directly attribute internal states to others, relying instead on reports of actions which index internal states, or on speech reports by which individuals reveal their internal states to others. This phenomenon is nicely illustrated by the interaction in (21), in which I asked Esekera whether his brother, who had recently moved from the adjacent Timpía River basin, intended to live in Montetoni or in the smaller upriver settlement of Pirihasanteni. In his response, Esekera conveys his brother's intentions and desires but at no time directly attributes them to his brother as internal states. His brother's intentions are indexed by verbal commitments to particular courses of action, and his desires are revealed through reported speech in which he explicitly expresses his own desires.

(21) a. Esekera: **Ikanti ika** *aka* **noka** *nokogantaka aka maika.*
          'He (i.e. Esekera's brother) says, "Here (i.e. in Pirihasanteni) I say is where I want (to live) now."'

      b. **Nokanti** *yonta ainyo peresetente.*
          'I say, there (in Montetoni) there is a leader.'[9]

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9.   Esekera's response here is to be understood as an argument in favour of living in Montetoni, rather than in Pirihasanteni.

c.	***Ika, ika***, *hara notimi aka.* 'He says, he says, I will not live there.'
d.	***Ika*** *nokantatsi Pirihasanteni.* 'He says, 'I will remain in Pirihasanteni.'
e.	*Ari* ***ikanti***. 'Indeed he says (that).'
f.	*Hee, ari* ***ikanti*** *nontime Pirihasanteni.* 'Yes, indeed he says, "I will live in Pirihasanteni."'
g.	*Ari maika nontimake Pirihasanteni.* "'Indeed, now I will live in Pirihasanteni."'

One could easily imagine that in a speech community in which direct reference to internal states is more common, the desires and competing beliefs about the preferred courses of action would have been described as 'wanting', 'preferring', or 'believing', but as is typical of Nanti communicative interactions, these internal states were indexed by reported speech. Note that means do exist in Nanti for expressing internal states, principally the verbs *kog* 'want', *pintsa* 'decide', and, *sure* 'think, believe'. An example of the first person use of *sure* 'think, believe' is given in (22).

(22)	a.	Tekori:	*Pere ikanti tyatika kutagiteri nonkamosote Kirigeti.* 'Pere said, "Someday soon I will visit Kirigeti."'
	b.		*Impo nokantake nonkamosote, no**sure**tapahi nohate nonkamosote.* 'Then I said, "I'll visit (too)," I had the idea that I would go and visit.'
	c.		*No**sure**tapahi ariorika nagabehake nonkamosote.* 'I had the idea that perhaps I could visit.'

4.3   Conflict, intimacy, and the evidential ethic

Communicative practices, like practices more generally, are not the outcome of rigid adherence to rules, but rather emerge from the embodied, practical sense of how the social-communicative game is played. In addition to the regularities described above, then, communicative practices also manifest improvised and strategic actions in the social field, requiring that an adequate description of communicative practices encompass an account of ways in which speakers strategically subvert the norms that typically guide them. Understanding how, and under what circumstances, Nantis deviate from the normative picture sketched above is crucial for developing an adequate analysis of the communicative practices described here.

Two kinds of socio-interactional configurations account for most of the cases I have witnessed in which the manner in which Nantis speak about others' actions and internal states diverges from the account presented thus far. The first such configuration involves contentious or adversarial interactions, in which one participant is considerably more socially powerful than the other.

An example of this type of interaction involved Migero, the leader of Montetoni, and Ariponso, a visitor from another community who had visited briefly with the goal of obtaining valuable metal trade goods and then leaving. In this interaction, Migero was very critical of Ariponso's behaviour, since it contravened a central political philosophy that Migero had developed and explicitly articulated as a leader, namely, that the material benefits of living in Montetoni (e.g. metal trade goods) are intrinsically tied to a moral commitment to the community as a joint social project. In the strip of interaction in (23), Migero not only directly refers to Ariponso's thoughts (*pisuretakaro* 'you thought it'), but he also actually overtly attributes to Ariponso thoughts that the latter never revealed as such, a striking divergence from typical Nanti communicative practice.

(23) a. Migero: *Chichata birompatyo pisuretakaro chichata pimpokake.*
'Of your own will, be it on your head, you thought by yourself to come (here).'

b. *Biro nonehake pipokake aka.*
'I see that you have come here.'

c. *Oka pisuretakaro, pisuretaka aka pashikarontsi, hacha, kotsiro.*
'You thought of it, you thought of the blankets, axes, and knives here.'

d. *Iro nokantake.*
'That's what I say.'

A social and interactional configuration associated with a quite different relaxing of the evidential ethic involves reporting on mundane activities (typically subsistence activities) of very close social intimates, especially spouses, and to a lesser degree, parents and children living in the same household. In the vast majority of cases in which individuals in these types of intimate relationships report on the actions of their spouses, parents or children, the typical evidential ethic obtains, but in a minority of cases, speakers employ the inferential evidential clitic =*ka*.[10] This is the case in (24), where a man asks his daughter about his wife's whereabouts.

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10. Interestingly, I found that in many cases when I subsequently probed for the evidential basis of the assertion about the other person's activities, the speaker was actually in a position to report speech that would have supported their claim.

(24)   a.   Hoshi: *Tya ohatake piniro?*
                        'Where did your mother go?'

        b.   Marota: *Ohatakeka onkigera.*
                        'She presumably went to dig (i.e. harvest manioc).'

The two types of interactional configurations are both ones in which we might expect speakers to be more willing to infringe on another person's autonomy by relaxing their adherence to the evidential ethic – in one case because it involves socially more powerful individuals exerting social power in the context of inter-personal conflict, and in the other because social intimates can be understood as having a greater right to speak for each other than non-intimates do. In slightly different terms, both of these interactional configurations are ones in which normal considerations regarding negative face threats fail to hold. These observations suggest that the evidential ethic represents, in significant measure, a communicative stance that seeks to respect others' autonomy and negative face.

Evidence in favour of this conclusion can be drawn from contexts in which the use of reported speech constructions is strikingly high in comparison to normal use of these resources. These include interactions in which an individual is talking about the actions of a high-status third party in their presence; and ones in which an individual is reporting on an event or state of affairs that is significantly removed from their own recognized sphere of expertise or responsibility, such as women repeating men's hunting stories. In such cases, it is common for almost every clause to bear a quotative; in contrast, in typical speech reports it is common for several sentences to pass between explicit uses of the quotative. The result, in the cases we are considering, is an extremely elaborated attribution of actions, involvement, or knowledge to a third party that makes it clear that the reported state of affairs or knowledge pertains to the *territory of information* (Kamio, 1994) of the quoted party. Nantis' intensified use of quotatives in this context thus appears reminiscent of politeness or respect strategies which are based on pragmatic metaphors of social distance (Silverstein, 2003).

We now consider an example of this type in which Bikotoro reports some recently-acquired information from Pebero, a Nanti visitor to Montetoni, about Pebero's brother, whom none of the Montetoni Nantis had seen since they migrated to the Camisea River basin in the mid-1980s. The information thus lies solidly in Pebero's *territory of information*, and we see that Bikotoro's use of quotatives is very dense as he relates this information.

(25)   a.   Lev: *Ainyo maika?*
                        'Is he there now?'

        b.   Bikotoro: *Chapi noke ikanti ainyo irirenti.*
                        'Yesterday I heard he said, "His brother is (there)."'

c.		*Ika ainyo.*
		'He said, "He is (there)."'
d.		*Hee, chapi ikanti ainyo.*
		'Yes, he said, "He is (there)."'
e.		*Ikanti irirenti inehaati.*
		'He said, "He went to see his brother."'
f.	Lev:	*Arisano?*
		'Really?'
g.	Bikotoro:	*Ika ainyo.*
		'He said, "he is (there)."'
h.	Lev:	*Ihatuti?*
		'He went and returned?'
i.	Bikotoro:	*Ika nohatuti, karankika karanki.*
		'He said, "I went and returned, a while ago."'
j.		*Ika nohati.*
		'He said, "I went."'
k.		*Ika chapi nonehage ainyo aka.*
		'He said, "Yesterday I went to see, and he is there."'
l.		*Ika ainyo.*
		'He said, "He is (there)."'
m.		*Hee, chapi, irota ikanti ainyo aka.*
		'Yes, yesterday, as I was saying, he said, "He is there."'

Although most of the communicative practices I have described here do not rise to the level of explicitly formulated social principles or ideologies regarding social and communicative conduct, it is worth noting that there is one form of explicit meta-discourse in the Nanti communities regarding talk that is deemed to contravene the principles of proper communicative conduct described above; that is, talk that is characterized as *parikoti*.[11] Construing utterances as *parikoti* – what we might call 'loose talk' – is to assert that they rest on evidentially unsourced attributions of actions, speech, or internal states to others, thereby constituting a breakdown of proper relations of respect between individuals. Significantly, speaking *parikoti* is quite distinct from lying (*tsoheg* 'lie'), and while a speaker may also

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11. The adverb *parikoti* indicates that the state of affairs that it modifies is outside of the typical, expected, or desired space for that state of affairs. Thus, if a piece of manioc falls outside of a pot, as manioc roots are being chunked for cooking, instead of inside the pot, it is said to have fallen *parikoti*. Likewise, someone who has gone somewhere, or lives somewhere, completely outside of the realm of experience of their interlocutors can appropriately speak of going or living *parikoti*.

criticize *parikoti* speech as factually inaccurate, inaccuracy is not the defining feature of *parikoti* speech.

The strip of talk in (26) includes an evaluation of talk as *parikoti*. This strip is drawn from a longer conversation on a two-way communications radio between Migero and the leader of another community about the events surrounding a visit by a young Nanti man from the community of Marankehari, Erobakin, to the community of Migero's interlocutor. Erobakin's presence in the latter community led to some social discord, which led the leader of that community to contact the leader of Marankehari by radio and criticize him for allowing Erobakin to visit his community. The leader of Marankehari disavowed knowledge of Erobakin's visit and speculated that Migero must have approved the visit, since Erobakin's route would have taken him by Montetoni, where Migero lives. In defending himself, Migero both denies that he gave Erobakin permission and criticizes the residents of Marankehari for their evidentially unsources speculation, i.e. their *parikoti* talk.

(26)   a.   Migero: *Maika nonihake; pinkemake nonihake.*
                          'Now I am going to speak; please listen to what I say.'

   b.   *Pinkamantahirira kara pinkante maika ikantake te maika nompahigakerime peremisa.*
        'Please tell them there, say now, he (i.e. Migero) says, I did not give him permission (to visit your community).'

   c.   *Chichata ihatake kara, ihatashitake biroku.*
        'He (i.e. Erobakin) went there of his own will, he went to your place (i.e. community) of his own volition.'

   d.   *Yoga maika Marankehariku ikanti … yogabisahigakeri.*
        'Those (people) in Marankehari say … they (i.e. the residents of Montetoni) let him (i.e. Erobakin) go by (i.e. failed to stop him).'

   e.   *Hame yoka ikanti … onti hanta parikoti inihake.*
        'They should not say (that) … they are speaking parikoti there (i.e. in Marankehari).'

Assessment of talk as *parikoti* is, in my experience, most often made by men about the speech of women, but not exclusively so. Nevertheless, there is an overwhelming tendency for criticism of speech as *parikoti* to flow in the direction of social asymmetries: from men to women, from more socially prominent men to less socially prominent men, and from mature adults to younger adults. One could say, then, that *parikoti* talk is speech that contravenes the evidential ethic of Nanti discourse, but is not justified either by intimacy or appropriate social asymmetry, as discussed above.

In this section I have argued that Nanti communicative habitus embodies a practical understanding that respectful communicative conduct towards others is grounded in not infringing on others' autonomy, which crucially relies on not imputing actions or internal states to them without an explicit evidential basis. This understanding of respectful communicative conduct underlies the *evidential ethic* characteristic of Nanti communicative practice, and is one of the major factors responsible for the high frequency of reported speech in Nanti discourse.

5.   A practice-based account of the grammaticalization of Nanti quotatives and reportives

I now turn to an account relating the aspects of the Nanti communicative habitus described in the previous section to the grammaticalization of Nanti quotative evidentials. Before doing so, however, it is important to note that, in the general case, it is not plausible to equate the social and cultural factors that influence the present-day distribution and frequency of grammatical morphemes in a language with those that governed the distribution of the elements from which those morphemes grammaticalized. In other words, it is not plausible to simply project modern communicative habitus into the past. It seems unlikely, for example, that the social and cultural factors that govern the use of T/V deference indexicals in European languages in the early 21st century are the same as those that influenced their development between the 12th and 14th centuries (Brown & Gilman, 1960, p. 255). In this light, it is crucial for the account that I develop in this section to recognize that Nanti quotative evidentials appear to have grammaticalized in Nanti from inflected verbs quite recently, as I argued in Section 3. The recent grammaticalization of Nanti quotative evidentials means that it is likely that the social and cultural factors responsible for the high frequency of reported speech constructions in present-day Nanti discourse do not differ greatly from those responsible for their high frequency in the initial stages of their grammaticalization.

If this assertion is correct, the following culture-driven grammaticalization account emerges for the development of quotative evidentials in Nanti. We first assume that prior to the split between the ancestral groups that became the modern Manu Matsigenkas and the Nantis, the *evidential ethic* that we find in modern Nanti society was not a particularly salient aspect of communicative habitus in that ancestral group. Indirect evidence that this first assumption is correct comes from the extensive body of ethnographic research on modern Matsigenka society (Baer, 1984; Johnson, 2003). In the first place, there are no mentions in the Matsigenka ethnographic literature of anything resembling the *evidential ethic* that I describe for modern Nanti society. Secondly, speculation about others' internal states (e.g.

attributing desire and envy to others) appears to be central to witchcraft accusations in Matsigenka society (Izquierdo & Johnson, 2007).[12,13] Likewise, in my personal experience, I have found Matsigenkas perfectly willing to talk about others' actions and internal states in a manner strikingly different from that of the Nantis I know.[14,15]

We then assume that at some point following the split between the ancestral groups, which subsequently became the Manu Matsigenka and the Nantis, Nanti communicative habitus changed such that Nanti communicative practices came to restrict the respectful ways of talking about the actions and internal states of others to those involving reporting their speech or witnessed actions, as described in Section 4. This change in Nanti communicative habitus resulted in a significant increase in frequency of reported speech constructions, which involved inflected forms of the verb *kant* 'say' (although with a slight shift in the pragmatics of the construction). This increase in frequency then led to the grammaticalization of the Nanti verbs of saying into the set of quotative evidentials described in Section 3, which are still transparently related to the verbs from which they grammaticalized.

It must be acknowledged that this account does not address the *social actuation* question, namely, *why* did Nanti attitudes about respectful communicative conduct change? I doubt that it will ever be possible to answer this question with certainty, but I suggest that the practical Nanti concern with respectful communicative conduct forms a piece with broader, explicitly articulated social ideologies

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12.   Izquierdo & Johnson (2007) argue that there has been a sharp rise in witchcraft accusations in recent decades as a result of social strife and cultural changes resulting from colonization and modernization in most Matsigenka areas. This may very well be the case, but it should be noted that belief in witchcraft is also documented among Matsigenkas in the 19th and early 20th century (e.g. Eberhardt, 1910; Ferrerro, 1866, pp. 356–360), and among neighbouring Kampan peoples (Santos-Granero, 2004), suggesting that belief in witchcraft is not a modern innovation among the Matsigenkas.

13.   It is worth noting in this regard that Nantis did not have any beliefs regarding witchcraft prior to their encounters with Matsigenkas in the early 1990s, and I have been witness to a number of interactions in which Nantis reacted to Matsigenka ideas about witchcraft with incredulity and mirth, apparently finding the notion of witchcraft difficult to believe.

14.   Although I have not carried out intensive ethnographic work in Matsigenka communities, I have made numerous visits to several of the Matsigenka communities nearest to the Nanti communities between 1993 and 2010, and also worked closely with several Matsigenka linguistic consultants over a three-month period in 2010.

15.   It is also worth noting that Johnson (2003, pp. 91, 101, 226) emphasizes the importance of autonomy and individualism in Matsigenka society (which also holds for Nanti society), which likely reflects the shared historical origin and basis for the Nanti communicative practices with which we are concerned here.

that are highly critical of social discord, conflict, and violence. It is evident from public discourses surrounding manioc beer feasts, for example, that Nantis are often anxious about the possibility of ill will or violence emerging in those social settings, and it is not unusual for socially prominent individuals to intercede in escalating social interactions to ameliorate any conflict. Likewise, the term *matsigenka*, which at one level can be simply glossed as 'person' (in both Nanti and Matsigenka), can also be understood in common Nanti usage as 'moral person', and individuals who are guilty of displays of anger and rare instances of physical violence are typically chastised as not behaving like a *matsigenka*. Even more radically, murderers are talked about by Nantis as considering other people to be game animals, with murderers being identified with cannibals.[16] In short, there are explicit discourses that strongly critique anger, disputation, and violence in the Nanti communities, which clearly reflect a concern with, and active preventative monitoring of, these social ills. If I am correct in identifying the Nanti concern with respectful communicative conduct as part of a wider set of practices aimed at maintaining peaceful social relations, it is plausible that the changes in Nanti communicative practice we are concerned with here emerged as part of a broader shift in Nanti society that not only rejects violence but also works to head off its emotional and interactional antecedents.

6.   Discussion and conclusion

The culture-driven grammaticalization account for the development of Nanti quotative evidentials presented in this chapter relates the emergence of an evidential category to norms of respectful communicative conduct embodied in Nanti communicative habitus. In particular, I have argued that Nantis demonstrate respect for others by avoiding speculation about others' actions and their internal states. The result is an *evidential ethic* that restricts discussions of others' actions to those that the speaker has witnessed themselves, or via reported speech, actions which were reported to them by witnesses. Likewise Nantis' discussion of others' internal states are largely restricted to quoting speech that reports on those internal states – generally reports by those experiencing those states – or reporting on actions that index those states.

These observations suggest that evidentials, and quotative evidentials in particular, are likely to arise in societies in which communicative practices are

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16.   The most recent incident of which I am aware, in which one Nanti murdered another, dates to the 1960s (Michael, 2008, pp. 23–24).

informed by attitudes towards respectful communicative conduct similar to those found in Nanti society. Data relevant for evaluating this claim – and especially, the relevant information about communicative practices in particular societies – is scarce, but there are cases of correlations between communicative practice and grammatical structure similar to the Nanti case to be found in the literature.

Perhaps the most striking parallel to Nanti communicative practices and evidentials is de Reuse's (2003, pp. 95–96) discussion of evidentials in Western Apache. De Reuse suggests that the high frequency grammaticalized, but non-obligatory, evidentials in Western Apache stem from "[…] Athabaskan attitudes about the autonomy of the person […] resulting in a reluctance to speak for another person, or to impute feelings to another person." Like Nanti, Western Apache exhibits a quotative grammaticalized from an inflected verb of speaking.

We find an Amazonian parallel to Nanti in Basso's (1995, pp. 295–296) discussion of the remarkably high frequency of reported speech in Kalapalo (Carib, Brazil) narratives, which she attributes to the fact that "in all Kalapalo stories […] the emotions and motives of the speakers […] are realized through their quoted speech, rather than through labels or a narrator's more direct description of feelings and motives." Likewise Basso remarks that "[a] character's subjective version of reality emerges from an interactive, interpersonal field of interpretation, planning, and formulation of goals […] Such interpretations are constituted as speech-centred events […] rather than, for example, 'thought' […]." As in Nanti interaction, then, Kalapalo narrators do not generally attribute internal states to others, and although Basso does not report a grammaticalized quotative per se for the language, she does describe a large set of evidential, epistemic modal, and intersubjective markers (Basso, 2008), supporting the proposed relationship between communicative practices that avoid reference to others' internal states and the grammaticalization of evidentials.

These cases in the Americas suggest that it may be fruitful to cast a broader net that examines the relationship between evidentiality and communicative practices informed by opacity of mind *doctrines* (Robbins & Rumsey, 2008). Described for a number of societies in New Guinea and Oceania, opacity of mind doctrines are explicit articulations that others' internal states are, to varying degrees, unknowable. Stasch's (2011) description of Korowai (Trans-New Guinea, Irian Jaya) understanding of opacity of mind, for example, as a "moral emphasis on respecting others' mental autonomy" is reminiscent of my characterization of Nanti communicative practice. Schieffelin's (2008) description of Kaluli (Trans-New Guinea, Papua New Guinea) communicative practices indicates that similar principles are at play in Kaluli society, and we also find that Kaluli exhibits an elaborate evidential system (Schieffelin, 1996).

A handful of comparative cases exemplifying an association between grammaticalized evidentials and communicative practices informed by a dispreference for attributing internal states to others is merely suggestive, of course. Nevertheless, they are consistent with the CDG account of Nanti quotatives and indicate a possibly fruitful direction for future comparative research.

It is important to point out, in this light, that there is no reason to believe that all evidentials, or even all evidential systems, arise for the same reasons. Aikhenvald (2004, p. 358) and Fortescue (2003, p. 301), for example, suggest that the emergence of evidentials may be related to culture-specific understandings about the assignment of responsibility for communicative activity or events in the world. In a similar vein, I have argued that one of the interactional uses of evidentials in Nanti society, especially inferentials, is to distance speakers from mishaps and other unfortunate states of affairs (Michael, 2008, pp. 115–156).

The formulation of CDG articulated in this chapter builds on the theoretical continuity between practice theory and grammaticalization theory, which together provide a common framework for discussing the conventionalization of social practices and communicative ones. From this perspective, grammaticalization constitutes a particular extreme of conventionalization and structuration, but one that is embedded in broader social practices by virtue of the mediating role of communicative practices. This formulation suggests that there is much to be gained by the integrated study of grammar, communicative interaction, and social action, and not least, a better understanding of the cultural and social basis of linguistic form.

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Grammar and society

Societies of intimates and linguistic complexity

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The uniformitarian principle that knowledge of processes that operated in the past can be inferred by observing ongoing processes in the present is fundamental to historical linguistics. But there is an important respect in which the present is not like the past. Increasing population and mobility have led to increasing language contact and larger language communities. For ninety-seven percent of their history, human languages were spoken in neolithic and pre-neolithic societies which were societies of intimates, characterized by small size and dense social networks. A sociolinguistic-typological perspective suggests that the languages spoken in these communities may therefore have been typologically rather different from most modern languages, and that the methodology of 'using the present to explain the past' might therefore be less useful the further back in time we go.

1. Introduction

One of the fundamental bases of modern historical linguistics has been the *uniformitarian principle* Labov (1994). This principle was initially developed by geologists, but its relevance to linguistics has long been recognized, and powerfully argued for by William Labov. It states that *knowledge of processes that operated in the past can be inferred by observing ongoing processes in the present*. In other words, we can suppose that language structures in the past were subject to the same constraints as language structures now in the present. For example, as Dixon (1997) has said, it is likely that the reason there are no primitive languages today is that there never have been. The principle also implies that we can suppose that the mechanisms of linguistic change that we see operating around us today are the same as those which operated even in the remote past. This leads to the methodological principle of 'using the present to explain the past': we cannot seek to explain past changes in language by resorting to explanations that would not work for modern linguistic systems.

However, there is one very important respect in which the present is not like the past at all. This has to do with the enormously rapid development of transport and communications facilities in the past 150 years – but even more importantly with demography and, as a consequence, social network structure. There are very many more of us human beings on the planet now than there have ever been: in the past 500 years the population of England has increased from about 4 million to about 50 million, for instance. Increasing populations and increasing mobility have led to more and more language and dialect contact, and larger and larger language communities, so that languages and dialects spoken in small, low-contact, isolated communities with tightly-knit social networks and large amounts of communally shared information are becoming less and less common.

Labov himself, in his discussion of the uniformitarian principle, warns that we must be "wary of extrapolating backward in time to neolithic preurban societies" (Labov, 1994, p. 23): the methodology of 'using the present to explain the past' might be less useful the further back in time we go. But his use of the word 'neolithic' is very thought-provoking. If we think about it, we realize that most of the linguistic past – nearly all of the history of human language – took place in pre-neolithic or neolithic societies. Human language may well have come into existence as long as 200,000 years ago (see Evans, 2009). The earliest date for a post-neolithic society anywhere in the world is about 5,000 years ago, in the Middle East (Langer, 1987), and later, sometimes very much later, everywhere else. This would mean that human languages were spoken in neolithic and pre-neolithic societies for at least 97% of their history.

Until the domestication of plants and animals, our ancestors were all hunter-gatherers. As such, they belonged to *societies of intimates* – that is, societies "where all *generic* information is shared" (Givón, 1979, p. 297). As described by Givón & Young (2002), such societies contrast with "societies of strangers" (Givón, 1979, p. 297), the larger and more complex human groups which began to develop around 10,000 BC and which most of us inhabit today (Givón, 1979, p. 287; 1984, p. 249). For nearly all of human history, humanity in its entirety lived in societies characterized, according to Givón and Young, by stability, small size (no more than 150 people), restricted territorial distribution (with a radius of no more than 20 miles), cultural uniformity, and *informational homogeneity*. And these were also societies with dense social networks.

It is therefore probable that widespread adult-only language contact is a mainly post-Neolithic and indeed a mainly modern phenomenon, associated with the last 2,000 years. Nichols (2007, p. 176) agrees that language contact "may well have been rare in prehistory, though it is responsible for much reduction in morphology in Europe over the last two millennia." Given that the development of large, fluid communities is also a post-neolithic and indeed mainly modern

phenomenon, then a sociolinguistic-typological perspective suggests that the dominant standard modern languages in the world today are likely to be seriously atypical of how languages have been for nearly all of human history, a point with which Wray & Grace (2007) concur.

This poses an interesting problem for linguistic typology. A great deal of attention has been paid by researchers in this field to the sampling of the world's languages for typological purposes. It is acknowledged that it is important in constructing samples to avoid *areal* bias, so that languages in one part of the world are not favoured at the expense of languages elsewhere; and that it is also vital to avoid *genetic* bias, so that certain language families are not overrepresented (Dryer, 1989; Song, 2001, sec. 1.5.3–1.5.4). What is suggested by the perspective I am presenting here, however, is that there is also a problem of *chronological* bias. This problem is insuperable. There is obviously no way we can make a genuine sample of all the languages that have ever existed; and if modern languages are not, as a whole and on average, typical of how languages have been for most of human existence, then a representative modern sample will not in fact be representative. It could be argued that this puts seriously into question the value of language sampling in linguistic typology. Dixon (2010a, p. 257ff) argues against sampling in linguistic typology, not least because many of the materials currently being sampled are taken from inadequate descriptions, and because, as he argues, we should rather be devoting our efforts to improving and expanding these descriptions. But even if, in the fullness of time, that defect could be remedied, there is no likelihood that the problem of chronological bias will ever be overcome.

The long-term diminution in the number of communities which are *societies of intimates* suggests that linguists should also consider which aspects of linguistic structure are most likely to be associated with such societies, and therefore also likely to be in danger of being lost to the world, and to linguistic science.

One example may lie in Blust's account of bizarre sound changes in Austronesian languages, which includes a suggestion that "speakers may sometimes engage in a conscious, arbitrary manipulations of linguistic symbols" (Blust, 2005, p. 264) – in other words, the only way he can think of for explaining certain phonological changes is to suppose that speakers produced these sound changes deliberately – consciously and on purpose. For example, Proto-Manus had a prenasalized voiced alveolar trill /ⁿdr/. In Drehet, one of the languages spoken on the Admiralty Island of Manus in Papua New Guinea, this consonant has – extraordinarily – become an aspirated voiceless velar plosive /kʰ/ (Blust, 2005, p. 226).

For those of us who feel doubtful about speakers deliberately indulging in linguistic change, Blust refers us to Laycock (1982), who describes a situation in the Uisai dialect of Buin, a Papuan language of Bougainville Island, where all masculines have become feminine and all feminines have become masculine. Laycock

argues that, since "there is no accepted mechanism for linguistic change which can cause a flip-flop of this kind and magnitude", he believes that "at some stage in the past, some influential speaker of the Uisai dialect announced that from now on his people were not to speak like the rest of the Buin. Once the change was adopted, it would become the natural speech of the community within one or two generations" (Laycock, 1982, p. 36). Whether or not this is true, it is certainly not the kind of development that is likely to succeed in anything other than a small, tightly-knit society of intimates.

2.   Cross-linguistically dispensable categories: Dual (plus) number

Other, more typical linguistic features which are likely to be lost as societies of intimates disappear are those morphological categories which are most obviously, as Dahl (2004) says, *cross-linguistically dispensable*. For example, nearly all European languages have lost the dual number in the last 2000 years or so. Some, like English, lost it long ago. Others, like Polish, lost it much more recently. Yet others still retain it.

One striking thing about this development is that this loss of *verbosity* – the usage of features which are cross-linguistically dispensable (Dahl, 2004) – has gone hand in hand with demographic expansion. This is unlikely to be just a coincidence; it is noticeable that those European languages which have retained the dual number are spoken by relatively small numbers of speakers, by European standards, such as Slovenian (2.5 million or so), or by very small numbers of speakers, such as Sami. According to Haugen (1976, p. 303), "Tylden (1956) speculates on the gradual disappearance of the dual in Indo-European as evidence of social change from a 'primitive' face-to-face society to one of greater mobility".

Some suggestive work which gives us some insight into why this might be so has been carried out by (Perkins, 1980, 1992). Perkins takes as the starting point for his research a suggestion by Keenan (1976) that deictic systems are better developed in non-literate communities with fewer than 4000 speakers than in larger communities. Kay (1976), for instance, says that

> in small, homogeneous speech communities there is a maximum of shared background between speakers, which is the stuff on which deixis depends. As society evolves toward complexity and the speech community becomes less homogeneous, speakers share less background information, and so one would need to build more of the message into what was actually said.   (Kay, 1976, p. 18)

Givón (1979), too, observes that people in more complex cultures are more frequently required to interact with other people who they do not know.

Linguists are naturally sceptical about relating linguistic and cultural complexity. Bickerton (1996, p. 35) says that "if there were any link between cultural complexity and linguistic complexity, we would expect to find that the most complex societies had the most complex languages while simpler societies had simpler languages […] We do not find any such thing." Interestingly, indeed, we now have data which can be interpreted as suggesting that the relationship is the other way round: I have been arguing that certain aspects of linguistic complexity seem to be more evident in simpler than in complex societies (see Trudgill, 2011).

The argument of Perkins (1980, 1992) is that deictics identify referents by connecting them to the spatial-temporal axis of speech events. Deictics in his terms include persons, tenses, demonstratives, directionals (*here*, *there*), inclusive vs exclusive, etc. The point about deictics, he argues, is that they involve the requirement that the spatio-temporal context of their use be available for the interpretation of the intended referents.

Perkins conjectures that deictics will be more salient in less complex than in more complex cultures. He then goes on to say that they are therefore more likely to appear in the central inflectional systems of the languages concerned than more peripherally in the lexis or periphrastically. This is in turn because the more frequently free deictic morphemes occur, the more likely they are to be subject to grammaticalization processes which turn them into bound morphemes through coalescence and morphologization.

Perkins investigated 50 languages and their usage of seven deictic affixes: tense, person on verb, person on nouns, spatial demonstratives on verbs, spatial demonstratives on nouns, inclusive vs exclusive on person markers, and dual in person markers. Communities are ranged for cultural complexity from 1 (e.g. Andamanese) to 5 (e.g. Vietnamese). The measurement of cultural complexity that Perkins uses is based on the work of anthropologists such as Carneiro (1973), and computed in terms of factors such as type of agriculture, settlement size in terms of population, craft specialization, and numbers of levels in political and social hierarchies.

Perkins shows statistically that there is an inverse correlation between social complexity and the presence of deictic affixes. For example, languages associated with the most complex cultures – those scoring 5 – have on average 1.22 deictic affixes, while those scoring 1, the lowest, have on average 3.28. He concludes that deictic affixes are lost as cultures become complex.

Most linguists are likely to feel a little uncomfortable about the notion of cultural complexity. I therefore propose to leave this issue to the anthropologists, at least for the time-being, and would argue that we probably do not need to look any further, for our own linguistic purposes, than actual community size and shared information. What is probably crucial here is simply how many individuals are

involved in a particular speech community, and how much shared information is available – in other words, to what extent they meet the profile of a society of intimates. In any case, an increasing loss of the category of dual (trial, etc.) number from the world's languages in the future would not be a surprise.

3.   Cross-linguistically dispensable categories: Large pronominal systems

Personal pronominal systems (see Dixon, 2010b, p. 189ff) also seem to be related to societal type in a very similar way. Some languages have highly elaborated pronominal systems whose elaboration is not motivated by the presence of a social hierarchy or politeness factors that have led to the pronominal complexity that we find, for instance, in Korean and Thai. Aikhenvald & Dixon (1998, p. 254) suggest that there is a strong possibility that there can be a role for social factors in personal pronoun development, when they point out that the most complex pronominal systems in the world's languages "tend to be found in small-scale language communities with a classificatory kinship system" (see also Dixon, 1997, p. 117). There does indeed appear to be a very good prima facie case for investigating this possibility. In particular, the presence of dual, trial or higher number systems in small-scale language communities, in combination with the exclusive-inclusive distinction mentioned by Perkins, can produce very large systems indeed.

To give just a few examples, the small-group indigenous languages of Australia typically have at least 11 personal pronouns, involving 1st, 2nd and 3rd persons; singular, dual and plural numbers; and inclusive and exclusive 'we'. For instance, Nyamal (Dench, 1994, p. 170) has the following distinctions.

Table 1. The pronominal system of Nyamal

	singular	dual	plural
1.INCL	ngatja	ngalilu	nganjtjula
1.EXCL		ngaliya	nganartu
2	njunta	njumpalu	njurralu
3	palura	piyalu	thanalu

Fijian has an even larger system because of the addition of trial number. Dixon (1988, p. 54) give the system in Table 2 for Boumaa Fijian.

The trial number in Boumaa Fijian is probably best described as paucal, since it can also be used to refer to 'a few'. Interestingly in view of our sociolinguistic-typological observations, Geraghty (1983) shows that a number of modern varieties of

Table 2. The pronominal system of Boumaa

	singular	dual	trial	plural
1.INCL	*yau*	*'eirau*	*'eitou*	*'eimami*
1.EXCL	–	*'eetaru*	*'etatou*	*'eta*
2	*i'o*	*'emudrau*	*'emudou*	*'emunuu*
3	*'ea*	*(i)rau*	*(i)ratou*	*(i)ra*

Fijian have lost or are losing the distinction between trial and plural, with the trial form being the one to survive.

In terms of size of systems, moreover, this is by no means the end of the story. Hutchisson (1986, p. 5) shows that Sursurunga has a 5-way number system: singular, dual, trial, quadral and plural. As a result, it has nineteen 'persons'. Sursurunga is an Austronesian language of Papua New Guinea with about 3,000 speakers.

Table 3. The pronominal system in Sursurunga

	singular	dual	trial	quadral	plural
1.INCL	*iau*	*giur*	*gimtul*	*gimhat*	*gim*
1.EXCL		*gitar*	*gittul*	*githat*	*git*
2	*iáu*	*gaur*	*gamtul*	*gamhat*	*gam*
3	*-i/on/ái*	*diar*	*ditul*	*dihat*	*di'wuna*

If the possibility of pronominal gender is now added to the equation, we encounter truly complex pronominal systems. Siewierska (2004, p. 111) claims that the fullest pronoun paradigm that she has ever seen is that of !Ora. It has 31 pronouns (Güldemann, 2001). !Ora is a Khoekhoe language of southern African nomads which *Ethnologue* showed to have 50 speakers in 1977 (Grimes, 2000) and which is now extinct. This 31-pronoun system distinguishes between male and female in the first and second as well as third persons, has dual number, and contrasts exclusive and inclusive 'we'. An overview is given in Table 4 (C stands for 'common gender').

This contrasts dramatically with, say, the simple 8-pronoun system of French in Table 5 or the 7-pronoun system of Standard English in Table 6.

It contrasts especially with the genderless 6-pronoun system of Cantonese (60 million native speakers), presented in Table 7.

The !Ora 31-pronoun system tallies well with Perkins' hypothesis about deixis and small communities. And I suggest that the development anew of such a

Table 4. The pronominal system in !Ora

	singular	dual	plural
1.INCL.C		sam	sada
1.INCL.F		sasam	sase
1.INCL.M		sakham	satje
1.EXCL.C		sim	csida
1.EXCL.F	tita	sisam	sise
1.EXCL.M	tire	sikham	sitje
2.C		sakhaoo	sadu
2.F	sas	sasaro	sasao
2.M	sats	sakharo	sakao
3.C	ll'ãi'i	ll'ãikha	ll'ãine
3.F	ll'ãis	ll'ãisara	ll'ãide
3.M	ll'ãib	ll'ãikhara	ll'ãiku

Table 5. The pronominal system in French

	singular	plural
1	je	nous
2	tu	vous
3.M	il	ils
3.F	elle	elles

Table 6. The pronominal system in Standard English

	singular	plural
1	I	we
2		you
3.M	he	
3.F	she	they
3.N	it	

Table 7. The pronominal system in Cantonese

	singular	plural
1	ngóh	ngóhdeih
2	léih	léihdeih
3	keúih	keúihdeih

pronominal system in any of the languages of the modern world is now unlikely –
and of course, tragically, the !Ora system has now already been lost.

4. Cross-linguistically dispensable categories:
Generationally-marked pronouns

Another very clear example of a linguistic phenomenon that could only have
developed in a society of intimates comes from the work of Tadmor (this volume).
    According to Tadmor, Onya Darat distinguishes between singular, dual and
plural in its personal pronominal system, and it also has an exclusive vs. inclusive
distinction in the 1st-person dual and plural. Remarkably, however, Tadmor shows
that the system also incorporates another highly unusual grammatical distinction:
generational affiliation. The singular pronouns indicate the generational affiliation
of the referent(s) vis-à-vis the speaker(s) or the interlocutor(s), with the two-way
distinction of forms being between those for members of the same or a younger
generation, on the one hand, and those for members of an older generation, on the
other. The dual and plural pronouns work differently in that they indicate the gen-
erational relationship between the referents, with the distinction of forms being
between those for members of the same generation, and those for members of dif-
ferent generations – except that the first person dual and plural inclusive pronouns
are not marked for generation in this way. This gives a total of twenty pronouns.
    For example, the third person forms are as follows:

Table 8. Onya Darat third person pronouns

singular ≤	*iyo*
singular >	*idoh*
dual =	*doduh*
dual ≠	*damaaq*
plural =	*diyen*
plural ≠	*denaq*

    Clearly, such a system can only work in a society where everybody knows
everybody else: generation does not necessarily match with age – one's nephew
might well be older than oneself. A speaker actually has to know the generational
affiliation of everyone in the community in order to be able to use the correct
pronoun. This worked well in traditional Onya Darat society because each village
consisted of a single longhouse, with a newly established village consisting perhaps
of as few as six families, an older village of maybe sixty. Crucially, the longhouses
were "inhabited by people who were related to each other by blood or marriage.

They knew each other intimately, which enabled them to keep track of the exact generational relations between all members of the community" (Tadmor, this volume, p. 95).

Sadly, extensive destructive logging of the forest habitats of the Onya Darat has now more or less destroyed this traditional way of life; the longhouses are disappearing – and this perhaps unique society-of-intimates pronoun system with them.

5.   Cross-linguistically dispensable categories: Evidentials

Thirdly, in languages with evidential systems there is a grammatical requirement that the source of the speaker's information should be morphologically marked, rather as all finite verbs in English must be marked for tense. As described by Aikhenvald (2003, pp. 287–323), the system in Tariana is very highly developed. Its morphological markers are fused with tense suffixes. In the recent-past tense (Aikhenvald, 2004) for example, the five evidential verb suffixes are:

VISUAL: *-ka*
NONVISUAL: *-mahka*
INFERRED: *-nihka*
ASSUMED: *-sika*
REPORTED: *-pidaka*

According to Aikhenvald (2003, p. 294), VISUAL evidentials refer to events which have been seen by the speaker; the NON-VISUAL forms to events heard or otherwise sensed non-visually; the INFERRED category relates to "information obtained through observing direct evidence of an event or state"; the ASSUMED category to "information obtained by reasoning or common sense through observing evidence of an event or state without directly experiencing it"; and REPORTED refers to second-hand or third-hand information, as in *The dog bit him* [someone told me] (the same effect can be achieved in English by using the adverb *apparently*).

Aikhenvald (2004, p. 2) gives an extended example of how this works, based on the five different Tariana translations of the English sentence *José has played football*. The equivalent in Tariana cannot be uttered without an evidential marker – this would be ungrammatical. The form *irida* means 'football', *di* is the 3rd-person singular marker, and *manika* is the verb 'to play':

(1)   a.   *Juse irida di-manika-ka*
            'José has played football' [we saw it]

      b.   *Juse irida di-manika-mahka*
            'José has played football' [we heard it]

c.   *Juse irida di-manika-nihka*
     'José has played football' [we infer it from visual evidence]

d.   *Juse irida di-manika-sika*
     'José has played football' [we assume this on the basis of what we already know]

e.   *Juse irida di-manika-pidaka*
     'José has played football' [we were told]

As Aikhenvald explains, the INFERRED marker can be used "if one sees the football is not in its usual place in the house, and José and his football boots are gone (and his sandals are left behind), with crowds coming back from the football ground". The ASSUMED marker would be used if José is not at home on a Sunday afternoon and "we know that he usually plays football on a Sunday afternoon".

The sociolinguistic-typological question here is: why do some languages have evidentials and others not? – a question also asked by Aikhenvald (2004, p. 355). For example, can we provide an answer by saying that evidential systems are necessarily mature phenomena, dependent for their genesis on long periods of social stability and low adult-only contact?

Although much about the origins of evidential markers remains unknown, Aikhenvald (2004) outlines a large number of different origins. She shows that where evidential markers are spontaneously generated rather than borrowed, their diachronic origin may be grammaticalized verbs (such as verbs of saying and seeing); spatial deictics; demonstratives; pronouns; locatives; participles; and copulas, to name only some of the sources. For example, the VISUAL marker *-ka* in Tariana may derive from the verb form *nu-ka* 'I see'; and the NON-VISUAL marker *-mha* derives from the verb *hima* 'to hear, feel' (Aikhenvald, 2004, pp. 273, 286). This means that evidentials are clearly the result of a process of grammaticalization. Dahl also believes that they have a non-trivial prehistory: evidential systems "are clear examples of maturation (or grammaticalization) processes leading to an increase in system complexity" (Dahl, 2004, p. 189).

A reason for this increase in complexity might be that evidential systems are typical products of societies of intimates. Aikhenvald (p.c.) has indicated an answer to why some languages have evidentials and others do not, by pointing out that large complex systems of evidentiality (with four, five or six specifications) are found only in small communities. Earlier, Dixon (1997, p. 120) had said that "detailed systems of evidentiality tend to be found only among non-industrialized people". Aikhenvald suggests that the explanation may lie in the fact that in such communities there is pressure for everybody to be fully explicit about their source of information. Aikhenvald confirms that "complex evidential systems, in their vast majority, are confined to languages with smallish numbers of speakers, spoken in small, traditional societies" (Aikhenvald, 2004, p. 355).

She cites three languages from the Vaupès area of northwestern Amazonia with 5-way systems: Tariana, the Arawakan language mentioned above, currently has about 100 speakers (Aikhenvald, 2003); Tuyuca, an East Tucanoan language, has about 800 speakers; and Hupda or Hup, a Maku language, has about 1,500 speakers (Epps, 2008). Another language from northern California, Wintu, a Wintun language, has only a handful of speakers (Mithun, 1999).

Aikhenvald also cites two languages with a six-way evidential contrast. They are both from the Southern Highlands of Papua New Guinea: Foe, which has about 2,780 speakers, and Fasu, with 1,200. Both are members of the Kutubuan family, but not closely related. Finally, she lists two Pomoan languages from northern California which probably have seven contrasts: Kashaya and Central Pomo, which are listed in *Ethnologue* with 45 and 4 speakers respectively.

Aikhenvald (2004, p. 359) then provides an explanatory insight reminiscent of the arguments of Perkins above:

> Being specific in one's information source appears to correlate with the size of a community. In a small community everyone keeps an eye on everyone else, and the more precise one is in indicating how information was acquired, the less the danger of gossip, accusation, and so on. No wonder that most languages with highly complex evidential systems are spoken by small communities.

She also wonders, cautiously, if there are cultural correlates of large evidential systems. She supposes that some language communities may have sets of beliefs, mental attitudes, behavioural conventions and discourse conventions "which are compatible with the independent development of evidential systems with their requirement to be as precise and as specific as possible about information source" (Aikhenvald, 2004, p. 359). In an interesting passage which suggests that the same kind of cultural motivation for evidential-system development is unlikely these days to be found in larger, more fluid communities, Aikhenvald also writes (Aikhenvald, 2004, p. 358):

> In the context of Amazonian societies, the requirement to be precise in one's information source may be related to the common belief that there is an explicit cause – most often sorcery – for everything that happens. So as not to be blamed for something that in fact they had no responsibility for, a speaker is careful always to be as explicit as possible about what they have done.

It may, then, not be a coincidence that, as Aikhenvald & Dixon (1998) report, grammatical evidentiality has been independently innovated in at least six different sites in Amazonia.

In any case, there is good reason to believe that highly developed evidential systems may indeed be a linguistic feature particularly strongly associated with societies of intimates. If so, we can assume that they are therefore in danger of

being lost from the world's languages. Certainly, we know that the northern California Wintu evidential system (see above) was reduced from five terms to two between the 1930s and the1960s (Aikhenvald, 2004, p. 300).

6.   Conclusion

There is reason to suppose that many aspects of linguistic complexity developed in societies of intimates. According to Dixon, "the most complex grammatical systems […] are typically found in languages spoken by small tribal groups" (Dixon, 2010a, p. 7). It is therefore possible that with the gradual disappearance of societies of intimates, we will also see the disappearance of complexifying linguistic changes. There may well also be a trend towards a predominance of simplifying changes because of language contact – as Wray and Grace say: "a language that is customarily learned and used by adult non-native speakers will come under pressure to become more learnable by the adult mind, as contrasted with the child mind" (Wray & Grace, 2007, p. 557; see also Lupyan & Dale, this volume) – and thus in the long run a significant reduction in overall world-wide linguistic complexity.

In a now very dated-sounding argument, Jespersen (1894, 1922) refers to synthetic, inflexional languages as typically "ancient" and encumbered with morphological baggage. In contrast, he describes analytic languages as being streamlined and typically "modern", as if there was some inevitability about this. But maybe he was right, and maybe it is a development approaching inevitability – though not at all for the reasons that he suggested. He regarded the path from the one type to the other as representing "progress", but we can now see that, as I wrote in 1983, "it is not entirely out of the question that, although for demographic and sociolinguistic rather than straightforward linguistic reasons, our philosophical forbears were right when they pointed to a kind of evolutionary trend in linguistic change" (Trudgill, 1983, p. 107).

Bickerton (1981) has argued for the importance of the study of the development of creole languages by children in high contact situations, as a window into the nature of linguistic competence. In addition, I want to suggest, in a kind of mirror image of his argument, that if we are keen to learn more about the inherent nature of linguistic systems and their propensity to change in certain ways, we must focus our attention on linguistic changes of the type that occur in low contact varieties. Even if isolated languages do have amazing and unusual features, to those of us of a European-language background and to those of us who speak standard creoloids and koines, they are of interest precisely because they represent, to the clearest extent possible, the limits to which languages can go when, as Bailey (1982) says, they are "left alone". And they may not just be amazing and unusual

to us. Wohlgemuth (2010) suggests that "rarities" – very rarely-occurring or even unique linguistic phenomena – are more likely to be found in languages spoken by small numbers of speakers, which are therefore more likely to be endangered. This provides us with another reason for arguing that more linguistic fieldwork should be carried out more urgently before such features are lost to linguistic science forever.

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On the relation between linguistic and social factors in migrant language contact

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With a rich migration history, the Australian context has provided a fascinating and fertile landscape through which to explore the patterns of linguistic and sociolinguistic variation which arise when languages and cultures are transplanted from earlier, often bilingual, environments to a new English-dominant one. Drawing on extensive research undertaken in the Australian context, this chapter explores a range of linguistic and sociolinguistic features relevant to understanding language contact in a migrant setting, including facilitation of code-switching; pragmatic effects, such as the use of modal particles and discourse markers and address patterns; standardization and codification; pluricentric languages; diglossia and the role of language as a core value. In a number of cases it considers the relative role of and possible interaction between linguistic and social (and cultural) factors in governing language phenomena in Australia. In addition to the possible effect of the linguistic characteristics of specific migrant languages, we also look at the effect of the pre- and post-migration sociolinguistic and cultural contexts and how these might explain patterns of bilingual behaviour and language maintenance in Australia.

1. Introduction[1]

In the context of increasing global migration over many decades, Australia offers an outstanding laboratory for language contact studies. Based on the research of

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the late Professor Michael Clyne, this chapter explores what happens when languages are disassociated from the earlier, often bilingual context, and transplanted into a new English-dominant multilingual context. Drawing on previous research conducted on these issues within the Australian context, it looks at a variety of migrant languages, such as German, Dutch, Hungarian, Vietnamese, Macedonian, Somali, Arabic, Italian and Filipino. It considers what effect the pre-migration experiences, that is, the social and sociolinguistic environments and the linguistic characteristics of the migrant languages, have on bilingual behaviours and on the languages' survival in the immigrant country, Australia.

We are particularly interested in the interface of the linguistic and social (including sociolinguistic, sociocultural, and sociopolitical) factors to see what effects these elements, as well as their possible interactions, have on language contact outcomes in Australia (and potentially elsewhere). We first consider rates of language shift and language maintenance across different migrant communities in Australia to highlight the great divergence in outcomes, even amongst the small set of languages listed above, and consider briefly what factors might be at play to account for it. We then shift our focus to bilingual behaviour, and consider the impact of language contact on a small number of linguistic phenomena: (1) the facilitation of code-switching, and in the context of pragmatic interaction (2) the use of modal particles and discourse markers as well as (3) address in contact situations. As we will see, both linguistic properties of the migrant languages and sociolinguistic and cultural factors are at work, albeit to different degrees. We then turn to examining the issue of language survival in Australia by returning to the issue of language shift and maintenance in light of the sociolinguistic status of the languages in their homeland environment, which includes such factors as the impact of late or ongoing standardization and codification; pluricentricity; diglossia and the role of language as a core value. We argue that these potential features of a sociolinguistic typology can help explain the language-related behaviour of different migrant communities and the chances of survival (or otherwise) of their languages in a migrant country such as Australia.

2. The Australian context

While migration is often temporary and transitory, the general expectation for migrants to Australia has been that the transition is a permanent one. In the post-World War II context, the massive wave of migration to Australia was coupled with a widespread expectation of a disassociation from country, language, and culture of origin. Over time, changes in attitudes and policies have allowed for the development of dual and multiple cultural and linguistic identities (Clyne & Kipp, 2006).

The focus of Australia's migration policies and priorities has also changed considerably since the end of World War II. Initially, unskilled migrants from Europe arrived en masse to facilitate the development of Australia's manufacturing industry, while the arrival of Vietnamese refugees in boats in the 1970s created a shift towards a humanitarian component of migration. Although migration to Australia is a contentious and hotly debated issue, prone to *ad hoc* changes suiting political imperatives, broad categories of migration currently include humanitarian, skilled worker, business and employer-nominated programs. Consequently, not only do migrants to Australia bring along a multitude of languages and cultures, they come to Australia under vastly different circumstances, carrying with them a variety of pre-migration experiences which impact on patterns of language use and the negotiation of new and/or ongoing identities (Clyne & Kipp, 2006).

At present, there are over 230 languages spoken in Australian communities, along with hundreds of dialects. These languages encompass the full range of linguistic types and include migrant languages from all over the world, as well as the languages of Australia's original inhabitants, the Indigenous Australians. Extensive research into migrants and language use has been undertaken in the Australian context looking at the functions of language, as well as the impact of language contact in the new linguistic environment. In the Australian context, for example, research into language maintenance and shift over time has identified the differing rates of language shift amongst different migrant groups (e.g. Clyne, 2011; Clyne & Kipp, 1997). Tables 1 and 2 give an overview of the language shift rates of different migrant groups. We can see, for example, that the rate of shift to English only in the home is below five percent for migrants born in Vietnam, China, Iraq, Eritrea, Somalia, and Taiwan, but higher than fifty percent for those born in Germany, Austria, and the Netherlands (Table 1). Previous census data has allowed for the tracking of language shift among second generation migrants (e.g. Table 2), although 1996 was the last time the Australian Bureau of Statistics collected data about parents' birthplaces, and it has not been possible to estimate language shift in the second generation since that time. Some of the variables that influence rates of shift will be discussed in this chapter.

If we consider briefly the distribution of language groups in Table 1 and in particular the extreme endpoints (very low shift vs. very high shift in the first generation), a number of important observations can be made. Those groups that have been established in Australia the longest (e.g. the Dutch, Germans, Austrians, Lithuanians and Latvians), speak a language most closely cognate with English (Dutch and German), or come from a country where English is already well established (e.g. Singapore and Malta), are most likely to show shift to English. On the other hand those groups that are more recently arrived (e.g. from Asia, the Horn of Africa) and speak a language that is linguistically very distant from English and

Table 1. Language shift in the first generation, 2006 (Clyne, 2011)

Birthplace	Shift (%)	Birthplace	Shift (%)	Birthplace	Shift (%)
Viet Nam	3.0	Russian Fed	14.2	Mauritius	28.5
China	3.8	Ukraine	14.2	India	34.4
Iraq	3.9	Ethiopia	14.9	France	35.0
Eritrea	4.4	Indonesia	17.3	Malaysia	35.0
Somalia	4.5	Italy	17.3	Sri Lanka	35.0
Taiwan	4.8	Japan	17.4	Hungary	36.7
Cambodia	5.3	Argentina	18.1	Malta	39.9
Former Yugoslavia	6.5	Other South America	19.3	Latvia	42.4
El Salvador	7.0	Brazil	20.0	Lithuania	44.6
Lebanon	7.4	Portugal	20.5	Switzerland	44.9
Turkey	8.2	Egypt	22.2	Singapore	49.1
Greece	8.6	Poland	23.6	Germany	53.9
Hong Kong	11.2	Philippines	27.0	Austria	55.2
Chile	13.8	Spain	27.5	Netherlands	64.4

without a locally rooted tradition of English (again, e.g. Asia, the Horn of Africa) are least likely to shift to English. However, some other communities (e.g. those from ex-Yugoslavia including Macedonia) are resistant to shift despite long settlement in Australia, suggesting that specific social and cultural factors may be at play here, as detailed below in Section 5 with respect to Macedonian.

As shown in Table 2, the effect of shift in the first generation is replicated and often magnified – especially in exogamous situations – in the second generation in Australia. Not surprisingly, as discussed briefly below, the effect of language shift in both generations is greatest for the Dutch migrant community – for all the reasons above coupled with cultural values that support assimilation to the local environment, including the low value given to Dutch language as a core value for maintaining Dutch identity in Australia (see below and also Clyne, 2005, p. 75).

2.1   The functions of language

All languages share the same main functions of (a) communication, (b) identity, (c) cognitive and conceptual development, and (d) action (the pragmatic expression and performance of speech acts) (Clyne, 2005, pp. 31–34, 2011). Firstly, language is the most important form of human communication. It allows us to convey information, ideas and emotions. In the migrant context, an inability

Table 2. Language shift in the second generation by birthplace of parents, 1996 (Clyne & Kipp, 1997, p. 463)

Birthplace of parent(s)	Language shift (%)		
	Endogamous	Exogamous	Second generation (aggregated)
Austria	80	91.1	89.7
Chile	12.7	62.3	38
France	46.5	80.4	77.7
Germany	77.6	92	89.7
Greece	16.1	51.9	28
Hong Kong	8.7	48.7	35.7
Hungary	64.2	89.4	82.1
Italy	42.6	79.1	57.9
Japan	5.4	68.9	57.6
Korea	5.4	61.5	18
Lebanon	11.4	43.6	20.1
Macedonia, Rep. of	7.4	38.6	14.8
Malta	70	92.9	82.1
Netherlands	91.1	96.5	95
Other South America	15.7	67.1	50.5
Poland	58.4	86.9	75.7
China	17.1	52.8	
Spain	38.3	75	63
Taiwan	5	29.2	21
Turkey	5	46.6	16.1

to communicate effectively contributes to social inequity, although provision of services in community languages has helped address this issue in Australia (Clyne, 2005). Many migrant communities in Australia have also been able to establish, with varying degrees of success, language and culture schools to facilitate language maintenance and acquisition in subsequent generations of family members. However, as will be discussed in this chapter, these endeavours can be hindered by the late standardization and codification of languages (see Section 5), with greater difficulty in maintaining oral traditions in younger generations, particularly in literacy-focused societies such as Australia's. Consideration will also be given to the relationship between the sociolinguistic conditioning of the language in the homeland and outcomes for the language in the contact environment.

The second function of language is to express identity and relationships. Language allows people to show where they have come from and who they are. In migrant communities, developing bilingualism facilitates the evolution of new identities, with Clyne (2005, p. 32) arguing that plurilinguals need both or all of their languages to express their multiple identities. Multiple identities are also expressed through hybrid language varieties featuring transference and code-switching. These aspects of language varieties express not only linguistic variations but can also involve the incorporation of cultural behaviours (see Clyne, 2005, p. 32).

Thirdly, language also functions as a means of cognitive and conceptual development. This has implications for the late codification of languages and the supremacy of oracy over literacy in some cultures, but the development of bilingualism in migrant communities can also allow for an earlier and greater understanding of cultural relativity.

The final function of language discussed here, and referred to in this chapter, is the pragmatic performance of speech acts. Different languages and cultures have differing ways of achieving things, whether they be seeking support from interlocutors, expressing social relations, making requests, apologies, invitations, etc. Being able to interpret or interact between two languages can be challenging, particularly when late codification is involved (Clyne, 2005).

3.   Facilitation of code-switching through language contact

The phenomenon of triggering, or the facilitation of code-switching, has been examined as part of language contact studies since Hasselmo's work on Swedish in America (Hasselmo, 1961, 1974) and Clyne's on German in Australia (Clyne, 1967; Taeni & Clyne, 1965). One of the particularly interesting aspects is the fact that the same broad phenomenon – code-switching – enters different levels of language in different language contact pairs according to linguistic/typological criteria. As a general rule, overlapping items seem to facilitate switching between languages (Clyne, 2003a) and typological similarities between the languages in contact seem to be more conducive to code-switching.

In combinations of English with German, Croatian, Dutch, Vietnamese, Hungarian, Italian and Spanish, Clyne (2003a) identified the following items that are most likely to facilitate (or trigger) an inter-lingual switch in his Australian data (see also Table 3):

1. lexical transfers (loanwords) from English used in one or more other languages
2. proper nouns (names of people, places or titles of books) common to the languages, and
3. bilingual homophones: items that sound identical or almost identical in two or more languages or realized that way by speakers.

Table 3. Types of trigger-words in a number of plurilingual groups in Australia (% and no. of occurrences). Data from Clyne (2003a, p. 170), based on earlier studies

Groups	Lexical transfer	Proper noun	Bilingual homophone	Bilingual homophone with proper noun	Bilingual homophone with lexical transfer
German: postwar	62.2% (61)	14.3% (14)	23.5% (23)		
German: prewar	70% (28)	27.5% (11)		2.5% (1)	
German: settlements (sample)	47.3% (81)	31.5% (54)	7.6% (13)	8.8% (15)	4.1% (7)
Croatian	76.2% (32)	21.4% (9)	2.8% (1)		
Dutch	36.9% (38)	10.7% (11)	44.7% (46)	1.9% (2)	5.8% (6)
Vietnamese (sample)	50% (8)	50% (8)			
Italian (Italian/Spanish/ English trilinguals)	76.9% (10)	7.7% (1)	15.4% (2)		
Spanish (Italian/Spanish/ English trilinguals)	66.7% (4)	33.3% (2)			
German (German/ Hungarian/ English trilinguals)	67.4% (31)	19.6% (9)	13.0 % (6)		
Hungarian (German/ Hungarian/ English trilinguals)	66.7% (4)	33.3% (2)			
German (German/Dutch/ English trilinguals)	66.7% (8)		33.3% (4)		
Dutch (German/Dutch/ English trilinguals)	50% (8)	25% (4)	25% (4)		

Examples (1)–(6), drawn from data collected in Australia by Michael Clyne between the 1970s and the late 1990s, illustrate these three types of facilitators.

(1)   *Das ist ein Foto   gemacht an der **beach could be***
      That is   a   photo made   on the beach could be
                                                 ENG   ENG ENG

      *kann **be**   kann sein in **Mount Martha***
      can be   can   be   in Mount Martha
      GER ENG GER
      'That is a photo taken on the beach could be in Mount Martha.'

The lexical transfer *beach*, a term the participant uses in German and in English, triggers the switch here. This lexical facilitation both promotes and is promoted by contact-induced syntactic convergence between the two languages, in favour of English word order with the strict adjacent collocation of the modal verb *could*

and following infinitive *be*, supported by the following mixed collocation *kann be* and then finally the fully calqued word order here, *kann sein in Mount Martha,* instead of normative *kann in Mount Martha sein*.

Lexical transfers as facilitators also occur in the case of trilinguals, where all three languages interact. In Example (2) the trigger word *shops*, though English in origin, is used by the participant in all three languages, English, German and Dutch; the German and Dutch equivalents are never used. That is, for this speaker *shops* is part of all of his or her languages. Here it facilitates a switch from Dutch to German.

(2)   *Dan   ga   ik   naar   de   **shops**   einkaufen*
      then   go   I   to   the   shops   to shop
                          DUT   DUT   ENG   GER
      'Then I go to the shops.'

While lexical transfer is the most frequent trigger category for speakers of German, proper nouns are also relatively numerous in the recorded speech (referred to in Table 3) of German-English bilinguals in early German settlements in western Victoria (in the south of Australia) due to the frequent reference to personal and place names in both languages.

(3)   *Die   die   jüngste   ist   in   Portland   that's   Ruby…*
      the   the   youngest   is   in   Portland   that's   Ruby…
      'The youngest is in Portland, that's Ruby …'

Both types of trigger-words have a strong switching facilitation function in Dutch-English bilinguals, as in the following example where a proper noun, the title of a book, facilitates the switch to English:

(4)   *Ik   heb   gelezen   Snow   White,   Come   Home.*
      I   have   read   Snow   White   Come   Home
      It's about a winter-pet.
      'I have read *Snow White Come Home*. It's about a winter-pet.'

However, Dutch-English contact has also generated a different pattern: *bilingual homophones* predominate as trigger words among these bilinguals. This is due on the one hand to the relatively close similarity between Dutch and English, especially as spoken by adult Dutch immigrants (lexically, phonologically and morphosyntactically; cf. Clyne, 2003a, pp. 132–136). In addition, the strong acceptance of most Dutch immigrants of the Australian assimilation policy of the 1940s-1970s (see various papers in Peters, 2006), and other factors already noted above, have led to an exceptional rate of language shift (see Table 1 and Table 2). This, in turn, encourages lexical transference and particularly convergence towards L2 English, so that the second generation

members of the community who do not speak Dutch can still participate in intergenerational conversations. Thus, in Dutch, unlike in many other migrant languages examined, what one might term bilingual homophones (including Dutch-accented homophones) are often the result of convergence and overlap rather than lexical transference, which makes it very difficult to identify which items are Dutch and which are English.

In Example (5), for instance, only *one of* and *plaatsen* are clearly in English and Dutch respectively and the other items, given the shared Dutch accent, could be in either language.

(5) **Dat's** **one** **of** **de** **nieuwer** **plaatsen** **in** **Holland.**
    that's one of the newer places in Holland.
    ? ENG ENG ? ? DUT ? ?
    'That's one of the newer places in Holland.'

(6) *I don't know* **what/wat** *ze doen.*
    'I don't know what they do.'

Phonological convergence and lexical similarities between the two languages are apparent in items such as *wat*, *is*, *was*, and *the/de*, which are homophones in the speech of many Dutch-English bilinguals, and act as trigger words and facilitate code-switching; see Example (6).

A further typological aspect governing language-contact effects in code-switching and borrowing is the question of linguistic integration. Languages requiring a high level of integration of lexical transfers have less potential for switching facilitation. Hungarian is such a language; it requires a much higher degree of morphological integration than German (and Dutch), as the examples in Table 4 illustrate.

Table 4. Examples of required morphological integration of lexical transfers from English into Hungarian and German

Hungarian	German	English
*szép swimmingpool**at*** (accusative)	*einen schön**en** Swimmingpool*	*a nice swimming pool*
*Aclandstreet**re*** (sublative)	***in** die Acland Street*	***to** Acland Street*

This is borne out in our Hungarian-German-English trilingual data, which allow us to compare the code-switching behaviour of the same speakers between these languages. These trilinguals switch as the result of a trigger-word a total of 46 times from German to English and only six times from Hungarian to English, illustrating that the suffixation required in Hungarian makes lexical transfers less likely to facilitate code switching (see Table 3).

In addition, data from the tonal languages Vietnamese and Mandarin in contact with the non-tonal language English indicate that specific prosodic features can facilitate switching. Ho-Dac (1996, 2003) found that 85% of switches occurred where the Vietnamese lexical item immediately before the switch is in a mid to high pitch tone. Incidentally, Vietnamese speakers are most likely to equate these tones with English pitch and stress – unstressed syllables with mid tones and stressed syllables with high tones – i.e. it is this tonal range which overlaps in the two languages. Zheng (1997) reported similar results for Mandarin-English language contact, where falling and neutral tones facilitate switching; 97% of switches in her corpus follow such tones, again corresponding to English pitch and stress (examples in Clyne, 2003a, pp. 175–176).

Data from a range of language pairs show the extent of switching after different kinds of trigger-words. Each additional combination of languages adds to our knowledge of contact phenomena and plurilingual processes. So while the Dutch-English data give us better insights into the effects of convergence, the Hungarian-German-English data show the influence of integration of lexical transfers, and data from tonal languages in contact with the non-tonal language English indicate that tonal factors can facilitate switching. Overall, "relatedness and structural correspondence contribute [to facilitation] as they increase the potential for overlap" (Clyne, 2003a, p. 169) and it is the linguistic typologies of the contact languages that make triggered code-switching possible, with sociolinguistic factors playing what appears to be a more subordinate role.

4. Pragmatic effects in the expression and performance of speech acts and social relations

4.1 Modal particles and discourse markers

We now move on to some pragmatic aspects of language use, in which, by implication, sociocultural factors are expected to play a bigger part. The two areas considered are (a) the use of modal particles and discourse markers, and (b) address practices.

Some languages, such as German, Dutch and Hungarian, are well known for having modal particles (MPs) – uninflected words which express culturally conditioned attitudes towards a proposition in relation to the interlocutor's assumed attitude (Kiefer, 1988).

(7) *Das schadet   **doch** nicht, wenn des deutsch   ist?*
     that damage+3SG MP   not   when it   German is
     'It doesn't hurt if it's in German, does it?'

The German MP *doch* in Example (7) is used to establish consensus by alluding to a presupposition, although one the speaker is rather uncertain of and seeks

confirmation from the interlocutor. Other languages such as English employ discourse markers (DMs) to express such attitudes. The lexicalized phrase *you know*, for instance, is most often used to establish consensus by alluding to common ground and to knowledge shared by the interlocutors (Schiffrin, 1987, p. 102). Neither MPs nor DMs contribute to the propositional content of an utterance.

Clyne (2003a, pp. 222–232) compared the use of modal particles by bilingual and trilingual Australians with two or more languages out of English, German, Dutch and Hungarian. Two developments were noted: on the one hand, some MPs are dropped from the immigrant languages; on the other hand, English DMs are adopted and transferred into the other languages. Consensus-imposing particles are the most likely to be first abandoned. Examples are *doch*, *ja* and *wohl* for German (all seeking agreement with a presupposition, albeit expressing varying degrees of certainty), *even*[2] and *hoor* for Dutch (similar to the German MPs but much less strong), and *dehát*, *ugye* and *csak* for Hungarian (*ugye* presupposes some doubt as to the validity of the proposition, *csak* implies that the speaker has changed position to doubting the proposition (Kiefer, 1988), and *dehát* has an adversative function). Clyne (2003a, p. 233) argues that such consensus-imposing MPs are so easily dropped because they do not comply with the mainstream Australian (English-speaking) way of communicative behaviour which favours individualism (rather than consensus imposition), and the expression of caution, indirectness and hedging.

On the other hand, those English discourse markers which reflect an adaptation of mainstream Australian behaviour – e.g. the frequent use of cautionary markers such as *well, you know*, *sort of*, *anyway* in particular – are most likely to be transferred into the other languages.

The system of MPs in German, Hungarian and Dutch and the system of DMs in Australian English thus differ not only in structure and function, they also express "different types of communicative behaviour" (Clyne, 2003a, p. 231). Here it is at the interface of language and culture in society that a change occurs in the bilingual situation, when bilinguals move away from the communicative conventions of the community language, towards adopting those (and associated cultural values) of Australian English. This is also the case in address practices, discussed in the next section.

4.2   Address

An instance of how linguistic and sociolinguistic factors are bound up in contact situations is the relative complexity of the address system. Address is a sociolinguistic feature which can be expressed lexically and which is underpinned by cultural

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2.   Despite the spelling, Dutch *even* is not a phonological homophone with English *even*.

values such as family loyalty, respect for elders, harmony and/or a quest for social equality. Almost all languages in the Australian context other than English have more complex address systems, including at least two pronouns of address, e.g. French *tu* versus *vous* and German *du* versus *Sie* in the singular. Following Brown & Gilman (1960) and based on French, the more formal pronoun is often referred to as V (*vous*), the less formal as T (*tu*). In many languages, these pronouns also require different verbal morphology.

In the Australian context, difficulties in deciding whether to call others by the T- or V-pronoun will often have the effect of plurilingual speakers avoiding German, Dutch or Italian, for example, and of them shifting to English, particularly in communication with strangers. This happens especially among children and young people, i.e. second and third generation speakers, who are not very accustomed to the use of the formal pronoun of address, having acquired and used the community language within a network of family and close friends. This can be exacerbated by embarrassment experienced following overgeneralized use of the T-pronoun. A shift to English is also encouraged by the widespread use of first names in Australia, creating dilemmas about the choice of pronoun that are avoided by the use of English, even in intra-ethnic communication. In such cases, this easily leads to or favours language shift from the community language to the national language, English.

Vietnamese, on the other hand, shows a different pattern. While it has a far more complex address system than English or the European languages mentioned above, Australian-Vietnamese speakers tend to avoid it by code-switching. Vietnamese has a set of lexical alternatives – common nouns, proper nouns, and personal pronouns – all representing kinship and social status and employed for addressor, addressee, and third party reference. According to Ho-Dac (2003), the term to denote the appropriate degree of solidarity is difficult to determine and must be done through the Confucianist name rectification doctrine. Under this, role terms such as *king*, *father*, and *child* are mandatory in relation to the social function of the person. Some pronouns such as *tao* 'I' and *máy* 'you' can express both hostility and reinforce solidarity. As Ho-Dac (2003) shows, English pronouns such as *you* and *me* are transferred into Vietnamese to avoid any negative connotations of Vietnamese equivalents or to withdraw from uncomfortable relationships existing in Vietnamese (see Tadmor's chapter in this volume, where this same phenomenon is discussed relative to malay).

In sum, two outcomes are observed in situations where address systems of community languages are in contact with Australian English: language shift and code-switching (or pragmatic transference). While issues of linguistic typology (single pronoun address system versus multiple pronouns versus multiple nouns and pronouns) cannot be neglected, sociocultural factors seem to be equally or even more influential when moving from the communicative conventions of the community language to those of Australian English.

5.   Standardization and codification

So far we have focused on issues of linguistic typology in bilingual situations where there is an interface and interaction with sociolinguistic/sociocultural factors. Beginning with standardization and codification, the following sections consider some potential features of a sociolinguistic typology and how they may be reflected in bilingual behaviour in an immigrant context, such as in Australia.

Standardization is a form of corpus planning establishing the norms of that variety of a language used for formal purposes, such as law, administration, education, religion, the media, and non-fiction literature. *Codification* is also a form of corpus planning. It defines the norms of the language, in the lexicon/orthography, morphosyntax and/or phonology of the language through codices such as a dictionary, grammar and/or pronunciation guide (Ammon, 1989).

For many European languages, standardization was often the result of 19th and early 20th century European nationalist movements, where a particular language was declared a national language (status planning) and its corpus defined by state bodies (corpus planning) such as the *Académie française* (Kloss, 1969). In some instances, codification was a precursor to the declaration of nationhood, as was the case for Hungarian, Czech and Ukrainian, or in others, a consequence of nationhood, as occurred for French, Norwegian and Letzebuergesch. The codification may be a completed process or one that is still in progress. Many of the immigrant languages in Australia, especially ones of European and Asian origin, have a long history of standardization and codification; immigrants with languages such as French, German, Spanish, Polish, Russian, Mandarin, and Vietnamese have migrated with fully codified systems.

Across many African nations, standardization and codification have been fraught, post-colonial events, where nations have had to decide whether to maintain the colonial language or whether to promote one of the indigenous languages as the national language. In these highly multilingual contexts, a wide range of official languages can work alongside other indigenous languages as well as lingua francas, with late or delayed standardization and codification of many languages. Many of the languages from the Horn of Africa brought to Australia by recent refugees have not yet been completely codified. Examples include Dinka and Nuer from the southern Sudan and Oromo from Ethiopia (for Dinka, see Idris, 2004). The late codification reflects multilingual competition in the country of origin and restricts the status and the functions of language, as discussed in the introduction, including communication, cognitive and conceptual development, and the performance of speech acts (action). These restrictions, in turn, limit the scope of language maintenance in the country of immigration.

No matter which functions they can perform extremely well, non-standardized and uncodified languages will generally be treated as inferior by both the in- and the out-group in a contemporary language contact situation. Speakers are often forced to use another language to fulfil important everyday communicative functions in a contemporary literate society, including those involving their rights and responsibilities as citizens. Given that non-standardized and uncodified languages will not usually be used for the purposes of instruction in schools in the home country, the development of conceptual and cognitive functions performed by the non-standard varieties will be severely impaired. As there is generally a strong correlation between incomplete or late codification and low literacy levels, already socioeconomically disadvantaged groups such as Sudanese refugees in Australia and elsewhere will not have the benefit of cross-linguistic literacy transfer in the acquisition of the national language of the country of immigration. Furthermore, once in Australia, attempts at standardization and codification can continue to be stalled by critical socio-historical and cultural variables. Efforts to codify the Sudanese language of Dinka, for example, are hindered by significant dialectal variation, and the lack of a universally accepted orthography, complicated by different practices associated with differing Protestant and Catholic missionary traditions (Musgrave & Hajek, 2013).

In looking at language contact research in Australia, the tacit assumption is normally that we are dealing with two well-defined and completely codified languages in a competition situation. This is certainly not always the case. Where the language has only recently become standardized and/or codified in the country of origin, existing vintages of immigrants in the diaspora will have left their homeland before codification, or have received whatever education they might have prior to codification, and therefore experience the above deficiencies of non-standard and uncodified languages. This, in turn, impedes communication across the diaspora community. Languages with a strong literary tradition may be maintained better because it gives people access to the Internet, with many more opportunities to use the language and to keep in touch with the heartland and emigrant communities worldwide, as McClure (2000) has shown for Assyrian. Locally, however, if standardization and codification have been delayed, the immigrant language is more likely to be transmitted and maintained orally than in writing (Clyne, 2003b, pp. 46–47), and the language will have more limited use, if any, in virtual communication, thus isolating speakers within their diaspora community. A further feature of these languages is that they are often associated with a rich oral tradition, which may not be valued by the younger generations growing up in a new, literate and virtual society. In some cases, confusion over norms and conflict about the status of particular varieties will continue in the migration country (e.g. Dinka referred to above), thus lowering the status of the language among immigrant languages and its vitality in the new context.

Macedonian and Somali comprise two further examples from Australia of late codified languages from different parts of the world, with different outcomes (Clyne & Kipp, 2006). The language known today to linguists as Macedonian is a South Slavic language closely akin to Bulgarian and Serbian and originating in the multicultural Macedonian region. While Macedonian literary texts date back to the late eighteenth century, the major push towards codification began with the rise of nationalism in the late nineteenth and early twentieth century, when here too, language became the symbol of aspiring nationhood. With the partition of the Macedonian region between Greece, Serbia and Bulgaria following the Balkan Wars (1912–13), each administration treated Macedonian language and culture differently – Greece was completely hostile to and intolerant of all minority languages but most particularly of the language they termed *Slavic*, as *Macedonian* was a name to which Greeks believed they had ancient propriety rights (see below), projecting it as 'roofless' dialect in Kloss's (1978) sense. Bulgaria saw Macedonian as part of Bulgarian, Serbia instead considered it similar but inferior to Serbian because of its less rich morphology. The opportunities for codification were thus limited until Tito's post-second world war Yugoslav Federation proclaimed the Macedonian Republic as one of its constituent republics. Most of the codification of Standard Macedonian took place between 1945 and 1950 (Friedman, 1998) with the standardization of orthography, the establishment of norms, and lexical expansion on the *Ausbau* principle (Kloss, 1967), both drawing on the west-central dialects around Prilep and Veles and incorporating a strong Turkish legacy, all differentiating the language maximally from both Bulgarian and Serbian.

Somali, an East Cushitic language of the Afro-Asiatic group, is spoken in the Somali Republic and adjacent areas of Ethiopia, Kenya and Djibouti. Although the Somalis are unusual in Africa in having a 'common language', there is considerable variation, but on the basis of phonological, lexical and morphosyntactic isoglosses, the main differentiation is between two broad (supra-)varieties, *Mahaad-tiri* and *May* (used in the south). Somali linguistic emancipation was slow due not only to British and Italian colonial rule but also to the Somalis' strong identification with Islam, which means that the advancement of the Somali language has also been restricted by Arabic. For several decades in the twentieth century, controversies about the choice of a script provided a diversion from other aspects of codification and standardization. From 1971, status and corpus planning commenced in earnest. This has included the publication of a Somali grammar and dictionaries, the development of specialized vocabularies, the production of school textbooks, and the foundation of a Somali-language government daily newspaper to replace earlier newspapers in English, Italian and Arabic (Andrzejewski, 1971; Laitin, 1977; Puglielli, 1995). Standard Somali ('common Somali') as it was codified, is more similar to Mahaad-tiri and is fully mutually intelligible to its speakers. This disadvantages May speakers. There are also issues of identity that are associated with the

long and bloody civil war in Somalia that continues today. Ironically, according to a recent study of Somali, May is actually better maintained in Melbourne than is Mahaad-tiri (Clyne & Kipp, 2006, pp. 75–78).

Macedonian and Somali are both among the best maintained languages in Australia (see Table 1 and Clyne & Kipp, 1997; Kipp & Clyne, 2003). Second generation shift statistics are not available from the 2006 Census, but it is unlikely to be much higher than the 14.8% in 1996 for Australian-born people with parents born in the (former Yugoslav) Republic of Macedonia (Table 2), making it the most retained language in the second generation on which such information is available. The shift of only 4.5% to English as the home language among the Somali-born (Table 1 and Clyne, 2011), may be attributed mainly to the recency of arrival of Somali speakers. An in-depth study (Clyne & Kipp, 2006) showed anxiety among Somali parents that their children are unable to communicate meaningfully with them in Somali, even though it is still the home language. The community is also concerned about the lack of interest of the children in their oral culture, which has been supplanted by the literacy-based culture of Australian society and the Internet and by the attractions of globalized TV originating from the United States. As discussed above, the late codification of the language and limited literary tradition limits its role as a medium of communication on the Internet and through social media. Additionally, the Somali speakers do not enjoy the same access to language resources that are usually afforded to socially disadvantaged immigrant groups in Australia. Somali is not at present a Year 12 examination subject and there are limited radio and TV programs and public notices in the language. One of the major reasons behind all this is the lack of demand perceived by authorities. This may, at least in part, be attributed to the lack of group cohesion, symbolized by the ongoing diasporic competition between the Mahaad-tiri and May varieties and therefore related to the codification process in the country of origin.

Macedonian speakers in Australia are a much more established community, who came in two vintages, those from northern Greece migrating in the late 1950s and early 1960s and those from the then Yugoslavia arriving in the late 1960s. The first vintage had not had the benefit of literacy in Macedonian though some of them were literate in Greek. They did have a strong determination to maintain the language, which, in fact, has led to its strong active use in the second generation, albeit with weaker active use in the third. The first generation of Macedonian-speaking migrants infected the second vintage with their determination and it was this second vintage, with education, literacy, and knowledge of norms in the language that provided the linguistic models for the community (Clyne & Kipp, 2006).

One interesting aspect of the older generation from the vintage of the pre-codified language is that many of them have acquired literacy in Macedonian from the community in Australia, in some cases from children or grandchildren who have learned the language at school (in some cases in a bilingual program) or at a community language school. The difference between the Macedonian language from Greece and the Somali language is that the former was uncodified while the latter was codified but the codification was not accepted by all.

Language changes slowly, beginning to do so or at least latent in the homeland and accelerated in the contact area (Clyne, 2003a, pp. 132–134). However, as the examples of Dinka, Somali and Macedonian have illustrated, it would appear that the sociolinguistic conditioning of the language in the homeland may determine the situation of the language in the contact environment. This is an issue that will be explored also in relation to pluricentric languages and diglossia.

6.   Pluricentric languages

Pluricentric languages are languages with several interacting centres, each providing a national variety with at least some of their own (usually codified) norms. They are unifiers and dividers of people and act as identity symbols for people from different countries. National varieties of pluricentric languages are generally not symmetrical in status, some having to rely on exonormative planning. For example, there is widespread perception that the status of Austrian German, Angolan Portuguese and Flemish (Belgian) Dutch is not as high as that of German German, Portuguese Portuguese and Dutch Dutch respectively. This asymmetrical pluricentricity is determined by demographic, political, and economic power and associated sociolinguistic prestige. Given the weight of these factors, national varieties of dominant nations have better opportunities for codifying and propagating their norms (e.g. through dictionaries, publishing houses, language institutes). This gives the impression that these national varieties are more correct and their norms more rigid (Clyne, 1992; Muhr & Delcourt, 2001; Muhr, 2001).

How does this translate into language maintenance and shift? Are, for instance, different national varieties of the same language maintained equally well? In Australia, this is the case, almost dramatically so, for the German and Austrian varieties of German with almost identical shift rates (see Table 1 and Table 2). On the other hand, there is a considerable difference in Spanish: a fairly high shift among the Spanish-born and their children and a low shift among those of Chilean and Salvadorian background; Mauritian-Australians use French more than do French-Australians; those of Iraqi background maintain Arabic more

than those of Lebanese background[3] who in turn shift to English less than those of Egyptian background (see Table 1). The reasons are political and historical rather than related to sociolinguistic features (Clyne, 2003a, pp. 23–34; Clyne & Kipp, 1999), and include migration vintage and reasons for migration. Even so, this shows that the shift from different national varieties of pluricentric languages to English varies and that it is often (as in the case of French and Spanish) not the most prestigious national variety that is best maintained.

Despite the lack of clarity of pluricentricity as a sociolinguistic factor in relation to language shift rates, there are instances in Australia where the pluricentric language has provided a basis for a joint identity, which may over time become more significant than the one around the country of origin symbolized by the national variety. In particular, the ethnic media, language in education, and community language specific social services have been areas in which a pluricentric language, e.g. Spanish, has been both an object and instrument of solidarity. On the one hand, Hughson (2009) has examined the address routines of groups of Spanish-speaking immigrants in Melbourne speaking different national varieties of Spanish which have different address systems. She found a tendency for the speakers to lose the significance of the address pronouns, code-switch between the systems of different national varieties, and combine pronouns from one variety with morphological endings from others. However, in another study, Clyne, Fernandez, & Muhr (2003) found that speakers of the German and Austrian national varieties of German did not change the pragmatic rules of their original varieties even after long periods in Australia and marriage to a person from another national variety. The German-language study is again an indication of the close interaction of language and different cultural practices, whereas the Spanish one obscures this.

7. Diglossia

If late codification limits the functions of a language, whether communication, identity, cognitive and conceptual development or social action, the earlier precodified situation is generally reflected in a diglossic relationship between the language concerned and another, superposed one. Diglossia is one conventionalized

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3. It is important to note that there are likely to be other variables than pluricentricity at play in this context. It is not possible to know the different levels of shift to English within different religious communities from Lebanon (e.g. Maronite, Shia, Sunni and Druze) but these might differ.

way of expressing this, as is suggested by Macedonian and Somali evidence (see Section 6 above). Ferguson's (1959) original framework described the rigid differentiation in some societies between closely related L(ow) and H(igh) varieties that everyone employed to fulfil everyday and formal functions respectively. The original framework has sometimes been extended to include less rigid forms of functional specialization and less closely related, even unrelated pairs of languages (see Hudson, 2002 and generally the papers in the *International Journal of the Sociology of Language* 157), and some diglossic situations (e.g. Greece, Switzerland) are now different to those in 1959. The distinction between H and L is, however, still a useful one.

How does a diglossic background translate into language maintenance and shift? Where three languages are in contact, with English in competition with both H and L, the least useful of the three in terms of cost-benefits may be abandoned. Such cost-benefits may relate to questions of identity as well as to economic benefits (Clyne, 2003a, pp. 67–68). In cases where immigrants have come to Australia with diglossic language pairs, immigrant language contact situations seem to tell conflicting stories about the outcomes. Pauwels (1986) compared two traditionally dialect-speaking groups, Limburgers from the south-east of the Netherlands, and Swabians from south-east Germany – with Standard Dutch and High German respectively as their H varieties. Limburgers, whose Limburgs dialect they consider to be very distant and functionally separate from Standard Dutch, are much quicker to shift to English across domains (including in communication with compatriots) than the Swabians, who accept a fluid continuum between dialect and standard. The Limburgers identify Limburgs and not Dutch as 'their' language and a rigid diglossia separates them from the rest of the Dutch-Australian community. The same can be said for the Swiss-German situation in Australia (Schüpbach, 2008).

The situation among Italian immigrants who came to Australia in the 1950s, mainly from rural areas of Calabria, Sicily, and Veneto, is less clear-cut. It should be remembered that when Italy was unified in the 1860s, only 2.5% of the population spoke Italian. Most Italian immigrants of the 1950s still spoke dialect as their language of everyday interaction before they left Italy. Bettoni & Rubino (1996) demonstrate the differing functions of the three codes – dialect (L), Standard Italian (H), and English – among Sicilian and Venetian immigrants in Sydney: Italian has become the interregional language employed in the more public and formal domains, while dialect is for communication with (mainly Italian-born) people of the same regional background (see Bettoni, 1985). The choice between English and dialect is often domain-specific. The use of dialect to younger relatives is found more among Venetians, especially women, but English is often preferred. Three-generation studies, such as Finocchiaro (2004) in Melbourne, show that if

an Italian variety is now maintained, it is the standard language, thanks to the teaching of Italian in schools. As Cavallaro (1997) explains, parents often leave language maintenance to the school system and neither Standard Italian nor dialect is used by the second generation outside school, except to a limited extent in the extended family. Nevertheless, Italian has become the symbol of Italian-Australian ethnic identity and the L variety (i.e. dialect) is being displaced by English, in part by an Italian ethnolect of Australian English based on lexical (and sometimes phonological and syntactic) transference from Italian into English, as an in-group symbol (Cavallaro, 1997; Finocchiaro, 2004).

In the case of Arabic, diglossia is still very well established, with the colloquial national (and regional) L varieties quite distant from Modern Standard Arabic, the H language. Arabic-speaking immigrants have come to Australia from (in numerical order): Lebanon, Egypt, Iraq, Palestine, and other parts of the Middle East (Clyne & Kipp, 1999). Also distant and distinct from the colloquial varieties are the religious classical varieties Koranic Arabic and Maronite Liturgical Arabic, which are not acquired productively but are known as texts or formulaic expressions (see the papers in the *International Journal of the Sociology of Language* 163). The difficulties that second and later generations have in learning Arabic (as well as the relatively few learners from non-Arabic backgrounds) are a consequence of this particular diglossic situation. They do not have the benefit of exposure to people who can speak the standard language, which is quite distant from the national variety they speak at home. Thus, the gravitation towards the standard language that occurs in the Italian community does not have a parallel in Arabic.

Unlike Ferguson's conceptualization, Fishman's (1967) diglossia does not entail a close genetic relationship between the H and L languages and could be applied to a specific type of diglossia with the ethnic or national language as L and English as H. This applies in certain post-colonial situations such as India, Sri Lanka, Malta, and Singapore. In the case of another post-colonial situation, that of the Philippines, for many speakers it is really triglossia with two H languages, English (H1) and Filipino (H2); L, the language of everyday communication, is one of the 285 regional languages of the Philippines. Filipino (H2) is the third of a series of attempts to create an autonomous and indigenous national language, drawing on Tagalog, the regional language spoken around the capital Manila, as the basis but to a larger or lesser extent incorporating features of other regional languages (Gonzalez, 1998). However, in Australia, social networks of regionally mixed Filipino origin and the need for a marker of ethnic identity have meant that Filipino has become the symbol of Filipino-Australian identity. Nevertheless this did not prevent large-scale language shift in both the first and second generations in which a substantial gender imbalance has played an important role. Sixty percent of Filipino speakers in Australia are female (due to the importation

of Filipina brides by many non-Filipino background males); however, 13.4% of Filipino speakers in Australia in 2001 were under the age of 15, testifying to considerable retention prompted by a mother or perhaps a grandmother.

In the case of Tamil-English diglossia, a study in Melbourne (Fernandez & Clyne, 2007) suggests that the value attached to the adopted language, English, in the Sri Lankan or Indian homeland, encourages the shift towards it in Australia.

Maltese-English diglossia at the time of large-scale Maltese migration to Australia in the early 1950s has resulted in a high language shift among a group which saw its identity as differentiated from other southern Europeans by their British passports and their prior knowledge of English. A brief 'ethnic revival' in the 1970s (the term originated in Fishman, Gertner, Lowy, & Milán, 1985) was pushed by two identity-related factors – the independence of Malta, resulting in the end of diglossia leading to the use of Maltese in formal domains, and the proclamation of multiculturalism as a policy in Australia. Following the example of Italian and Greek groups, the Maltese community lobbied for Maltese in some primary schools, Maltese as a final secondary school subject, a Maltese community language school in Melbourne, Maltese radio programs, and for a university subject, which was short-lived. Although some Maltese-Australians started learning the language and the use of English only in the home decreased between 1976 and 1986, all this only had an ephemeral effect on language maintenance rates, as shift was already too far advanced (Clyne, 2003a).

Diglossia in pre-immigration contexts thus has differing effects on language maintenance in Australia depending on the languages or varieties in contact. Pre-immigration diglossia with English as H and the immigrant language as L, e.g. as in Singapore, will further diminish the position and level of knowledge of the latter in Australia. Where H is a language other than English, either H or L or both may be displaced by English. In the case of Filipino pre-immigration triglossia, the outcome has commonalities with both of the above. On the whole, however, it appears diglossia is a disincentive to long term plurilingualism in the Australian context.

8. Language as a core value

The relativist theories of Humboldt (1876), Whorf (1956), Sapir (1921), and others, broadly covering the notion that different languages produce different experiences and world views, would apply to all languages and cultures. Speech communities and individuals will often see their own language in special terms, as Fishman (1997) has documented from the writings of speakers of many languages. However, a more objective typological, but also identity-focused differentiation may

be found in Smolicz (1981) and later publications by the same author and his colleagues. Smolicz argued that each cultural group has particular values fundamental to its continued existence and to the membership of individuals. Some cultures place more value on their language as a cultural core value; for others, religion or family cohesion may be more crucial. The Dutch community in Australia is a classic case where family cohesion is highly valued but does not require the Dutch language to be maintained, as confirmed by the elevated degree of language shift seen previously in Table 1 and Table 2 (see also Clyne, 2005).

In the evolution of the concept of the core value theory, a number of modifications have taken place. Smolicz and his associates have made allowances for the intertwining of core values such as language, religion, and historical consciousness. In response to criticism that not all groups with language as a declared core value maintain their language in a minority situation, Smolicz, Lee, Murugaian, & Secombe (1990) have also differentiated between: (1) general positive evaluation – regarding the language as a core value but not being prepared to learn it, and (2) personal positive evaluation – putting the ideological stance into practice. They have also accepted that (religious) sub-groups within a cultural community (such as Tamil Hindus and Tamil Christians) may have different positions on whether language is a core value or not (Smolicz et al., 1990). Different generations contribute such sub-groups (Smolicz, Secombe, & Hudson, 2001). Katsikis (1993, 1997) found that, while second generation Greek-Australians regarded the Greek language as the one with which to honour the elders, her third generation informants on the whole did not consider the language to be crucial in the survival of Greek culture. Studies of Arabic, Chinese, and Spanish speakers in Melbourne, e.g. Clyne & Kipp (1999), demonstrate a declining commitment to language as a core value among those under 35 years of age.

In the case of Somalis, their overarching cultural value is Islamic religion (Laitin, 1977, p. 263; Arthur, 2003; Clyne & Kipp, 2006). The fact that Islam attaches strong cultural significance to Arabic as a sacred language (Clyne & Kipp, 1999, pp. 154–155, 211), and considers it the language of Allah as well as that of the Qur'an, detracts from the Somali language as a cultural symbol. As in other groups, sooner or later a dual identity expressed by two languages brought to the immigration country is unable to resist the pressure of the additional language and identity acquired in that country, so a choice has to be made between the two pre-immigration languages and between language and religion. This choice has been made by a wide range of groups, including Dutch Calvinists and the pietist Templars who came to Australia from Swabia (Württemberg, Germany) via the Middle East. Almost invariably, religion is retained at the expense of language.

But let us consider again the intertwining of language and culture. This is the motivation for the low language shift rates from Arabic, Greek, and Macedonian,

all of which can be regarded as descending from what Fishman (1991, p. 360) terms 'religious classics'. In each case it is not the vernacular that is employed for religious purposes. Yet the religious variety is seen as linked to, and the ancestor of, the vernacular and therefore gives it authenticity. In this way, Arabic, Greek, and Macedonian all have respective claims to authenticity as the language of the Qur'an, the New Testament and European Antiquity, and the Old Church Slavonic Liturgy. In the case of Hebrew, it has provided a symbol of identity within the Jewish community through the separate values of Judaism (Jewish religion) and Zionism among people who do not have direct family links to the home use of the language. On the other hand, McNamara (1987) shows that Israeli immigrants are more likely to shift from Hebrew because of the negative attitudes in the Jewish community towards people leaving Israel.

The notion of language as a core value can give us a sociolinguistic typological focus from which to consider the important issue of language maintenance, while always bearing in mind the potential impact and competition of other, cultural factors such as the role and weight of religion as a core value.

9.   Concluding remarks

The complex migration setting of Australia that has now lasted for many decades, and continues to develop, provides us with an invaluable sociolinguistic laboratory within which to investigate language contact across a wide range of settings and languages. What is particularly interesting is what happens to languages and their speakers when they leave their homeland (and the sociolinguistic and cultural settings operating there) and settle in Australia, where English is dominant, and where shift to English is for many communities an increasingly evident outcome over time.

Evidence we have provided indicates that in the case of switching facilitation (triggering) it is the linguistic aspects (lexical, morphosyntactic, prosodic) that play a key role, although such things as assimilation attitudes (Dutch) also co-determine switching. The pragmatic features *modal particles/discourse markers* are at the intersection of the linguistic and the sociocultural with social adaptation promoting language change. Differing cultural and linguistic practices with respect to address favour switching to English and the adoption of Australian norms and/or forms for speakers, especially of the second and third generations, to avoid traditional complexities they are uncomfortable with in Australia.

Of the features of a (more) sociolinguistic (and cultural) typology, e.g. standardization, pluricentricity, diglossia and language as a core value, they can also be seen to interact with language change, shift and code-switching in Australia, but

not necessarily in the same way for different migrant communities. For instance, what is a strongly held core value for one generation or community, e.g. language (Greek, Macedonian), may not have much weight in another (e.g. Dutch) – the difference leading to significant variation in language use and maintenance when other factors such as length of settlement are controlled for. Nevertheless, all of these sociolinguistically relevant factors demonstrate how developments associated with the homeland are still able to have an impact on language attitudes, use and maintenance in the immigration country (Australia).

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Grammar and geography

Topography in language

Absolute Frame of Reference and the Topographic Correspondence Hypothesis

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This chapter re-evaluates the notion of absolute Frame of Reference (FoR) in spatial language. It reassesses Levinson's widely accepted definition of absolute FoR as involving bearings that are fixed, abstract and arbitrary, and that absolute FoR involves a binary relation. The chapter argues instead that absolute FoR is a ternary relation, not a binary one, and that absolute systems need not be fixed, and are not definitionally abstract or arbitrary. It argues that Levinson's definition is stipulative, and that a range of operationally identical systems exist, some of which conform to Levinson's criteria, others of which do not. It presents a new operationally-based definition of absolute FoR which may be applied consistently across a range of spatial systems whose status in terms of FoR have been controversial or difficult to categorize. The chapter presents evidence that rather than an arbitrary abstract relation, absolute spatial references involve an anchor point or points in the external world. Formulating this as a Topographic Correspondence Hypothesis, the paper argues that absolute spatial systems are not merely anchored in, but motivated, at least in part, by the external physical environment. The paper concludes by proposing an Environment Variable Method to test this hypothesis.

1. Introduction[1]

All languages have means by which speakers can refer to spatial relationships. These include, among others, deixis (*the book is over there*), or reference to a

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landmark (*the book is by the TV*). However, all languages also have one or more systems of expressing the relationship between objects in physical space, or the paths that moving objects take, using a conceptual system called Frame of Reference. Three Frames of Reference have traditionally been identified. One of these, absolute Frame of Reference, depends on orientation on the basis of concepts external to the objects being located – such as *east* or *upriver*. The bearings employed in absolute spatial references have traditionally been assumed to be arbitrary abstractions. However, such systems typically make reference to phenomena in the physical world outside the objects being located, and outside the linguistic system used to express those relations. This chapter examines the standard definition of absolute Frame of Reference, arguing that rather than inherently involving fixed arbitrary abstractions, absolute systems are anchored in features in the external world, and that they are motivated by those features. It argues that features of absolute linguistic systems correlate in predictable ways with features in the external world. These ideas will be formulated in a Topographic Correspondence Hypothesis, along with a methodology for testing the hypothesis, and some preliminary findings.

2.   Frames of Reference

A *Frame of Reference* (FoR) is a strategy for locating or orienting an object or path in relation to another object. As Terrill & Burenhult put it, "[f]rames of reference are coordinate systems for expressing the spatial relationship between Figure and Ground" (Terrill & Burenhult, 2008, p. 93). In (1), for example, one object, the car, is located in relation to another object, the house. This is done by means of the term *in front of,* expressing a concept that invokes a particular FoR.

(1)   *The car is in front of the house.*

Levinson (2003, pp. 34–53) operationalizes the notion of Frame of Reference as follows. The object to be located (e.g. *the car* in 1) is the *figure* (*F*), also known as the *referent*. This referent is to be located by means of its relationship to another object, the *ground* (*G*), also known as the *relatum* (*the house* in 1). The referent is located in relation to the relatum by means of a *search domain* (or *path*, see Section 3) that is projected off some facet of the relatum (in 1 its *front*). An *anchor point* (*A*) locks labelled coordinates into the coordinate system.

A FoR is therefore in effect a strategy for projecting a search domain or path off a relatum (or in some instances off a referent, see Terrill & Burenhult, 2008, p. 120). The search domain or path is projected off the relatum by imposing an asymmetry on the scene in which the relatum and referent are located. In (1),

for example, the car is located in a search domain projected off the house, off a named facet of the house, its *front*. Note that in (1) the asymmetry assigned to the scene is assigned to the relatum itself. This need not be the case, as discussed in Section 4.

3. Static and dynamic relations

Discussions of Frame of Reference typically make reference to spatial relationships in which one stationary object is located in relation to another stationary object. I will term this a *static relation*. However, FoRs also operate in relations in which an object is moving. I will term this a *dynamic relation*.

In static relations one entity, the referent, is located in relation to another entity – the relatum. A search domain is projected off the relatum, and the referent is located in that search domain. In (2), for example, the referent *car* is located in a search domain projected off the relatum *house* on the basis of a cardinal directional system.

(2)   *The car is **north** of the house.*

In dynamic relations it is not a search domain that is projected off the relatum, but a path. The referent is moving along that path. Crucially, the referent and relatum may, but need not, be the same entity with the added dimension of time.

In (3a), for example, the referent *car* is moving along a path projected off the relatum *house*, in the same way that it is located in a search domain projected off the relatum in (2). However, in (3b) the referent and relatum are the same entity, the car, at different locations in time. The relatum is the car at time T. The referent is the car at time T^n. The referent *car* at T^n is moving along a path projected off the relatum *car* at T. As in (2), the path in both examples in (3) is projected off the relatum on the basis of the named direction *north*.

(3)   a.   *The car drove north from the house.*
         b.   *The car drove north.*

Static and dynamic relations are exemplified in Table 1.

Table 1. Static and dynamic relations

	relation	projection	relatum	referent
The car is north of the house.	static	search domain	*house*	*car*
The car drove north from the house.	dynamic	path	*house*	*car*
The car drove north.	dynamic	path	*car* at T	*car* at T^n

4.   Frame of Reference typology

Three FoRs have been proposed: *intrinsic*, *relative*, and *absolute*. These "exhaust the major types of [coordinate system] used in natural languages" (Levinson & Wilkins, 2006c, p. 4).[2] Each FoR represents a distinct strategy for projecting a search domain or a path off a relatum, and each has its own logical properties. Each operates by employing a different strategy to assign an asymmetry to a scene in order to project a search domain or path off a relatum.

4.1   Intrinsic FoR

The definition of intrinsic FoR adopted here is based on Levinson (1996, pp. 41–43). Intrinsic FoR operates by assigning an asymmetry to a scene by assigning a spatial asymmetry to the relatum itself. In (4) (repeating Example 1), the search domain is projected off the relatum on the basis of a perceived asymmetry assigned to the house itself – the house itself has a named facet *front*. The anchor point A is within relatum G.

(4)   *The car is **in front** of the house.*

Intrinsic FoR is a binary relation: An intrinsic spatial relation involves only two arguments, the referent F and the relatum G. (Henceforth I will refer to these two arguments together as the *referent-relatum dyad*.) In intrinsic FoR the FoR assigns an asymmetry to G. Anchor point A is conceptualized as an intrinsic facet of G. A search domain is projected off G on the basis of its facet A. In (4) G (*the house*) has an intrinsic facet *front*. A search domain is projected off that facet. To construct or interpret an intrinsic spatial reference it is necessary to know both the *location* and the *internal spatial structure* of the relatum. However, such a reference is not dependent on anything outside the referent-relatum dyad, hence its status as a binary relation.

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2.   Palmer (2003) proposes a fourth type, *unoriented* FoR, involving references such as *the cup is **by** the plate* or *the car is **near** the house*. Palmer proposes that in this FoR a search domain is projected off the relatum in an unoriented direction (in a practical sense, in all directions). This proposal will not be discussed further here. A different typology involving four FoRs is also proposed by Danziger (2010), who accepts absolute and relative FoRs largely as defined by Levinson (with the exception that she recognizes the ternary nature of absolute, see Section 5.1 below), but proposes dividing intrinsic FoR into two separate FoRs: "object centred" and "direct", depending on whether or not the Anchor/Ground is a speech-situation participant (Danziger, 2010, p. 172). Given that Danziger's proposal relates only to what is generally treated as intrinsic FoR, and does not bear on the status of absolute FoR, it is not discussed further here.

4.2   Relative FoR

The definition of relative FoR adopted here is based on Levinson (2003, pp. 43–47). Relative FoR operates by assigning an asymmetry to the scene in which the relatum occurs on the basis of a third participant, a viewpoint, *V*. In (5) the relatum *post* has no perceived intrinsic asymmetry. Instead, the search domain is projected off the relatum on the basis of an asymmetry given to the scene *by the presence of V*. Anchor point *A* is within *V* (actually, the location of *V*).

(5)   *The ball is **in front** of the post.*

Relative FoR involves a ternary relation. A relative spatial relation requires three arguments: referent *F*, relatum *G*, and viewpoint *V*. The FoR assigns an asymmetry to the scene. Anchor point *A* is the location of *V*. A search domain is projected off a facet of *G* assigned to it by *V*. In (5), *V* assigns to *G* (*the post*) a facet *front* facing *V*, and a search domain is projected off that facet towards *V*.

To construct or interpret a relative spatial reference it is not necessary to know anything about the internal spatial disposition of the relatum. Instead, it is necessary to know both the *location of the relatum* and the *location of the viewpoint*. It is necessary to invoke a third entity, the viewpoint, outside the referent-relatum dyad, hence relative FoR's status as a ternary relation.

4.3   Absolute FoR

Levinson's (2003) definitions of intrinsic and relative FoR are unproblematic and will not be discussed further here. The present paper argues that Levinson's (2003, pp. 47–50) definition of absolute FoR is problematic. The rest of the paper focuses on absolute FoR. In this section I first present Levinson's widely accepted definition.

For Levinson (2003, pp. 47–50), absolute FoR operates by assigning an asymmetry to the scene in which the relatum occurs on the basis of a system of *arbitrary fixed bearings*. No intrinsic asymmetry in the relatum is invoked, and the reference is independent of any viewpoint. According to Levinson, "[a]bsolute directions give us external bearings on an array, but without viewpoints …" (2003, p. 90). Absolute FoR involves "a system of coordinates anchored to fixed bearings" (2003, p. 48). This system of coordinates is a conceptual *Slope* (*S*). Slope is a system of fixed bearings imposed on a scene. A search domain is projected off the relatum on the basis of asymmetry given to the scene by *S*. Anchor point *A* is within Slope *S*. For Levinson, this makes absolute FoR a *binary* relation. He argues it involves only two arguments: referent *F*, and relatum *G*. Anchor point *A* is within *S*, and the search domain is projected off a facet of *G* assigned to it by *S*. In (6), for example, *S* assigns to *G* (*the house*) a facet *north*, and the search domain is projected off that facet.

(6)   *The car is **north** of the house.*

To construct or interpret an absolute spatial reference it is not necessary to know anything about the internal spatial disposition of the relatum. Instead, it is necessary to know both the *location of the relatum* and the *bearings of the Slope*. However, despite depending on invoking something outside the referent-relatum dyad (the Slope), Levinson regards absolute FoR as a binary relation.

4.4   Operationalizing each FoR

Each FoR is a strategy for projecting a search domain or path off a relatum by imposing an asymmetry on one member of the referent-relatum dyad, usually the relatum.[3] Projection of a search domain or path follows from that. The three FoRs differ from each other exactly in the strategy they employ to assign that asymmetry.

   With intrinsic FoR, as in (4), an asymmetry is assigned to the scene in the form of an asymmetry assigned to the relatum itself on the basis of the relatum's own perceived intrinsic characteristics. In (4) an asymmetry is assigned to the relatum *house* such that it is interpreted as having a distinct facet *front*. The search domain or path is then projected off the house on the basis of that facet.

   With relative FoR, as in (5), an asymmetry is assigned to the relatum by introducing a third argument external to the referent-relatum dyad, the viewpoint. This asymmetry takes the form of a facet towards the viewpoint, a facet away from the viewpoint, etc. In (5) an asymmetry is assigned to the relatum *post* by the presence of a viewpoint such that one facet of the post is interpreted as towards the viewpoint. The search domain or path is then projected off the post on the basis of that facet.

   With absolute FoR, as in (6), asymmetry is assigned to the relatum by introducing a component that is external to the referent-relatum dyad. In (6) this external component is a system of crossed cardinal axes *north-south* and *east-west*. This allows an asymmetry to be assigned to the relatum in the form of a facet towards the north, a facet towards the south, etc. In (6) an asymmetry is assigned to the relatum *house* on the basis of a north-south axis such that one facet of the house is interpreted as towards north. The search domain or path is then projected off the relatum on the basis of that facet.

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3.   The asymmetry is typically discussed as applying to the scene or array of objects. However, FoRs operate by projecting a search domain or path off one member of the referent-relatum dyad, usually the relatum, by assigning an asymmetry to that member of the dyad, not to the scene as a whole.

4.5   Diversity in absolute systems

A certain amount of cross-linguistic diversity is found with intrinsic FoR in terms of which objects can have an intrinsic asymmetry assigned to them, which facets are assigned the status of *front*, which the status of *back,* and so on. (see Levinson, 2003, pp. 76–84). In relative FoR different strategies exist for assigning a *front*, *back*, *left* and *right* to a relatum. These include systems of 'reflection', in which the relatum is treated as a mirror image of the viewer; systems of 'rotation', in which the relatum is treated as a person facing the viewer; and systems of 'translation', in which the relatum is treated as a person facing in the same direction as the viewer (Levinson, 2003, pp. 84–88). However, the degree of diversity in absolute systems is of a different order. Discussion of absolute FoR has traditionally invoked the cardinal directional system of a *north-south* axis crossing at right angles an *east-west* axis as the archetypal absolute system. However, many, probably most, absolute systems employ other axes. Some common systems include:

–   *North-south/east-west*. Examples: Arrernte (Australian, Central Australia; Wilkins, 2006, pp. 52–60); ‡Akhoe Haiǁom (Khoisan, Namibia; Widlok, 1997, 2008).
–   *Landward-seaward/parallel to coast*. Examples: Kokota (Oceanic, Solomon Islands; Palmer, 2002, pp. 135–137, 153–154, 2009, pp. 134–136); West Greenlandic (Eskimo-Aleut, Greenland; Fortescue, 1988, pp. 5–9, 2011, pp. 54–62).
–   *Upriver-downriver/away from river-towards river*. Examples: Jaminjung (Australian, Northern Australia; Hoffmann, 2011; Schultze-Berndt, 2006, pp. 103–107); Jahai (Mon Khmer, Malay Peninsular; Burenhult, 2005, p. 86, 2008b; Terrill & Burenhult, 2008, pp. 101–111).
–   *Uphill-downhill* (*elevational*)/*across on same level*. Example: Hmong (Mon-Khmer, Southeast Asia; Jaisser, 1995, pp. 174–181; Jarkey, 1991, pp. 42–44; Ratliff, 1990); Nimboran (Trans-New-Guinea, Papua New Guinea; Steinhauer, 1997).
–   *Uphill-downhill* (*fall of land*)/*across*. Example: Tenejapan Tzeltal (Mayan, Mexico; Brown & Levinson, 1993; Brown, 2006); Belhare (Sino-Tibetan, Nepal; Bickel, 1997, 2000).

Various other such systems exist.

5.   Re-examining absolute FoR

Foundational to Levinson's definition of absolute FoR are four principles that may be regarded as different faces of the same notion. These are that absolute FoR

involves bearings that are *abstract*, *arbitrary*, and *fixed*, and that absolute relations are *binary*, not ternary. In this section each of these will be re-examined.

5.1   Binary vs. ternary relations

Levinson's definition of absolute FoR treats it as a binary relation, involving the referent (Figure) and relatum (Ground) only, with the Slope not an argument of the relation. However, his definitions of each FoR as summarized in Section 4 actually set up a dichotomy between intrinsic on the one hand, with its clearly binary nature, and relative and absolute, with their dependence on something outside the referent-relatum dyad:

> "[I]n the intrinsic frame of reference the angles are found by naming a designated facet of a landmark or ground object … within the scene to be described."
>
> (Levinson & Wilkins, 2006c, p. 20)

However, in contrast:

> "In the case of relative and absolute frames of reference, the angular distinctions are mapped onto the scene from outside it, using the observer's own axes … in the relative frame, and fixed absolute bearings … in the absolute frame …" (*id.*)

Levinson and his collaborators observe that absolute FoR "uses information external to both the speech participants and the figure-ground scene" (Pederson et al., 1998, p. 572) However, they do not discuss the implications of this for a binary notion of absolute FoR.

   Despite explicitly defining absolute FoR as a binary relation (e.g. Levinson, 2003, pp. 50, 53), its dependence on something outside the referent-relatum dyad, suggested in the quotes above, is acknowledged elsewhere by Levinson as involving a ternary relation, and the dichotomy between intrinsic FoR on the one hand and relative and absolute FoR on the other is interpreted in terms of binary and ternary relations: "intrinsic is based on a simple binary relation between figure and ground (unlike the other two frames of reference, which involve ternary relations between figure, ground and viewer or fixed bearing)" (Levinson & Wilkins, 2006b, p. 542). As Danziger (2010, p. 169) puts it, absolute FoR is a ternary relation because "the Anchor is located in the landscape or the cosmology surrounding the Figure-Ground scene". I will return to the issue of absolute FoR as a ternary relation below.

5.2   Fixedness

According to Levinson (2003, p. 48), absolute FoR works "by fixing arbitrary fixed bearings, 'cardinal directions', corresponding one way or another to directions or arcs that can be related by the analyst to compass bearings." Levinson & Wilkins say that absolute FoR involves "fixed bearings – independent of the scene […] the

names and directions of the fixed bearings are fixed once and for all" (2006c, p. 4). However, what does it mean to say directions are *fixed*? Is fixedness a principled definitional requirement for absolute FoR? Further, is it a requirement that the axes involved are relatable to cardinal directions?

5.3 Radial and curved axes

In many languages, axes operating in absolute FoR do not consistently correspond to cardinal directions, but still retain consistent directional reference within their own conceptual system. For example, Manam (Oceanic, Papua New Guinea; Lichtenberk, 1983, pp. 569–584) has a directional system involving a pair of axes that cross each other at right angles. Manam is spoken on a volcanic island of the same name that has an almost perfectly round shape. The language has two lexified axes that operate in absolute FoR. One is a landward-seaward axis that crosses the land-sea boundary at right angles. Movement from the interior of the island towards the coast, across the land-sea boundary, and away from the shore at sea is expressed as *oro*; the opposite direction is *oti*. This axis is crossed by an axis that runs parallel to the coast, either in the interior, on the coast itself, or at sea. Movement in each direction on this axis is expressed as *raʔe* or *bala*. Systems such as this are typical for island-based languages (see e.g. Palmer, 2002; François, 2004). However, because Manam island is round, the *oro-oti* axis radiates out from the centre of the island like spokes of a wheel, while the *raʔe-bala* axis curves around the island. The term *raʔe* denotes movement clockwise around the island, i.e. to the right if facing the sea from land; *bala* denotes movement anticlockwise around the island, i.e. to the left if facing the sea. Directions on each axis are expressed by a set of directional nouns, demonstratives, verbs indicating motion in each direction, and directional verbal suffixes, as presented in Table 2.

Table 2. Manam directional terms

noun			demonstrative		verb	suffix	
auta	'landward'	*eta*	'over there landward'		*oro*	*-oro*	'move landward'
ilau	'seaward'	*elau*	'over there seaward'		*oti*	*-oti*	'move seaward'
ata	'clockwise'	*ene*	'over there clockwise or anticlockwise'		*raʔe*	*-raʔe*	'move clockwise', 'ascend'[4]
awa	'anti-clockwise'				*bala*	*-ria*	'move anticlockwise', 'descend'

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4. Note that motion verbs relating to the clockwise-anticlockwise axis also lexify directions on the vertical axis.

To what extent can directions in this system be regarded as fixed? Manam directions cannot be consistently related to Western cardinal directions, since their corresponding cardinal bearings depend on the location on the island where the spatial relation or movement is located. For example, movement *oro* 'landward' corresponds to southward movement in the northern part of the island, but to northward movement in the southern part of the island, to movement east on the west coast, and so on. When viewed from the perspective of Western cardinal directions, *oro* can denote any direction, and would therefore not be fixed. However, *oro* does not operate in the Western cardinal conceptual system. When viewed from within the conceptual system within which it operates, *oro* always consistently denotes a single direction: landward. From the perspective of the Manam conceptual system, it is English cardinal directions such as *north* that are not fixed. On the east coast *north* points *bala*, on the north coast it points *oti*, on the south coast it points *oro*, etc. English *north* therefore can denote any direction. Manam directions can only be seen as not fixed if we privilege the English cardinal system over all others.

Thus far we have assumed that the Manam system described above operates in absolute FoR. This is justified, as the construction of spatial reference in this system is operationally identical to the construction of spatial reference involving uncontroversially absolute systems such as the cardinal system. The English reference in (7a) may be operationalized as follows. The location of the referent (*the child*) is identified by assigning an asymmetry to the scene in order that a search domain can be projected off the relatum (the speaker). The search domain is not projected off the relatum on the basis of an internal asymmetry assigned to the speaker him or herself, so is not intrinsic FoR. It is also not projected off the speaker on the basis of a viewpoint, so is not relative FoR. Instead, it is projected off the relatum by assigning a northern facet to the relatum on the basis of an anchoring phenomenon that is external to the referent-relatum dyad – an absolute north-south axis.

(7)   a.   *The child is north of me.*

      b.   *natu maʔara ilau   i-soaʔi*
           child there   seaward 3SG.RL-be.located
           'The child is there seaward [from me].' (Lichtenberk, 1983, p. 576)

The Manam reference in (7b) operates in an identical way to that in (7a). The location of the referent child is identified by assigning an asymmetry to the scene in order to project a search domain off the relatum speaker. The search domain is not projected off the relatum speaker on the basis of an internal asymmetry assigned to the speaker him or herself (so it is not intrinsic FoR), or on the basis of a viewpoint (so it is not relative FoR). Instead, the search domain is projected off the

relatum by assigning a seaward facet to the relatum on the basis of an anchoring phenomenon external to the referent-relatum dyad – a landward-seaward axis.

Operationally there is no difference between the English cardinal system and the Manam island-based system. If the former is regarded as operating in absolute FoR, there is no principled reason for not regarding the Manam system in the same way.

5.4   Unpredictable bearings

Manam absolute directions are fixed in the sense that they apply in an invariant and consistent manner to any location in the language locus (see Palmer, 2005, pp. 5–6; Terrill & Burenhult, 2008, p. 123). Many languages have absolute directions that are fixed in the Manam sense. However, even this is not a necessary operational requirement of absolute FoR. Absolute directions need not depend on a predictable conventionalized bearing (Palmer, 2003). One type of example of this involves axes associated with wind direction, such as English *windward* vs. *leeward* and *upwind* vs. *downwind*.

(8)   a.   [*T*]*he ship is placed to windward of the man before the boat is lowered*.[5]

   b.   *Make sure you wait downwind from where the wild pigs are expected to appear*.[6]

Examples such as those in (8) operate in absolute FoR. They refer to bearings on a scene that are external to the referent-relatum dyad, without invoking a viewpoint. In (8a), for example, the referent (*the ship*) is located in a search domain projected off the relatum (*the man*). It is not projected off the man on the basis of an internal asymmetry assigned to the man himself (so it is not intrinsic FoR), nor on the basis of a viewpoint (so it is not relative FoR). Instead, the search domain is projected off the man on the basis of an anchoring phenomenon external to the referent-relatum dyad in the external world – the wind direction in a particular location at a particular time. Likewise, in (8b) the referent (*you*) is located in a search domain projected off the relatum (*the pigs' position*), not on the basis of an internal asymmetry assigned to the pigs' position (so not intrinsic FoR), nor on the basis of a viewpoint (so not relative FoR), but on the basis of the same external world anchoring phenomenon of wind direction in a particular location at a particular time. In both examples, the bearing in which the search domain will be projected is not only not fixed in terms of Western cardinal directions, but is not

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5.   Viewed at: www.bruzelius.info/Nautica/Seamanship/Alston(1860)_s358.html.

6.   Viewed at: www.jesseshuntingpage.com/site/hog.html#TopOfDoc.

predictable, since it depends on the actual direction in which the wind happens to be blowing at a particular location at a particular moment in time. Indeed, the bearing referred to in each example in (8) is unknowable from the context of the examples alone, as they are instructions relating to hypothetical events involving a hypothetical relatum in a hypothetical location. Spatial references such those in (8) are operationally identical to those involving cardinal bearings such as *north*, yet there can be no question of the bearings referred to by these directional terms being fixed, even in the Manam sense.

5.5   Abstractness and arbitrariness

In Levinson's view, absolute FoR definitionally involves bearings that are arbitrary as well as fixed (2003, p. 48). It is necessary for Levinson's definition of absolute that such systems involve arbitrary axes, as they are definitionally required to be abstract. Absolute FoR

> […] requires consensus in the community about named, fixed directions … it matters not at all what directions are fixed and named, only that members of a community can consistently find and name them.
>
> <div align="right">(Levinson & Wilkins, 2006b, p. 541)</div>

Such systems

> […] fix the directions once and for all […] It matters not at all where the angles or directions are fixed, just so long as everyone in the community adopts the same solution […] an absolute, arbitrary fixed direction is necessarily a social artefact […] A child must learn whatever the local system is and treat it as an arbitrary invariant […]   (Levinson, 1998, p. 13)

It is not made explicit precisely what the term *arbitrary* is intended to mean here. It could be taken to mean that the choice of the specific absolute system employed by a community (cardinal compass points, upriver-downriver, landward-seaward etc.) is arbitrary. However, it is surely implausible that any randomly chosen system could be adopted by a community and transferred across generations. It is, for example, unlikely in the extreme that residents of a broad continental plain or desert would adopt an uphill-downhill or landward-seaward system, or that such a system could be acquired by children in that environment. More plausibly, an island-based community might choose to employ either a compass cardinal system or a landward-seaward system. However, even in such cases there is evidence that the system used by a community is not arbitrary: a correspondence typically exists between the absolute system employed and the topography of the language locus. I return to this evidence in Section 9.

It could be argued that FoR preference itself might be arbitrary – that an island community might exhibit a preference for absolute FoR involving landward-seaward or for relative FoR involving left and right. However, again there is growing evidence of a correlation: urban environments tend to be associated with relative FoR, while rural environments tend to be associated with absolute FoR (Majid, Bowerman, Kita, Haun, & Levinson, 2004, p. 111; Burenhult & Levinson, 2008, p. 136). This tendency even surfaces within different varieties of a single language. Pederson (1993, pp. 429–434) has shown that rural Tamils use absolute FoR, while urban Tamils employ relative FoR (see Section 9 below).

Alternatively, arbitrariness could be interpreted as meaning that directions in absolute systems are arbitrary in an operational sense. Again this does not appear to be the case. The direction indicated by Manam *oro*, for example, is determined by the actual location of the sea in relation to the relatum. The direction indicated by *downwind* is determined by the actual wind direction in a particular location at a particular time. The wind direction axes discussed in Section 5.4 cannot be arbitrarily abstracted from actual unforeseeable wind directions. They would not be operationable if they were. Even apparently abstract directions such as *north* depend on the speaker maintaining their orientation on the basis of cues in the external world. The role of the external world appears central in the operation of absolute systems. Indeed, the very notion of Slope as an inherent property crucial to Levinson's definition of absolute FoR (see Section 4.3) implicitly introduces an anchoring of absolute spatial references in the external world, and a covert admission of the ternary nature of absolute references.

5.6 The external world in absolute FoR

Despite the dominant view that absolute systems are arbitrary and abstract, acknowledgement of the role of the external world in anchoring absolute directions is pervasive in the literature.

> Absolute coordinates can be based on many different sources – solar compass, sidereal motion, wind direction, river drainage, mountain slopes … For example, the Tenejapan Tzeltal system is transparently based on mountain slope, and the Jaminjung system on river drainage. (Levinson & Wilkins, 2006c, p. 22)

Even with systems less transparently connected to the environment, it is assumed that the environment plays a crucial role in the coordinate system.

> More abstract systems, as exemplified by Arrernte … are probably based on a fusion of cues, e.g. solar compass and prevailing winds.
>
> (Levinson & Wilkins, 2006c, p. 22)

Other systems, such as of the Jaminjung riverine system (see Section 9.3 below), "are more directly linked to ecological cues" (Levinson & Wilkins, 2006b, p. 541). Absolute systems require that speakers

> […] maintain their orientation with respect to the fixed bearings at all times … [To do this] we may presume that a heightened sense of inertial navigation is regularly cross-checked with many environmental cues.   (Levinson, 2003, p. 48)

However,

> […] none of these environmental gradients can provide the cognitive basis of abstracted systems. Once the community has fixed a direction, it remains that direction regardless of fluctuations in local landfall, drainage, wind source, equinox, and so on …   (Levinson, 1996, p. 163)

However, this fixedness of directions in absolute systems is valid only if many coordinate systems, or in some cases just certain subparts of some coordinate systems, are excluded simply by failing to satisfy a definitional requirement that they be fixed and abstract, a stipulative and circular basis for understanding absolute FoR. The Manam and Jaminjung systems, for example, do not conform to this, despite being regarded in the literature as absolute, as they are not fixed in this sense. The same is true of the English *upwind-downwind* and *windward-leeward* axes, which do not conform to that definitional requirement. However, all are operationally identical to uncontroversial absolute axes like *north-south*.

Some systems appear to conform to Levinson's stipulation in one context but not in another. One ambiguity claimed by Levison in absolute systems lies

> […] where the system is abstracted out of landscape features, the relevant expressions (e.g. 'uphill'…) may refer to places indicated by relevant local features (e.g. local hill …) or to the abstracted fixed bearings, where these do not coincide.
>   (Levinson, 2003, p. 49)

Tenejapan Tzeltal, for example, has an uphill-downhill axis in which *ajk'ol* 'uphill' indicates a direction towards the highlands in the south of the language territory, and *alan* 'downhill' indicates a direction towards the lowlands in the north (Brown, 2006, pp. 263–270; Levinson, 2003, pp. 148–149). If a ridge rises towards the lowlands, ascending that ridge is still going 'downhill', in the sense of the abstracted uphill-downhill axis, yet the same trajectory can simultaneously be 'uphill' in the sense of this local topographic feature.

However, the ambiguity here does not demonstrate a conceptual distinction between a local landmark reading and abstract fixed reading. Instead, the distinction depends on scale. A location further up the slope of a ridge in the general direction of the lowlands is literally uphill if thought of in terms of the immediate ridge, and simultaneously literally downhill if thought of in terms of the overall fall

of land across the entire territory. In both contexts the conceptual basis of the axis is the same – only the scale to which it is applied differs.

A similar situation applies in Makian Taba (Austronesian, Halmahera, Indonesia; Bowden, 1997, 2001, pp. 277–291; Palmer, 2002, p. 148). Taba is spoken on Makian, a small round island resembling Manam, and has a directional system that closely resembles that of Manam. It has a landward-seaward axis expressed by forms including the directionals *akle* 'landward' and *akla* 'seaward', and a cross axis parallel to the coast (in the interior, on the coast or at sea), expressed by forms including the directionals *appo* 'clockwise' and *attia* 'anticlockwise'.[7] On Makian island this system operates in the same way as Manam on Manam island. However, Taba is also spoken on mainland Halmahera, lying to the east of Makian across a strait about 20kms wide. In an apparent paradox, movement across the strait away from Makian towards Halmahera may be expressed as either 'landward' or 'seaward', movement north along the strait may be expressed as 'clockwise' or 'anticlockwise', and so on. The reason for this superficial paradox relates to the geographic domain within which the spatial relation is conceptualized. If speakers are thinking of the movement in relation to Makian island, then a bearing away from Makian towards Halmahera is literally *akla* 'seaward'. If they are thinking of the movement in relation to Halmahera, that same bearing is literally *akle* 'landward'. If northward movement along the strait with Makian to the left and Halmahera to the right is thought of in relation to Makian, it is literally *attia* 'anticlockwise', but if thought of in relation to Halmahera it is literally *appo* 'clockwise'. This is supported by the fact that the direction expressed by *attia* 'anticlockwise' in relation to Halmahera (i.e. south when in the strait) does not continue south once the southern tip of Halmahera is reached, but curves around the south western peninsula of Halmahera in a predictable way. Rather than multiple conceptual systems operating, Taba has a single conceptual system similar to that of Manam, which may be superimposed on Makian or on Halmahera as required.

5.7   Ad hoc references

The lack of necessary abstraction in absolute systems is clear in truly *ad hoc* non-conventionalized references that nevertheless invoke absolute FoR. In English these are productively generated morphologically using the suffix *-ward* (Palmer, 2004, pp. 7–8).

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7.   As in Manam, the terms for 'clockwise' and 'anticlockwise' also lexify 'downwards' and 'upwards' on the vertical axis.

(9)   a.   *his barefoot trail led* **schoolward** *from the little farm.*[8]

     b.   *the North Atlantic Cold Storage wharf, a stone's throw* **beachward** *from our house.*[9]

     c.   *Wilson, lazily wandering* **storeward** *from the boarding house after dinner, seated himself upon a box.*[10]

Ad hoc references such as those in (9) operate in absolute FoR. They involve a strategy for projecting a search domain or path off a relatum, and do so by imposing external bearings on an array, without a viewpoint. In (9b), for example, the referent (*the wharf*) is located in a search domain projected off the relatum (*our house*), not on the basis of an internal asymmetry of the house itself (so not intrinsic), or a viewpoint (so not relative), but on the basis of an anchoring phenomenon in the external world (the location of the beach).

    The central morphological function of English -*ward* is to productively generate spatial adverbs expressing *ad hoc* absolute spatial relations, marking the suffixed noun as the third participant in a ternary spatial relationship. Being *ad hoc*, these relations inherently cannot be fixed. This means that they are inherently non-arbitrary and non-abstract, yet operate in absolute FoR.

6.   Landmarks

Before continuing it is worth considering whether the systems treated as absolute above do not in fact involve absolute FoR, but represent the use of landmarks.

> [S]ome languages use conventionalized landmark systems that in practice grade into absolute systems, although there are reasons for thinking that landmark systems and fixed bearings [i.e. absolute] systems are distinct conceptual types.
> (Levinson, 1996, p. 161)

The distinction between conventionalized landmark systems and absolute FoR is not explicitly expressed in the literature. As Terrill & Burenhult observe, this is a murky area, because landmarks "challenge categorization based on concrete vs. abstract and ad hoc vs. conventionalized spatial cues" (2008, p. 122). The degree of concreteness and conventionalization of landmarks varies across languages.

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8.   Viewed at www.rootsweb.com/~mahampde/commerce/05.html.

9.   Viewed at www.upne.com/features/gasparex.html.

10.   Viewed at www.archive.org/stream/barbaraofsnows00greeuoft/barbaraofsnows00greeuoft_djvu.txt.

In some they form "vectors which abstract away from actual geography, while in other languages this is not the case at all" (Terrill & Burenhult, 2008, p. 122).

For Levinson, landmarks and absolute FoR are distinct because landmarks do not conform to a definition of absolute FoR in which absolute axes must be fixed, arbitrary and abstract.

> Absolute directions give us external bearings on an array, but without viewpoints […] Local landmarks can give us some of the same properties […] but do not have the same abstract properties as notions like 'north'.   (Levinson, 2003, p. 90)

The problem lies in the nature of Levinson's definition of absolute FoR (see, for example, Terrill & Burenhult, 2008, pp. 123–124). If a definition is a statement of an ideal or prototype, then landmark systems may be too far from the ideal or prototype to count as absolute. This is why Levinson (1996, p. 161) believes that landmark systems "grade into" absolute systems. However, if this is true, there can be no principled distinction between absolute FoR and landmark systems, in which case a definition of absolute FoR that includes some systems that invoke features of the environment, but excludes others, does so by fiat and is unmotivated. The murkiness relating to landmarks arises because observable phenomena challenge Levinson's established definition: referential systems that are operationally identical to uncontroversial absolute systems, but which cannot be analysed in terms of arbitrary abstractions. If the definition of absolute FoR is challenged by landmark systems, the problem lies not with the observable phenomenon, but with the definition.

So, what principled basis, if any, exists for distinguishing between landmarks and absolute FoR? No attempt has been made to operationalize the distinction between absolute FoR and landmarks (Terrill & Burenhult, 2008, p. 124). I propose a two-pronged basis for doing this. First, there is a *grammatical* distinction between expressions of landmarks and expressions in absolute FoR. Second, there is an *operational* distinction between references based on landmarks versus references based on absolute FoR.

Grammatical and operational distinctions between landmark systems and absolute systems can be illustrated by comparing the English terms *east* and *landward*.

East is uncontroversially regarded as absolute. *Landward* could be regarded as too far from an ideal absolute direction to conform to the definitional requirement that absolute directions be abstract, arbitrary, and fixed – it is whatever direction in which land happens to be. *Landward* could also be construed as invoking a landmark, i.e. 'in the direction of land'.

Grammatically a distinction can be drawn in English between nouns expressing entities that may refer to places in a spatial expression and forms constituting members of spatial referential systems, such as directional adverbs.

Spatial relations may be expressed using NPs referring to landmarks within a PP expressing a goal, source or location, as in (10), and potentially any NP could function in this way. Alternatively, spatial relations may be expressed by directional adverbs, as in (11).

(10)   a.   *The yacht sailed **towards the land***.
       b.   *The yacht sailed **towards the open ocean***.
       c.   *The yacht sailed **towards Sydney***.
       d.   *The yacht sailed **towards the treacherous uncharted reef***.

(11)   a.   *The yacht sailed **landward***.
       b.   *The yacht sailed **seaward***.
       c.   ?*The yacht sailed **Sydneyward***.
       d.   **The yacht sailed **treacherous uncharted reefward***.

The locations invoked in (10) do not form part of a grammaticized coordinate system imposing an asymmetry on the scene, so do not invoke a FoR. These are landmarks, and any NP referring to a physical object could comprise a goal, source or location in this way. However, the directional adverbs in (11a–b) do form part of a grammaticized and restricted coordinate system imposing an asymmetry on a scene in order to project a path or search domain off a relatum. The derived adverb in (11c), if acceptable, imposes an asymmetry in a similar way. The more complex phrasal reference in (11d) is unacceptable because the reference involves a NP, rather than a direction adverb participating in an absolute referential system. The references in (11a–b) and, if acceptable (11c), are operationally identical to uncontroversially absolute references. Consider the dynamic and static relations expressed by landward in (12).

(12)   a.   *The yacht sailed **landward***.
       b.   *The yacht is anchored **landward** of the freighter*.

In the second of these examples, a path or search domain is projected off the relatum *freighter*, not on the basis of internal asymmetry assigned to the freighter itself (so it is not intrinsic FoR), or a viewpoint (so it is not relative FoR), but on the basis of an anchoring phenomenon in the wider world (the location of land). This must involve a FoR, as it is a coordinate system whose function is to impose an asymmetry on a scene in order for a path or search domain to be projected off a relatum. It does not operate in intrinsic or relative FoR. Recall that Levinson regards intrinsic, relative and absolute FoRs as having exhaustive coverage, and that he defines absolute FoR as giving "external bearings on an array, but without employing viewpoints" (Levinson, 2003, p. 90). On this basis, references such as those in (12) must involve absolute FoR. Note also that *landward* clearly expresses a ternary relation: the path or search domain is projected off the relatum *freighter*

on the basis of a participant outside the referent/relatum dyad, namely the location of land.

Now consider *east*(*ward*) in (13). Grammatically, *east*(*ward*) behaves in the same way as *landward*: as a directional adverb in a spatial referential system.

(13)   a.   *The yacht sailed **east/eastward**.*
       b.   *The yacht is anchored **east** of the freighter.*

Operationally *east*(*ward*) forms part of a coordinate system which imposes an asymmetry on a scene, so a path or search domain can be projected off the relatum. A path or search domain is projected off the relatum *freighter* on the basis of an anchoring phenomenon in the wider world (whatever observable environmental cues motivate and anchor the east-west axis). *East*(*ward*) and *landward* behave grammatically and operationally in the same way in a FoR that is neither intrinsic nor relative. If we regard this FoR as absolute for *east*(*ward*), then we must regard it as absolute for *landward*.

Note also that *east* can also occur as the head of an NP referring to the goal of verbs of movement or change of location. Compare (14) with (10).

(14)   a.   *The yacht sailed towards the east.*
       b.   *The yacht sailed towards the land.*
       c.   *The yacht sailed towards the treacherous uncharted reef.*

Under the definition of 'landmark' adopted here, if *the land* is a landmark, *the east* must also be a landmark. Cardinal terms such as *east* may operate as a landmark, or as part of a coordinate system operating within absolute FoR, in exactly the same way as *land*.

Not only are cardinal terms such as *east* not necessarily operating within a directional system in any FoR, as (14a) exemplifies, but the degree of abstractness of notions such as *east*, even in the directional system, may be overstated. As discussed in Section 5.6, even with supposedly fully abstract notions such as *east*, speakers depend on environmental cues such as the path of the sun and/or prevailing wind direction when employing such terms. It may be that the extent to which such 'abstract' terms depend on concrete associations is greater than has been previously assumed. Anecdotal evidence from English speakers suggests concrete anchoring associations for cardinal terms in familiar locations. English speakers from Calgary, Canada, for example, report that *west* is anchored as the direction towards the highly visible and salient mountains, while *east* is the direction away from the mountains. For residents of Calgary in that location, *west* therefore effectively means 'mountainward', while *east* means the opposite direction. Such speakers report that *north* and *south*, which are not anchored in any salient observable phenomenon, are used less confidently, with speakers

reporting less certainty about which cross direction is which. For Calgary speakers in situ, the *north-south* axis may be interpreted as a derived cross axis, derived from a primary *mountainward-away-from-mountain* axis lexified by *west* and *east* respectively.

A similar situation pertains in Lavukaleve (Papuan, Solomon Islands; Terrill, 2003; Terrill & Burenhult, 2008). As with many other island-based systems (see e.g. François, 2004; Palmer, 2002), Lavukaleve has a landward-seaward system used on land and in immediate offshore waters, while for wider scale references beyond the immediate island, a system that corresponds more directly to cardinal directions applies (Terrill & Burenhult, 2008, pp. 112–114). The landward-seaward system has dedicated directional verbs relating to movement towards land from on the water or inland from the shore, and for movement from the hinterland towards the shore and away from land on water. The cross axis in Lavukaleve is an undifferentiated transverse (see Palmer, 2002, p. 127)[11] in which both directions are expressed by the lexeme *ve* 'go'. The cardinal system used in the wider scale has an axis that corresponds roughly to English *east-west*, again lexified by motion verbs, but tellingly, with motion verbs the cross axis here (corresponding roughly to *north-south*) is also an undifferentiated transverse, again lexified by *ve*. The cardinal system may also be expressed by locational nouns (Terrill, 2003, pp. 101–102), in which all four directions including north and south are separately lexified. In experiments involving the man and tree game, one of the stimulus materials developed by the *Max Planck Institute for Psycholinguistics*, Terrill and Burenhult found very variable use of the cardinal terms. This finding

> […] suggests, rather, that for most speakers each of the terms exists separately, not necessarily in opposition to its counterpart, or to the terms forming the other axis. This suggests in turn that the terms do not represent abstracted axes at all, but rather are alternative names for generalized directions, possibly based on landmarks.   (Terrill & Burenhult, 2008, p. 124)

> Knowing the direction of one compass point does not automatically enable a speaker to work out where the other compass points are. It seems, rather, that they are known singly in relation to obvious landmarks … They are less concrete than expressions such as 'mountain', but they are nonetheless tied to concrete landmarks.   (Terrill & Burenhult, 2008, p. 125)

Terrill and Burenhult conclude that the Lavukaleve cardinal terms can be best seen as a type of landmark. Indeed, the locational nouns belong to a small subclass of nouns, but may nonetheless express landmarks in the sense discussed above. This,

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11.   Palmer (2002) uses the term *traverse* for what is more properly *transverse*.

however, does not undermine the significance of their observations about the conceptual independence of each cardinal direction or location.

7. Three case studies

7.1 Balinese

Spatial reference in Balinese (Wassmann & Dasen, 1998) is an illuminating illustration of the distinction between absolute FoR and reference to landmarks drawn in Section 6. Pederson regards the Balinese system as "an intermediate case between local landmarks and an absolute coordinate system" (Pederson, 2003, Footnote 2). For Levinson, Balinese exemplifies systems that

> [...] may employ true abstracted cardinal directions on one axis, but landmark designations on the other [...] one axis is determined by monsoons, and is a fixed, abstracted axis, but the other is determined by the location of the central mountain.   (Levinson, 2003, p. 49)

Note, however, that even here the 'abstracted' axis is explicitly stated to be motivated ("determined") by an external phenomenon – the monsoon. Balinese has a four term system of spatial reference lexifying polar directions on two axes:

(15) a. *kaja-kelod*   'mountainward-seaward'
      b. *kangin-kauh* 'east-west'

For Indrawati (1993), a native speaker, these indicate the directions in (16).

(16) a. *kaja*   'the direction of the mountain'
      b. *kelod*   'the direction of the sea'
      c. *kangin* 'the direction of sunrise'
      d. *kauh*   'the direction of sunset'

Note that *kangin* 'east' is motivated by the east-west direction of the monsoons according to Levinson (2003, p. 49), and to the location of sunrise according to Wassmann & Dasen (1998, p. 692) and Indrawati (1993). As these two external phenomena coincide in this location, it is likely both play a role.

Bali has a high mountain range running east-west across the island. Most Balinese live to the north or the south of this range, so the *kaja-kelod* and *kangin-kauh* axes cross orthogonally for most speakers – with *kaja* corresponding to 'north' in southern Bali and 'south' in northern Bali (Arka, 2006; Wassmann & Dasen, 1998, p. 692). However, at the eastern tip of the island this neat coincidence of crossing directions cannot apply. In this case, the external motivation for each becomes more strikingly apparent. The direction indicated by *kaja* depends on the

location of the largest visible mountain, and *kelod* indicates a direction towards the sea if visible, even if this is not at a 180° angle from the direction indicated by *kaja*, with commensurate adjustments of the east-west axis (see Wassmann & Dasen, 1998, pp. 697–700). These terms therefore show the same kind of independence as seen in Lavukaleve.[12]

Grammatically, the directional terms in (16) can function as nouns expressing landmarks, as in (17a–b), in the same way as topographic terms such as *gunung* 'mountain' in (17c), which is unambiguously a common noun. However, only the terms in (16) also function as verbs, as in (18) (where they appear with the initial consonant nasal mutation marking actor voice). Hence the ungrammaticality of (18c). The terms in (16) can therefore be seen to form a distinct grammatical class of directional terms.[13]

(17) a. *Nto kaja*.
          that mountainward
          'That's the inland.'

      b. *Nto kangin*.
          that east
          'That's the east.'

      c. *Nto gunung*.
          that mountain
          'That's a mountain'

(18) a. *Nyoman ngaja-n-an*.
          N.   AV.mountainward-LIG-LOC
          'Nyoman is going inland.'

      b. *Nyoman ngangin-an*.
          N.   AV.east-LOC
          'Nyoman is going eastwards.'

      c. **Nyoman ngunung-an*.
           N.   AV.mountain-LOC
          'Nyoman is going mountainwards.'

Operationally the verbs in (18a–b) project a path off the relatum (*Nyoman* at time *T*) on the basis of an anchoring phenomenon in the wider world: the

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largest visible mountain in the case of *kaja*, the sea in the case of *kelod*, the location of sunrise in the case of *kangin*, and the location of sunset in *kauh*. The 'mountainward-seaward' terms and 'east-west' terms behave in the same way as each other operationally and grammatically, and are explicitly anchored in external world phenomena for speakers. There are therefore no grounds for regarding them as distinct along the lines of Levinson's characterization of 'east' and 'west' as inherently absolute, and 'mountainward' and 'seaward' as referring to landmarks.

7.2   *Upsun* and *downsun*

East is motivated by and anchored in the *path* of the sun, but it may be conventionalized. The *location* of the sun may also motivate and anchor spatial references where no other suitable phenomenon is available, or the location of the sun is relevant to the purpose of the reference. In some specialized domains in English, including aviation and space exploration, spatial relationships are expressed with reference to the location of the sun using an axis lexified as *upsun-downsun*. This resembles concepts such as *upwind-downwind*.

(19) a.   *I had spotted 22 ME-109s and couldn't let them see me. I kept **up-sun** from them with my squadron of sixteen P-51s. Finally, when they leveled out and headed over towards the bombers, I just moved in behind them, **down-sun**. I got within two hundred yards behind them.*[14]

　　 b.   *I flew straight **downsun** just after dawn …*[15]

The *upsun-downsun* axis invokes a coordinate system, not a landmark. The terms are adverbs expressing vectors, not nouns expressing goals, sources or locations:

(20) a.   *I kept **up-sun** from the ME-109s.*　　　　coordinate system
　　 b.   *I kept between **the sun** and the ME-109s.*   landmark

Upsun-downsun operates in absolute FoR. It gives external bearings on an array, without a viewpoint. In (20a) the referent (*the speaker*) is located in a search domain projected off the relatum (*the ME-109s*), not on the basis of an internal asymmetry of the ME-109s themselves (so not intrinsic), or a viewpoint (so not relative), but on the basis of an anchoring phenomenon in the external world (the location of the sun). In Levinson's terms, Slope *S* (in this case the *upsun-downsun* axis) assigns a facet *upsun* to relatum *G* (*the ME-109s*). A search domain is projected off that facet.

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14.   Viewed at www.achievement.org/autodoc/page/yea0int-2.

15.   Viewed at www.bethwaite.com/10264,02,2-0-automatic-rig–-part-2.html.

The *upsun-downsun* axis invokes a coordinate system that operates within absolute FoR, but lacks several of Levinson's definitional properties:

–   It is not fixed in Levinson's (2003) sense, but is fixed in the Manam sense (Palmer, 2002).
–   It is concrete, not abstract.
–   It is not arbitrary.
–   It is ternary not binary.

Upsun-downsun therefore provides evidence supporting the notion of absolute proposed here.

7.3   The ship as an external world

Upsun-downsun operates in a very large domain, for practical purposes unbounded. The external worlds in which absolute FoR can operate can be bounded and very much smaller.

A maritime vessel comprises a small bounded domain with named boundaries. The named boundaries are toponyms that can function as landmarks. In English each corresponds to a spatial adverb that operates in intrinsic FoR. Each also corresponds to a spatial adverb that operates in absolute FoR (Palmer, 2003), as in Table 3.

Table 3. Maritime vessel terms

toponym	intrinsic	absolute
bow	*ahead/forward*	*forward*
stern	*astern*	*astern/aft*
portside	*port(side)*	*port(side)*
starboard side	*starboard*	*starboard*

The toponyms may function as landmarks in the same way as any other noun, as the head of an NP within a PP expressing a goal, source or location in the manner discussed in Section 6, as exemplified in (21).

(21)   a.   *everyone was asked to move **to the bow** of the boat*[16]
       b.   *Because of the tremendous weight of the three large propellers **in the stern** of the ship, the stresses in the ship's midsection increased immensely* […][17]
       c.   *the baggage doors **on the portside** of the ship are re-opened*[18]

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16.   Viewed at http://www.waterski.about.com/od/glossaryofterms/g/bldef_bow.htm.

17.   Viewed at http://www.writing.engr.psu.edu/uer/bassett.html.

18.   Viewed at http://www.sterling.rmplc.co.uk/visions/rdeckexplanation.html.

When the vessel is functioning as the relatum in a spatial reference, intrinsic FoR may be employed, in which a search domain or path is projected off whichever facet of the ship is referred to, as in (22).

(22) a. *The lookouts in the crow's nest sighted an iceberg immediately ahead of the ship.*[19]

   b. *Crew on the deck then reported a u-boat astern of the ship.*[20]

   c. *Hassayampa is one of ships portside of battleship USS Iowa.*[21]

The examples in (22) operate in intrinsic FoR. In (22b), for example, the referent (*a u-boat*) is located in a search domain projected off the relatum (*the ship*) on the basis of the perceived asymmetry of the ship. It is projected off an intrinsic facet of the ship – its stern.

However, when the referent and relatum are both located within the confines of the boundaries of a vessel, the vessel itself becomes the external world in which the dyad is located. Absolute references may be constructed using the boundaries of the vessel as the basis on which an asymmetry is assigned to the relatum, as illustrated in (23). To use Levinson's term, the vessel as a whole becomes the Slope.

(23) a. *the remaining ones were stowed within a small area amidships just **forward** of the stone-boulder ballast*[22]

   b. *The engine hatch is mounted immediately **astern** of the cabin*[23]

   c. *The 'L' shaped galley, positioned aft **portside** of the main saloon, is impeccably presented*[24]

The examples in (23) operate in absolute FoR. They give external bearings on an array, without a viewpoint. In (23a) the referent (*the remaining ones*) is located in a search domain projected off the relatum (*the stone-boulder ballast*). This search domain is not projected off the relatum on the basis of an asymmetry of the relatum itself (the ballast cannot be construed as itself having an intrinsic forward facet). Instead a forward facet is assigned to the ballast on the basis of an anchoring phenomenon in the external world (the location of the bow). In Levinson's

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19. Viewed at http://www.tms.org/pubs/journals/jom/9801/felkins-9801.html.

20. Viewed at http://www.nc-wreckdiving.com/WRECKS/ABRAMS/ABRAMS.HTML.

21. Viewed at http://www.angelwind.com/hassayampa/photo_suisun-bay.html.

22. Viewed at http://www.diveturkey.com/inaturkey/serce/cargo.htm.

23. Viewed at http://www.fishing-boats.info/Arvor215.htm.

24. Viewed at http://www.formulacruisers.co.nz/review_express45.htm.

terms, Slope *S* (in this case the *forward-astern axis*) assigns to relatum *G* (*the ballast*) a facet *forward*. A search domain is projected off that facet.[25]

The absolute *forward-astern* and *portside-starboard* axes again lack several of Levinson's definitional properties:

– They are not fixed in Levinson's (2003) sense, but are fixed in the Manam sense.
– They are concrete, not abstract.
– They are not arbitrary.
– They are ternary not binary.

Again, these axes provide evidence supporting the notion of absolute proposed here.

8. Logical properties of each FoR

So far I have discussed a number of ways in which spatial references involving axes such as *landward-seaward*, *windward-leeward*, *upsun-downsun* and so on are operationally identical to those involving uncontroversial absolute systems such as Western cardinal directions. In this section I compare the logical properties of uncontroversial absolute references with those involving the kinds of terms I am arguing here also involve absolute FoR.

In his definitions of each FoR, Levinson (2003, pp. 50–53) summarizes the logical properties of each FoR, distinguishing each of them by its unique set of properties. Several of these are internal to his own definitions (such as whether the FoR is a binary or ternary relation), and are not true logical properties. However, several others are logical properties in the sense of properties of the behaviour of references under the application of logic. It is worth examining the systems I am claiming involve absolute FoR in the light of those logical properties. The three properties I will examine are transitivity, converseness, and constancy under rotation.

8.1 Transitivity

In formal logic, transitivity refers to the possibility of a logical inference about the relationship between two objects on the basis of two other known relationships.

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25. For another example of a vessel as external world see the use of terms for 'up' and 'down' within boats in Siar (Frowein, this volume).

Transitivity holds in absolute FoR:

(24)   *The dinghy is east of the yacht.* + *The yacht is east of the freighter.*
       = *The dinghy is east of the freighter.*

Transitivity also holds in relative FoR, but only providing the viewpoint is held constant:

(25)   *The ball is to the left of the post.* + *The post is to the left of the tree.*
       ?= *The ball is to the left of the tree.*

However, transitivity does not hold in intrinsic FoR:

(26)   *Tom is to Mary's left.* + *Mary is to Sam's left.*
       ≠ *Tom is to Sam's left.*

The possible inference in (26) may or may not be true depending on the orientation of each of the arguments. The inference in (25) is true if the viewpoint is held constant, but is not true if it is changed.

8.2   Converseness

Converseness refers to a logical inference on the relationship between one object and another on the basis of a known relationship between the second object and the first.

Converseness is a property of absolute FoR:

(27)   *The yacht is east of the freighter.* = *The freighter is west of the yacht.*

Converseness is also a property of relative FoR, but again only if the viewpoint is held constant:

(28)   *The post is to the left of the tree.* ?= *The tree is to the right of the post.*

However, converseness is not a property of intrinsic FoR:

(29)   *Tom is to Mary's left.* ≠ *Mary is to Tom's right.*

8.3   Constancy under rotation

Constancy under rotation relates to whether a relationship connecting a referent-relatum dyad remains constant when various rotational possibilities are enacted. First, a viewpoint can be relocated 180° around the referent-relatum dyad so that it is on the opposite side of the array (Figure 1). Second, the ground object (i.e. relatum) can be rotated 180° around its axis (Figure 2). Third, the entire referent-relatum dyad can be rotated 180° (Figure 3).
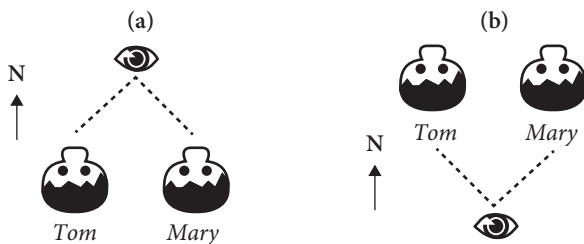
Figure 1. Rotation of viewpoint
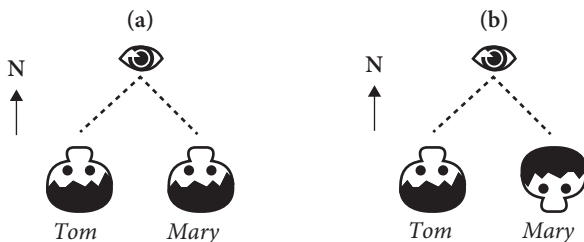
Figure 2. Rotation of relatum (i.e. ground object)
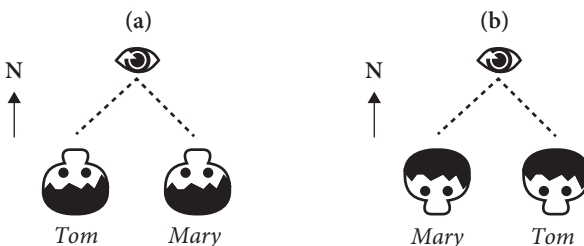
Figure 3. Rotation of referent-relatum dyad

In intrinsic FoR a proposition remains true when the viewpoint is rotated: *Tom* remains *to Mary's left* whether the viewer is in front of Mary (Figure 1a) or behind Mary (Figure 1b). It also holds when the entire dyad is rotated: if the entire dyad of *Tom* and *Mary* are rotated their internal relationship is unchanged – *Tom* remains *to Mary's left* (Figure 3b). However, the description does *not* still hold when the relatum alone is rotated: if *Mary* is rotated 180° on her own axis (Figure 2b), *Tom* is now *to Mary's right*.

Relative FoR has the opposite properties under rotation. A proposition remains true if the relatum is rotated: *Tom* remains *to the right of Mary* from viewpoint if Mary is rotated 180° (Figure 2b). However, the proposition becomes false if the viewpoint is rotated (Figure 1b), when *Tom* becomes *to the left of Mary*, or if the entire dyad is rotated (Figure 3b), when *Tom* again becomes *to the left of Mary*.

In absolute FoR, a description holds if the viewpoint is rotated (Figure 1b), when *Tom* remains *west of Mary* whether the viewer is to the north or south of the dyad, and holds if the relatum is rotated (Figure 2b) – it doesn't matter which direction *Mary* is facing, *Tom* remains *west* of her. However, if the whole dyad is rotated (Figure 3b), the description no longer holds – if the entire dyad of *Tom* and *Mary* is rotated, *Tom* becomes *east of Mary*).

8.4 Summary of logical properties

The logical properties of each FoR in terms of transitivity, converseness, and the three rotational possibilities are summarized in Table 4.

Table 4. Properties of each FoR

	Intrinsic	Relative	Absolute
Transitivity	no	yes (if viewpoint constant)	yes
Converseness	no	yes (if viewpoint constant)	yes
Constancy under rotation of viewpoint	yes	no	yes
Constancy under rotation of relatum	no	yes	yes
Constancy under rotation of dyad	yes	no	no

8.5 Logical properties of systems examined here

The logical properties of systems of spatial reference discussed in Section 5 are identical to those of absolute FoR in Table 4. All support transitive inferences. Compare (30) with (24) above.

(30) a. *The dinghy is landward of the yacht.*
　　　　　　+ The yacht is landward of the freighter.
　　　　　　　= The dinghy is landward of the freighter.

　　b. *The store is clockwise from the village.*
　　　　　　+ The village is clockwise from the church.
　　　　　　　= The store is clockwise from the church.

　　c. *The ship is windward of the boat.*
　　　　　　+ The boat is windward of the man.
　　　　　　　= The ship is windward of the man.

　　d. *The P51s are upsun from the ME109s.*
　　　　　　+ The ME109s are upsun from the bombers.
　　　　　　　= The P51s are upsun from the bombers.

　　e. *The mast-step is forward of the ballast.*
　　　　　　+ The small area is forward of the mast-step.
　　　　　　　= The small area is forward of the ballast.

f. *The wharf is beachward from the store.*
    + *The store is beachward from the house.*
    = *The wharf is beachward from the house.*

All also support converse inferences. Compare (31) with (27) above.

(31) a. *The yacht is landward of the freighter.*
          = *The freighter is seaward of the yacht.*

      b. *The store is clockwise from the village.*
          = *The village is anticlockwise from the store.*

      c. *The ship is windward of the man.*
          = *The man is leeward of the ship.*

      d. *The P51s are upsun from the ME109s.*
          = *The ME109s are downsun from the P51s.*

      e. *The small area is forward of the ballast.*
          = *The ballast is aft of the small area.*

The ad hoc references like that in (30f) (see also Example 9 above) allow converse inferences, but they are not lexified because the process of productive ad hoc derivation does not usually derive directionally opposing pairs of terms.

Examples such as (30) and (31) have the same properties as absolute and relative, but not as intrinsic FoR. In terms of constancy under rotation, references of these types display the same properties as absolute FoR summarized in Table 4, but not those of relative FoR. A description holds if the viewpoint is rotated, as per Figure 1: *the yacht* remains *landward of the freighter* in (30a); *the store* remains *clockwise from the village* in (30b); *the ship* remains *windward of the man* in (30c); *the P51s* remain *upsun of the ME109s* in (30d); *the small area* remains *forward of the ballast* in (30e); and *the wharf* remains *beachward from the house* in (30f).

A description also holds if the relatum is rotated. No matter which way *the freighter* in (30a), *ship* in (30c), or the *ME109s* in (30d) are pointing, or which way any particular facet of the *store* in (30b) or *house* in (30f) is oriented, *the yacht* will still be landward, *the wharf* will still be beachward, etc.

However, a description does not hold if the entire array of the referent-relatum dyad is rotated. Under those conditions *the yacht* in (30a) becomes *seaward of the freighter*; *the store* in (30b) becomes *anticlockwise from the village*; *the ship* in (30c) becomes *leeward of the man*; *the P51s* in (30d) become *downsun from the ME109s*; *the area* in (30e) becomes *aft of the ballast*; and *the house* in (30f) becomes *beachward from the wharf*.

These properties are summarized in Table 5. A comparison of Table 4 and Table 5 demonstrates that each of the systems discussed above displays the logical properties associated with absolute FoR and not those associated with either other FoR.

Table 5. Properties of systems discussed above

	landward-seaward	clockwise-anticlockwise	windward-leeward	upsun-downsun	forward-aft	beachward
Transitivity	Yes	Yes	Yes	Yes	Yes	Yes
Converseness	Yes	Yes	Yes	Yes	Yes	–
Constancy under rotation of viewpoint	Yes	Yes	Yes	Yes	Yes	Yes
Constancy under rotation of relatum	Yes	Yes	Yes	Yes	Yes	Yes
Constancy under rotation of dyad	No	No	No	No	No	No

9.   Topographic Correspondence Hypothesis

Systems of absolute spatial reference vary very considerably across languages, as the few examples given in Section 4.5 illustrate (see e.g. Levinson & Wilkins, 2006a; Pederson et al., 1998). For Levinson and his collaborators, this prompts the Whorfian conclusion that the choice of absolute FoR, and the choice of vectors forming the coordinate system, are arbitrary.

I have argued instead that even in apparently abstracted absolute systems, directions are anchored in environmental cues. I have argued elsewhere (Palmer, 2002, 2004, 2005) that absolute coordinate systems are not merely anchored in, but are motivated by the environment. In other words, it is not merely that aspects of a language's spatial system are associated by speakers with phenomena in the external world for operational purposes. Rather, that those phenomena prompt speakers to construct a spatial system with categories that are associated with them. This leads to the hypothesis that a correlation will exist between a language's system of absolute spatial reference and the topography of the language locus. This correlation would be expected to cross-cut other factors such as phylogenetic affiliation. This hypothesis was first outlined in Palmer (2002, pp. 141–146) and will be formulated more explicitly here as the Topographic Correspondence Hypothesis. If the hypothesis is supported by cross-linguistic data, the implication will be that coordinate systems in absolute FoR are constructed in response to the environment.

9.1   Predictions

The Topographic Correspondence Hypothesis (henceforth TCH) makes two complementary predictions: variation in diverse environments and similarities in similar environments.

The first prediction is that languages spoken in diverse topographic environments, even when those languages are closely related, will tend to have systems of absolute spatial reference that differ in ways that correlate to topographic variation, and further that individual languages spoken in a range of environments will show similar diversity.

The second prediction is that languages spoken in similar topographic environments will tend to have similar systems of absolute spatial reference, regardless of phylogenetic, areal or typological affiliation, and that a similar environment will lead to similar spatial systems, even in entirely unrelated languages spoken in separate parts of the world.

9.2 Correlation between urban/rural environment and FoR choice

The focus in this chapter is on the nature of absolute systems employed by languages. However, if the hypothesis proves correct, then it might also be expected that the choice of FoR itself might be influenced by the environment. The three FoRs are not distributed evenly across languages. Intrinsic FoR appears to be employed to some extent in all languages. On the other hand, languages typically favour either absolute or relative FoR, but seldom both (Levinson & Wilkins, 2006c, p. 22, 2006b, pp. 541–542), and, to an extent, which is preferred appears to correlate with the environment in which the language is spoken. Urban environments tend to be associated with a preference for relative FoR, while rural environments tend to be associated with a preference for absolute FoR (Majid et al., 2004, p. 111; Burenhult & Levinson, 2008, p. 136). Even within one language this opposition can exist: rural Tamils, for example, typically prefer absolute FoR while urban Tamils use only relative FoR (Pederson, 1993, 2006, pp. 429–434). This is the case to the extent that rural Tamils moving to urban areas typically switch from absolute to relative FoR (Pederson, 2006, p. 432).

Presumably a preference for relative FoR in urban areas may occur because natural environmental factors such as the location of the sea or mountains or even the path of the sun may be less accessible in a dense network of streets and buildings, so absolute directions may be difficult to monitor and manipulate. However, where the layout of a city is geometrically regular, an absolute coordinate system may emerge, such as the *uptown-downtown* vs *across town* system in New York.[26] In *Grand Central Terminal is just 6 blocks downtown from our hotel*,[27] for example, a search domain is projected off the hotel, not on the basis of an internal asymmetry of the relatum *hotel*, or on the basis of a viewpoint, but on the basis of an asymmetry imposed on the dyad on the basis of the wider world in which it is situated (an *uptown-downtown* axis).[28] It is intriguing that even in urban contexts, if

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26. According to LaPolla (pers. com.) a similar situation exists in Beijing, with its grid layout.

27. Viewed at http://www.hyatt48lex.com/midtown-manhattan-hotel-map.aspx.

28. A nice example of this is seen in the following question and answer, including both static and dynamic references:

> Q: "*When you take the subway, which direction is UPTOWN and which is DOWN-TOWN? which way is if u want to go towards times square? and which way is if u want to go to NYU campus?*"

the environment provides an accessible anchoring external phenomenon, absolute systems may develop.

9.3   Correlation between hunter-gatherer lifestyle and FoR choice

Hunter-gatherer lifestyles, with their intimate interaction with the natural environment, correlate with primary use of absolute FoR (Levinson, 2003, p. 212; Majid et al., 2004, p. 112; Terrill & Burenhult, 2008, p. 102). Examples include Guugu Yimithirr (Aboriginal, North Queensland; Haviland, 1998; Levinson, 1997, 2003, pp. 113–146); Arrernte (Aboriginal, Central Australia; Levinson, 2003, pp. 170–215; Wilkins, 2006); Hai‖om (Khoisan, Namibia; Widlok, 1997, 2008); and Inuit (Eskimo-Aleut, Alaska; Fortescue, 1988).

In cases where the language environment is relatively featureless – in desert country, for example – apparent cardinal systems are employed. However, directions in such systems are typically, perhaps always, associated with the path of the sun, prevailing wind directions, or other features of the external world. In ǂAkhoe Hai‖om, for example, 'east' and 'west' are associated with the path of the sun, while 'north' and 'south' are anchored in soil and plant types associated with the relevant regions of the language locus (Widlok, 2008, pp. 364–369).

Absolute FoR is also used in the languages of hunter-gatherers living in more topographically rich environments, where absolute systems other than cardinal terms are employed. Even in Arrernte, spoken in the Central Australian desert and regarded as a classic example of a fixed fully abstract cardinal system (Levinson & Wilkins, 2006c, p. 22, 2006b, p. 541), some dialects employ terms for 'upriver' and 'downriver' in place of 'north' and 'south' (Henderson & Dobson, 1994, pp. 208, 514–515; Wilkins, 2006, p. 54, Note 7). In the phylogenetically diverse indigenous languages of the North Pacific Rim a wide range of systems are used, including inland riverine, coastal, and island-based systems (Fortescue, 1988, 2011). The Jaminjung (Aboriginal, Northern Territory; Hoffmann, 2011; Schultze-Berndt, 2006, pp. 103–107), living on either side of a major river in a region with numerous smaller watercourses, use a riverine system with an *upriver-downriver* axis and an *away from-towards river* axis.

A: "It is all relative. [sic!] *If you are starting on West 23rd street, for example, Times Square would be UPTOWN. But if you are starting on West 72nd Street, Times Square would be DOWNTOWN. Times Square is pretty much in the middle. NYU is further downtown, so you would most likely be traveling DOWNTOWN. However it depends on where you are starting out.*"

Viewed at https://answers.yahoo.com/question/index?qid=20091005120018AAQczlC

As with Tzeltal and Makian Taba in Section 5.6, the application of the Jaminjung system depends on scale. Distant locations are 'downriver' if they are in the direction of the overall drainage of the river, while for nearby locations the actual twists and turns of the river override the overall direction of drainage (Hoffmann, 2011, p. 95; Schultze-Berndt, 2006, pp. 104–105). Moreover, it is not necessarily the major river but "the nearest salient watercourse" that determines the use of terms in the Jaminjung system (Schultze-Berndt, 2006, p. 105).[29] All this in a region where rivers are dry for most of the year.[30]

The Jahai (Mon Khmer, Malay Peninsular; Burenhult, 2005, 2008b; Terrill & Burenhult, 2008, pp. 101–111), also traditionally hunter-gatherers, use a riverine system comparable to that in Jaminjung. However, in the Jahai system

> […] these directions are dependent on the actual [river] profile and are not abstracted away from the direction of water flow; the referential direction changes with individual rivers, streams and even bends.
>
> (Terrill & Burenhult, 2008, p. 102)

For this reason, Terrill & Burenhult do not regard the Jahai system as an abstract system of fixed bearings and therefore treat it as an exception to the association between hunter-gatherer lifestyle and absolute FoR (Terrill & Burenhult, 2008, p. 102). That conclusion is at odds with analyses of the similar Jaminung system as an instance of absolute FoR (Hoffmann, 2011; Levinson & Wilkins, 2006b, pp. 541–541; Schultze-Berndt, 2006, pp. 104–107). Under the approach proposed here, the Jahai system involves absolute FoR, and is therefore not an exception to the hunter-gatherer generalization.

9.4   The environment variable method

Despite correlations such as those in Sections 9.2 and 9.3, Levinson and his collaborators reject what they refer to as "ecological determinism". Beyond the urban-relative and rural-absolute association, Majid et al. (2004, p. 112) find no correlates between FoR and environment. However, their study classifies environment only in very broad categories of ecological zones, such as *temperate* or *subtropical*, and looks only at the choice between absolute, relative and intrinsic FoR, and not the

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29.   The riverine system of the agriculturalist Asmat (Trans New Guinea) of southern West Papua (Palmer, 2002, pp. 143–144) takes this one step further, with separate terms lexifying an *upriver-downriver* axis for large watercourses, and an *upstream-downstream* axis for smaller watercourses.

30.   Even when dry, features of the river bed and the disposition of plant growth and of deposited objects demonstrate the direction of flow of the watercourse.

type of system within a FoR. More fine-grained analyses of environments (such as *riverine*, *coastal*, *mountain* etc.) are absent, so correlations between environment and specific subtypes of absolute systems are not picked up.

Similarly, recent work examining landscape in language finds considerable cross-linguistic diversity in lexicalized topological terminology (Burenhult, 2008a; Burenhult & Levinson, 2008). However, grammaticized systems of spatial reference involving absolute FoR do not invoke the degree of detail found in topographic terminology. Instead, such grammaticized systems invoke a small set of key features of those environments, resulting in systems that are much more similar.

The Topographic Correspondence Hypothesis requires a more fine-grained analysis of grammaticized linguistic systems of spatial reference and topography of language locus than simple ecological zone and FoR choice. In order to test TCH, we need a methodology that makes the environment an independent variable. Palmer (2002, pp. 141–146) proposes what I will call here the Environment Variable Method (EVM). Addressing the predictions in Section 9.1, the method involves two complementary dimensions of comparison between language/environment pairs.

The first dimension of comparison holds the language constant and varies the environment. This dimension compares the spatial systems of closely related linguistic varieties that are spoken in diverse environments (mountain versus small island, riverine interior versus coastal, etc.). Ideally the linguistic varieties are as phylogenetically close as possible. Closely related languages may be compared, and the closer their phylogenetic relationship the better. In the ideal situation, a single language spoken in diverse environments is targeted. Similarly, the more diverse the environments the better. For example, the spatial system employed by a language as spoken on a coast might be compared with the system employed by speakers of the same language in the mountainous interior. TCH predicts that even in a single language, the spatial system employed in each environment will differ commensurately with variation in those environments.

The second dimension of comparison holds the environment constant and varies the languages targeted. It thus compares the spatial systems of unrelated languages spoken in similar environments. Languages should be phylogenetically unelated in order to rule out the inheritance of similar spatial systems. While phylogenetically unrelated languages in the same actual location would hold the environment most constant, such languages would be in contact and similarities may result from mutual influence. Consequently, unrelated languages spoken in separate locations must be targeted in order to eliminate the possibility of areal influence. However, the locations of the languages must be carefully selected to be as topographically similar as possible. For example, two unrelated languages both spoken on separate but similar small round islands that rise to a high central

mountain might be compared. The TCH predicts that unrelated languages will display similar spatial systems with features corresponding to similarities in the environments.

9.5   Pilot findings

Palmer (2005) presents the findings of a pilot study testing the Environment Variable Method, based on published descriptions of spatial reference systems. These findings provide support for the TCH.

Along the first dimension of comparison outlined above, Palmer investigated Makassarese, Embaloh and Aralle-Tabulahan, three relatively closely related languages belonging to the South Sulawesi branch of the West-Malayo-Polyesian subgroup of Austronesian.

Makassarese (Jukes, 2006, pp. 194–196; Liebner, 2005) is spoken along the coast around the western and southern edges of the south western peninsular of Sulawesi. It has a coastal absolute system that closely resembles that of Manam (Section 5.3) and Taba (Section 5.6), in particular that of Taba on the south western peninsular of mainland Halmahera. On the west coast 'landward' corresponds roughly to east and 'seaward' to west, while 'clockwise' corresponds to north and 'anticlockwise' to south. However, the true nature of the Makassarese directionals are revealed on the southern coast of the peninsula, where the system is rotated, with 'landward' corresponding to north, 'clockwise' to west etc. (Jukes, 2006, p. 195, Note 93).[31]

Table 6. Makassarese absolute directions

raya	'landward'
lau'	'seaward'
wara'	'clockwise around peninsular'
timboro'	'anticlockwise around peninsular'

Embaloh (Adelaar, 1997, pp. 69–70) is spoken in the riverine interior of Borneo. The region is dominated by rivers, and these play a crucial role in the lives of Embaloh speakers. Villages are generally built on river banks, and the river is a crucial source of food and the main thoroughfare (Adelaar, 1997, p. 69). Embaloh employs a riverine absolute system similar to that in Jaminjung, with an upriver-downriver axis, an *away from-towards river* axis, and an *across river* axis.

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31.   A similar system operates in Siar on the island of New Ireland (see Frowein, this vol.).

Table 7. Embaloh absolute directions

urait	'upriver'
kalaut	'downriver'
anait	'away from river', 'upwards'
indoor	'towards river', 'downwards'
suali	'across' (away from bank across river)

Aralle-Tabulahan (McKenzie, 1997) is spoken in the highlands of Sulawesi, in a region of high mountains and many rivers (McKenzie, 1997, p. 224). Like Embaloh, the language has a spatial system that makes use of an *upriver-downriver* axis and an *across river* axis. In addition, the system also has an elevational system (referred to by McKenzie as 'contour') resembling that in mountain languages such as Nimboran (Steinhauer, 1997; Voorhoeve, 1997), which makes use of an axis recognising higher and lower altitudes, and two undifferentiated transverse axes – one along the mountainside at the same altitude, the other projecting out from the mountainside to a point of comparable altitude across the river or valley. The result is a highly complex and sophisticated system, shown in Table 8.

Table 8. Aralle-Tabulahan absolute directions

Riverine		Elevational	
tama	'upriver', 'inwards'	*dai'*	'uphill', 'upwards'
sau	'downriver', 'outwards'	*naung*	'downhill', 'downwards'
		pano	'along' (same altitude along hillside)
	bete'	'across' (same altitude on far side of river/valley)	

While the three South Sulawesi languages are closely related, they have systems of absolute spatial reference that employ diverse conceptual axes organized in distinct ways. In each case the conceptual components of the systems correlate with the most salient aspects of the topography of the language locus.

For the second dimension of comparison, Palmer (2005) also investigated four phylogenetically and areally unrelated languages that have absolute systems and are spoken in similar environments dominated by mountains and rivers. These languages are Aralle-Tabulahan (see above); Samo, a Papuan language of the Trans New Guinea family spoken in the New Guinea Highlands (Shaw & Shaw, 1973); Dyirbal, an Australian aboriginal language of North Queensland (Dixon, 1972); and Florutz German, an Indo-European language spoken in Italian Tyrol (Rowley, 1980). The spatial reference systems described for each are strikingly similar.

Samo is spoken on the south side of Papua New Guinea's central ranges, in a region that "consists of parallel ridges rising between innumerable streams and rivers which generally run from east to west […] on the north-south axis one is continually crossing streams and traversing ridges" (Shaw & Shaw, 1973, pp. 158–159). Its spatial reference system resembles closely that found in Aralle-Tabulahan, with the exception that an *along* the same altitude axis has not been reported for Samo. It also appears that the *upriver-downriver* terms do not also lexify *inwards-outwards*.

Table 9. Samo absolute directions

Riverine		Elevational	
to-	'upriver'	*fo-*	'uphill', 'upwards'
ya-	'downriver'	*mun-*	'downhill', 'downwards'
sou-	'across' (same altitude on far side of river/valley)		

Dyirbal was spoken "at the foot of the range [and] in the higher country around the upper reaches of the Tully River" (Dixon, 1972, p. 24), an area with "many short rivers, waterfalls and swamps" (Dixon, 1972, p. 27). It lexifies the same axes as Samo and, as in Samo, it appears that no *along* axis ('same altitude along hillside', as seen in Aralle-Tabulahan) is present.

Table 10. Dyirbal absolute directions

Riverine		Elevational	
-dawa	'upriver'	*-daya*	'uphill', 'upwards'
-balba	'downriver'	*-bayja*	'downhill', 'downwards'
guya-	'across' (same altitude on far side of river/valley)		

Florutz German is one of the Alpine dialects at the southern extreme of the West Germanic dialect network, spoken on the Italian side of the Austrian-Italian border in South Tyrol, in a region of alpine river valleys (Rowley, 1980). Its absolute system resembles that of Aralle-Tabulahan more closely than Samo or Dyirbal, in that it also displays an *along* same altitude axis. Like Aralle-Tabulahan, it also colexifies *upriver-downriver* with *inwards-outwards*, and *uphill-downhill* with *upwards-downwards*. It differs from Aralle-Tabulahan in that the terms lexifying the *across* axis also express a deictic distinction between moving towards or away from the deictic centre. However, this does not affect the status of the terms within absolute FoR, and deixis interacts with the FoR systems in all four

languages in various ways. A more important difference relating to the *across* axis is that in Florutz German, in addition to projecting out from the mountainside to points of a similar altitude on the opposite side a river or valley, *across* also notionally projects through the mountain to a point of comparable altitude in an adjacent valley on the far side of the mountain. It is not known whether this is also true for Aralle-Tabulahan, Samo or Dyirbal, but it is not reported for those languages.

Table 11. Florutz German absolute directions

Riverine		Elevational	
/in/	'upriver', 'inwards'	/ao/	'uphill', 'upwards'
/aos/	'downriver', 'outwards'	/o:/	'downhill', 'downwards'
		/um(-a)/	'along' (same altitude along hillside)
	/du:r/, /he:r/	'across' (same altitude on far side of river/valley/mountain)	

Although absolute systems of the four languages surveyed by Palmer (2005) in this second comparison display a number of minor variations, they are largely identical in their core features. All make use of axes that relate to watercourses, with an *upriver-downriver* axis, along with an elevation-based distinction, with an *uphill-downhill* axis and a cross-axis that interacts both with the *uphill-downhill* and the *upriver-downriver* axis. In each case this complex system correlates directly with the topography of the language locus. The four languages are phylogenetically entirely unrelated, and there can be no question of areal influence. The similarities between their absolute systems arise as a result of similarities in the topographies of the loci in which they are spoken.

9.6   Testing the method: Absolute FoR in atoll-based languages

The pilot study outlined in the previous section applies the Environment Variable Method and its findings support the Topographic Correspondence Hypothesis. However, as the study relied on secondary sources of varying degrees of detail and quality, the findings can only be interpreted as suggestive. To properly test the hypothesis, and the effectiveness of EVM as an approach, primary data collection using experimental methods is required to ensure full comparability of data.

Atoll-based languages are a useful test case for such a study. The atoll is an environment with highly distinctive physical features. Atolls consist of narrow strips of land and fringe reef around the perimeter of a large central lagoon. Human habitation is confined to these narrow strips of land, and in most locations on land both the lagoon inside the atoll and the open ocean outside it are simultaneously visible. The environment is dominated by these two highly salient bodies

of water, and the distinction between lagoon and ocean dominates the lives of atoll residents. The lagoon is typically much calmer than the open ocean, and furnished with beaches in contrast with the ocean coast's exposed reefs, ocean currents and unbroken winds. Boats are launched into the lagoon, habitation is clustered around the lagoon shore, and atoll-based communities are reported as associating the ocean side of islands as dangerous and outside social control (see e.g. Hoëm, 1993 for Tokelau). TCH predicts that atoll-based languages should have particular features in their systems of absolute reference that correlate with specific features in their environment, and furthermore, that phylogenetically diverse languages spoken on atolls will display similarities relating to these features.

Palmer (2007) is a preliminary study based on primary data collected in the atoll-based Marshallese (Central Micronesian, Oceanic, Micronesia) and Kiribati (Central Micronesian, Oceanic, Micronesia) languages, supplemented with secondary material on Tokelauan (Polynesian, Oceanic, Tokelau) (Hoëm, 1993; Hooper, 2004). This is supplemented here with data from another atoll-based language, Iaai (Loyalty, Oceanic, New Caledonia; Ozanne-Rivierre, 1976, 1997, 2004). All four languages have several separate but complementary absolute systems employed in different domains. All four have a cardinal system associated with the path of the sun and trade winds, which is used on the open ocean. A second maritime system employs a landward-seaward axis and is used on the lagoon or at sea within sight of land. This is found in Marshallese and Tokelauan, but not in Kiribati, where the cardinal system is used in all maritime contexts. Crucially for the present purposes, all four languages also have an absolute system employed only on land – on the narrow strips around the lagoon separating the two highly salient, highly distinct bodies of water. In line with the predictions of TCH, this terrestrial system makes primary use of a lagoonward-oceanward axis in all four languages. In all it lacks a cross-axis, but uses other strategies to refer to cross directions, including cardinal terms, or true landmarks.[32] Bizarrely, all languages but Kiribati also employ an absolute directional (with no opposing term) indicating the direction of wilderness, wherever that happens to be located on any particular island). On islands without an area of wilderness this term cannot be used in any meaningful way. The terrestrial systems of all four languages are shown in Table 12.

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32.   For example, on the long, narrow, east-west oriented island at the southern perimeter of the Marshall Islands' Majuro atoll, the lagoonward-oceanward axis has as its effective cross axis the east-west axis, while on the north-south oriented land at the eastern end of the atoll, lagoonward-oceanward is crossed by the north-south axis.

Table 12. Terrestrial absolute directions in four atoll-based languages

	Marshallese	Kiribati	Tokelauan	Iaai
oceanward	*lik*	*-rake*	*tua*	*cöu*
lagoonward	*ar*	*-rio*	*namō*	*goony*
wildernessward	*ooj*	–	*vua*	*hnyoot*

As TCH predicts, the unique topographic features of this unusual environment correspond with certain particularities of the absolute system of spatial reference. A lagoonward-oceanward axis appears to be unique to atoll-based languages and occurs in all atoll-based languages so far investigated. However, these are the findings of a small scale preliminary study. Further, the four languages discussed above are all within the Oceanic branch of Austronesian. Marshallese and Kiribati are relatively closely related members of the Nuclear Micronesian subgroup of Oceanic. Iaai and Tokelaun, on the other hand, are only distantly related to each other and to Marshallese and Kiribati, and do not share a common atoll-based ancestor with each other or the Micronesian languages.[33]

Nonetheless, they are still not an ideal set of languages for comparison along the second dimension of comparison as they do share phylogenetic affiliation, so inheritance of a system that lent itself to reconfiguration in a particular way once faced with an atoll environment cannot be ruled out. Under ideal circumstances, this second dimension of comparison would target languages that are both phylogenetically and areally unrelated. Unfortunately, almost all indigenous atoll-based languages are Austronesian, most of them belonging to the Oceanic subgroup. However, one suitable language of comparison does exist. Dhivehi is an Indo-European language, and therefore wholly unrelated to Austronesian. Since it is spoken in the Maldives, in the Indian Ocean, it is areally separate from the Austronesian-speaking world. There is no evidence of any historical contact between Austronesian and Dhivehi. A project now underway with the present author as lead CI comparing spatial reference in Marshallese with that in Dhivehi will test TCH in this environment.

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33.   Kiribati and Marshallese belong to different subgroups of the Central Micronesian branch of Oceanic. The homeland of their common ancestor has not been firmly established, but there is linguistic and archaeological evidence that eastern Micronesia was settled from high islands, not atolls, although it is possible that the Marshall islands were settled from Kiribati (see Lynch, Ross, & Crowley, 2002, pp. 117–118; Petersen, 2009, p. 42).

10.   Conclusions

This chapter has re-examined the definition of absolute Frame of Reference. According to the standard definition, this is a binary relation involving bearings that are arbitrary, abstract and fixed. Employing the notion of a referent-relatum dyad, I have argued that absolute FoR resembles relative FoR in its operational dependence on an anchor point outside the referent-relatum dyad. In relative FoR this viewpoint can readily be seen as a third argument of the relation. The nature of absolute FoR means that this third argument is less readily identifiable. Nonetheless, the operational dependence of absolute FoR on features of the external world means that the anchoring phenomenon in that external world constitutes a third participant and this makes absolute relations ternary rather than binary. I have argued that Levinson's notion of Slope in fact recognizes this third argument.

The chapter also re-examined the notion of fixedness. It argued that the traditional Levinsonian requirement that absolute bearings hold a fixed relationship with a direction in the Western cardinal system is stipulative and contradicted by evidence of numerous systems that are operationally identical to NSEW systems, and are treated in the literature as examples of absolute FoR, but involve axes that vary in relation to compass directions. Nevertheless, these systems remain entirely consistent and 'fixed' within the conceptual framework of the system within which they operate. This inconsistency in the way fixedness is understood as a characteristic of absolute FoR has led to inconsistencies in the theoretical treatment of similar systems. For example, the riverine system of Jaminjung is treated as absolute by Hoffmann (2011) and Schultze-Berndt (2006), while the similar Jahai system is ruled out as absolute by Terrill & Burenhult (2008) because its *upriver-downriver* axis follows the actual contours of the river and is therefore not fixed in relation to compass points, a fact that is equally true of Jaminjung.

This chapter further argued that axes that are inherently variable and unpredictable in their bearing, such as the wind-direction based axis *windward-leeward*, and even ad hoc references such as *beachward*, are operationally identical to uncontroversially absolute axes such as *east-west*, and cannot be distinguished from them on the basis of any well-motivated principle. Nevertheless, these systems are not 'fixed' in relation to compass bearings. The conclusion then is that fixedness is not an operational requirement of absolute FoR. This has implications for the requirements of an absolute FoR to be abstract and arbitrary. If absolute directions do not have to be fixed and can depend on concrete anchoring phenomena in the external world (such as the direction of the prevailing wind in a particular location on a particular occasion, or the location of the beach in relation to a particular relatum), then such directions need not be abstractions. If absolute axes need not be abstract, they cannot be arbitrary as a definitional requirement.

Levinson's definitional requirement that absolute FoR involves arbitrary, abstract, fixed bearings is stipulative, requiring the ruling out of some systems or even subcomponents of systems that are operationally identical to uncontroversially absolute systems. This chapter argues instead that a consistent definition of absolute FoR is operational in nature: absolute FoR is a strategy for projecting a search domain or path off a relatum on the basis of an anchor outside the referent-relatum dyad other than a viewpoint, that anchor being a feature or features of an *external world* in which the referent-relatum dyad is perceived to be located. This definition can be consistently applied to all spatial references that are anchored in external phenomena, ranging from the path of the sun, through the direction of wind or flow of a watercourse, overall fall of land across a region, or location of the lagoon on an atoll, to the location of a beach or building in an *ad hoc* reference. All systems in which a search domain or path is projected off a relatum on the basis of an anchor external to the referent-relatum dyad without invoking a viewpoint share the same logical properties. This chapter argues that all systems with these same operational characteristics and properties are instances of absolute FoR.

To formulate this perspective on absolute FoR, I have proposed the Topographic Correspondence Hypothesis, which postulates a correlation between the specific features of a system of spatial reference in absolute FoR and key salient features of the topography of the language locus. It predicts that individual languages spoken in diverse environments will have absolute spatial systems that differ in predictable ways commensurate with differences in their environments and, conversely, phylogenetically and areally unrelated languages spoken in similar environments will have absolute spatial systems that are similar in ways that correlate with these environmental similarities. To test this hypothesis, I propose the Environment Variable Method, under which the environment is treated as a variable that may be held constant or varied as required.

The Topographic Correspondence Hypothesis has implications for the relationship between language and the construction of conceptual representations of space. Considerable cross-linguistic diversity exists in systems of spatial reference. Spatial language and non-linguistic behaviour are correlated, so both manifest a cross-modal conceptual representation (or cross-modally compatible representations) of space (Pederson et al., 1998, pp. 574–584; Levinson, 2003, pp. 130–142, 154–168, 178–188). Cross-modal diversity has therefore been taken to indicate a Whorfian relationship in which the existence of diverse linguistic systems gives rise to commensurate diversity in non-linguistic cognitive behaviour such as gesture, inferential reasoning, memory recognition and recall, and so on (Levinson, 1992: 25 Note 67; Levinson, 1997, p. 125, 2000, p. 281; Majid et al., 2004, p. 113; Pederson et al., 1998, pp. 584–586). It is this neo-Whorfian assumption that makes the notion of arbitrariness crucial to a

Levinsonian understanding of absolute FoR. The traditional alternative from cognitive science, that linguistic spatial categories are straightforward mappings from a pre-existing biologically programmed conceptual representation of space, as Li & Gleitman (2002, p. 266) assert (see Majid et al., 2004, p. 113), is surely implausible – it is highly unlikely that we are all born with a conceptual category *lagoonward*, for instance. However, a third possibility exists, namely that absolute FoR in language reflects universal human cognitive responses to environment. This chapter has argued that absolute systems need not be arbitrary abstractions and that absolute systems are anchored in the external world. The Topographic Correspondence Hypothesis suggests the reverse of the neo-Whorfian conclusion: spatial systems within absolute FoR are not merely anchored in the external world, but are motivated by it. If linguistic spatial systems correlate predictably with a pre-existing external world, then they must be constructed in response to that world in a process mediated by higher level cross-modal conceptual representations. If confirmed, the Topographic Correspondence Hypothesis suggests that humans, when faced with a handful of key salient features in their environment, will construct conceptual representations of space in predictable ways. This then emerges in their language.

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Walk around the clock

The shaping of a (counter-)clockwise distinction in Siar directionals

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Most Oceanic languages have complex systems of directionals which have been shaped by geographical, topographical or meteorological factors. Siar, an Oceanic language of the Patpatar-Tolai subgroup in New Ireland Province of Papua New Guinea, is one of these languages. However, it is difficult to determine the exact position of some of its directionals on this axis because of superficially contradictory data (that is, the same speaker uses different directionals in the same context). I will here present a theory which assumes that two of the Siar directionals have been undergoing semantic adjustment because of the migration of some Siar speakers from the east coast to the previously unoccupied west coast. A result of this migration was the reanalysis of these two directionals as clockwise and counter-clockwise directionals, an uncommon phenomenon cross-linguistically.

1. The Siar language

Siar is a member of the Patpatar-Tolai language group that belongs to the Western Oceanic sub-branch of the Austronesian language family. It is spoken around Cape St. George in the southernmost part of New Ireland Province in eastern Papua New Guinea. There are about 3,500 Siar speakers (2000 census), including a small number of non-native speakers, usually spouses of native Siar speakers. Most of this last group are bilingual in Siar and Tok Pisin. Older generations of Siar speakers are all bilingual, because they were educated in Tolai (Kuanua). Two dialects, West Coast Siar and East Coast Siar, can be distinguished. The differences between the two dialects are limited to a small number

of phonological and lexical differences. Siar speakers on both coasts regard the east coast dialect as the more conservative and purer variety of the language. This corresponds to what we know about the settlement history of the Siar in southern New Ireland. Siar speakers originally occupied the east coast and later moved towards the west coast. West coast settlements had frequent contact with East New Britain Province in the west, which led to an increased use of Tok Pisin. This migration history is important to the theory proposed in this paper. The mountainous interior of southern New Ireland is uninhabited, since the mountains do not allow for an easy walk from one coast to the other. As a result, the Siar people need to travel by boat around Cape St George between the east and west coasts.
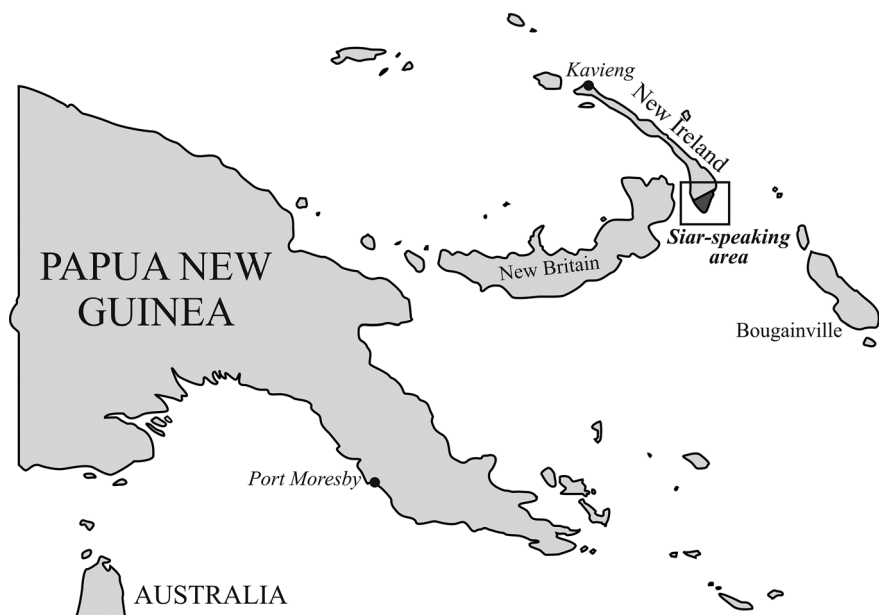
Map 1. The Location of the Siar language

Siar people make their living mostly from gardening, fishing and copra processing. The language area remains one of the more traditional areas in New Ireland Province since the area is fairly isolated due to the lack of local infrastructure. The main means of transport are canoes and speedboats (dinghies), the latter allowing for shopping tours to Kokopo and Rabaul in East New Britain Province. While northern New Ireland Province enjoys cell phone coverage,

the southern part of the islands for now still has to rely on traditional modes of communication.

Siar is a fairly isolating language with little derivational morphology and even less inflectional morphology. Basic word order is AVO/SV. While its phonology and morphology are fairly simple, Siar noun phrase structure is much more complex. There are three noun classes as well as a rich set of noun phrase markers that distinguish features such as number, noun class, mass nouns, physical size, animacy and humanness. The Siar demonstrative system is another area of relative complexity, and some of its aspects will be discussed below in more detail.

Section 2 gives a grammatical overview of the Siar directional system and illustrates that the system is a frequently used, important and highly complex phenomenon in the language. Section 3 discusses the general semantics of demonstratives. The two (counter-)clockwise demonstratives are discussed in greater detail in Section 4, which describes how the (counter-)clockwise distinction has been shaped by the geographic environment and by a migration wave from the east coast to the west coast. Section 5 provides etymological evidence for the evolution of the (counter)clockwise distinction. Section 6 briefly looks at other (counter-)clockwise systems in related languages.

2.   Siar demonstratives

The Siar demonstrative system is one of the more complex areas of Siar grammar. First attempts to analyze its structure and semantics are discussed by Ross (2002) and – in more detail – by Rowe (2005). Both accounts have gaps in their definition of the demonstrative paradigm and tend to disagree on certain semantic aspects. However, given the complexity and sometimes seemingly opaque semantics of the system, this is not surprising.

Most Oceanic languages have complex systems of directionals which have been shaped by geographical, topographical or meteorological factors (Palmer, 2002, this volume; François, 2003; Ross, 2003b, 2004). It has been assumed that in Proto-Oceanic the cardinal axis was based on the direction of the prevailing winds, and that modern Oceanic languages such as Siar have adjusted this system according to the particularities of each individual language location (François, 2004).

All Siar demonstratives contain one of the demonstrative roots given in Table 1.

Table 1. Demonstrative roots in Siar

Demonstrative root	Meaning/Function	Gloss
-*a*	proximal/near speaker	PROX
-*è*	indexical[1]	INDX (☞)
-*ing*	anaphoric	ANA
-*óng*	1. following the coast in clockwise direction 2. backward	CLK
-*im*	1. following the coast in counter-clockwise direction 2. downward 3. seaward 4. towards New Ireland when outside New Ireland 5. towards Siar area when outside Siar area 6. future (until)	CCLK
-(*i*)*sai*	1. upward 2. inside 3. away from New Ireland	DIST
-*ah*	interrogative	INT

The semantics of these roots will be discussed in more detail in Section 2.2. Demonstrative roots are used in the following five main types of demonstratives:[2]

– Demonstrative determiners (Section 2.1)
– Demonstrative pronouns (Section 2.2)
– Demonstrative existentials (Section 2.3)
– Locative adverbs (Section 2.4)
– Allative adverbs (Section 2.5)

The syntax of each of these types will be briefly introduced in the following sections.

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1. The notion *indexical* is in some approaches used as a general synonym for a deictic expression. The function of the Siar indexical demonstrative root involves a pointing gesture with the fingers or hands. This is represented by the ☞ symbol in the glossing.

2. There are in fact two additional types: personal demonstratives (e.g. this/that person) and temporal demonstratives (e.g. at this/that time). These come with additional problems and are ignored in this paper for the sake of simplicity.

2.1 Demonstrative determiners

Demonstrative determiners specify and accompany NPs. They are rather similar to the demonstrative articles *this* and *that* in English, but Siar makes a much more detailed distinction, as can be seen in Table 2.[3]

Table 2. The demonstrative determiner/demonstrative pronoun paradigm

SG	NSG/post-NP	Translation	Gloss
d-a	*n-a*	'this/these'	PROX
d-è	*n-è*		INDX (☞)
d-ing	*n-ing*		ANA
d-óng	*n-óng*	'that/those'	CLK
d-im	*n-im*		CCLK
d-isai	*n-isai*		DIST
–	–		INT

In order to derive a demonstrative determiner, a demonstrative root is attached to a determiner base, which is *d-* for singular NPs (see example (1)) and *n-* for non-singular or post-nominal NPs (compare Table 2 columns 1 and 2). Examples of singular forms and non-singular/postnominal forms are given in (1a-b).

(1) a. *Ó-l   ari   sur   ó-l   rè   i   **d–a***
         2.SG-IRR BEN   INTENT   2.SG-IRR see 3.SG DEM.SG-PROX
         you-will   come in.order.to you-will see it   this-here

         a   pukun!
         NPM:DIM   place
         the   place
         'Come to me to see this place here!' (ÈRB [12])

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b.   *A*   *palang* ***n-è***   *a*   *kès*
     NPM:DIM plank   DEM.NSG-INDX 1.SG sit
     the   plank   this-here.☞   I   sit

ó-n   *i*   *bi-bing*   *kòl.*
OBL-3.SG.POSS 3.SG RED-press   very
on-it   it   presses   very

'This plank I am sitting on presses very much.' (TAM [6])

As shown in (1b), the non-singular form may be used to refer to a singular referent when it is located in postnominal position.

2.2   Demonstrative pronouns

Demonstrative pronouns do not modify NPs with a head noun like demonstrative determiners do, but they head their own NPs. Their forms are the same as the ones for the demonstrative determiners (listed in Table 2). Example (2a) shows a singular form; a non-singular form is given in (2b).

(2)   a.   *A*   *in*   *ép*   *yai*   *i*   ***d–a.***
          NPM:DIM fruit NPM:COMM tree 3.SG DEM.SG-PROX
          the   fruit the   tree it   this-here
          'This here is a fruit of a tree.' (the speaker holding it in his hands)
          (LAM [11])

b.   *Matò a-tòstòs*   *a-róp*   *a-is*   *tar*   *i*
     1.PAU.EX=CAUS-straight CAUS-finish CAUS-return PERF 3.SG
     we=made-straight   made-finish made-return had   it

ap   *matò a-tòstòs*   ***n-ing***   *m'alò*
and 1.PAU.EX=CAUS-straight DEM.NSG-ANA PERS=again
and we=made-straight   that.one   now=again

anu'matòl.
CL:COMM(-3.SG.POSS)=1.PAU.EX
of=ours

'When we had finished repairing it we repaired our own (roof).'
(KAL 2 [13])

2.3   Demonstrative existentials

Demonstrative existentials function as verb phrases and can head a predicate. Like demonstrative determiners and demonstrative pronouns they distinguish between singular and non-singular forms.

Demonstrative existentials consist of demonstrative determiners preceded by a prefix *a-*. In addition to the always complex morphological structure, a difference between verb phrases with a verbal head and those consisting of demonstrative

Table 3. Demonstrative existentials

Singular	Non-singular	Translation	Gloss
a-d-a	*a-n-a*	'is/are here'	PROX
a-d-è	*a-n-è*	'is/are here ☞'	INDX (☞)
a-d-ing	*a-n-ing*		ANA
a-d-óng	*a-n-óng*		CLK
a-d-im	*a-n-im*	'is/are there'	CCLK
a-d-isai	*a-n-isai*		DIST
a-d-ah	*a-n-ah*	'is/are where?'	INT

existentials is that for the latter both subject NP and subject marker are optional if
the referent is clear from the context.

(3) a. *Bèl   dat   tasim ó-n   ép   sip*
       NEG 1.PL know=OBL-3.SG.POSS NPM:COMM ship
       not   we   know=about-it   the   ship

       a-d-ah?
       DEX-DEM.SG-INT
       is-where

       'We do not know where the ship is.' (MAT 2 [71])

    b. *I   ru   ra   nat   lik   **a-n-im***
       3.SG two NPM:DIM.DU child   little DEX-DEM.NSG-down
       it   two   two   children little were-down.there

       ma   an piu.
       PERS at ground
       now   at ground

       'Two little children were outside (on the ground).' (URI [15])

2.4   Locative adverbs

While demonstrative determiners and demonstrative pronouns specify the loca-
tion of an entity, locative adverbs specify the location of an event or state. Locative
adverbs are usually combinations of the locative prefix *t-* and a demonstrative root
(see Table 4). Unlike demonstrative determiners and demonstrative pronouns,
locative adverbs do not distinguish singular and non-singular forms.

Some examples are given in (4).

(4) a. *I   mahlai   i   **t-im**   talang   an mas.*
       3.SG laugh.TR 3.SG LOC-down opposite at shore
       he   laughed.at him down.there opposite at shore
       'He was on the opposite side on the beach laughing at him.' (KAW [14])

b. *I   yél   it   ma   Ø-**sai**   talang*
    3.SG swim PROG   now   (LOC-)DIST opposite
    he   swam continuously now   there-away opposite

    an ló-n   bòn.
    at   mouth-3.SG.POSS sea
    at   mouth-of.it   sea

    'He was swimming there in the sea.' (KAW [12])

Note that the distal locative adverb *sai* is an irregular form: in order to avoid a forbidden syllable-initial consonant cluster **t-sai*, it does not take the locative prefix *t-* (this is also the case for allative adverbs, see Section 2.5). In other demonstrative forms, such as demonstrative existentials (see Section 2.3), the morpheme /sai/ surfaces as the allomorph *-isai,* thus avoiding a disallowed consonant cluster **ds.* This form is not employed in locative adverbs.

Table 4. Locative adverbs

Form	Translation	Gloss
t-a	'do x here'	PROX
t-è	'do x here ☞'	INDX (☞)
t-ing		ANA
t-óng	'do x there'	CLK
t-im		CCLK
Ø-sai		DIST
t-ah	'do x where?/whence?'	INT

Table 5. Allative adverbs

Form	Translation	Gloss
ka-t-a	'towards here/hither'	PROX
ka-t-è	'towards here/hither ☞'	INDX (☞)
ka-t-ing		ANA
ka-t-óng		CLK
ka-t-im	'towards there/thither'	CCLK
ka-Ø-sai		DIST
ka-t-ah	'towards where?/whither?'	INT

2.5   Allative adverbs

Allative adverbs are very similar to locative adverbs, the difference being that the latter specify the location of an event or state, whereas the former refer to the direction of an event or state. Allative adverbs often best translate in to English using the English -*ward*(*s*) suffix. Allative adverbs are based on locative adverbs: they consist of the locative form with the prefix *t*- (or its zero allomorph), and in addition have the allative prefix *ka*-.

Some example sentences are given in (5).

(5)   a.   *Dira inan*   **ka-t-im**   *an bòn.*
          3.DU=go   ALL-LOC-down   at   sea
          the.two=went downward   at   sea
          'The two went down to the sea.' (KAW [8])

   b.   *Matò lós*   *sópén* **ka-t-óng**   *sup.*
          1.PAU.EX=carry pot   ALL-LOC-CLK inside
          we=carried   pots   towards-back inside
          'We brought the pots back inside.' (NINGIN [35])

Like with locative adverbs, distal allative adverbs replace the locative prefix *t*- with zero (*ka-Ø-sai* 'upward' instead of **ka-t-sai*).

2.6   Semantics

Table 1 showed that some demonstrative roots have only one meaning whereas others have up to six different meanings. Their actual meaning in context depends on the deictic centre, also referred to as the *zone of experience* (Florey & Kelly, 2002). We here define the deictic centre as the geographic location, point in time, and personal and social context to which a linguistic utterance is related. Usually, the speaker of an utterance is the deictic centre at the time of the utterance, and all deictic expressions of his utterances are relative to the speaker (see e.g. Rappaport et al., 1989; Duchan, Bruder, & Hewitt, 1995; McIntyre, 2006).

The proximal root -*a* relates an entity to the geographic location of the speaker or his immediate proximity, and translates best in English as 'here' or 'hither'. The semantics of this form are straightforward to define and have also been identified by Ross (2002) and Rowe (2005).

The indexical demonstrative root -*è* is a *pointing-demonstrative* in that it always involves a direct or indirect pointing gesture. A direct pointing gesture means that the speaker employs a part of his body (usually a finger or arm) or a tool (such as a stick) to signal the location or direction of an entity. Indirect pointing gestures are not immediately visible but can be implied. The most typical example here is a context in which a Siar speaker asks a person to follow him or

her. It is then implied that the location or direction relates to the direction of the speaker. An example is (1b). The semantics can even extend to a temporal meaning, in which case the speaker 'points' to a different point in time, in relation to the time of the utterance. Ross (2002, p. 416) does not list the demonstrative root *-è* at all; Rowe (2005, p. 25) interprets it as a demonstrative that either means 'farther away from the speaker' (like a *remote proximal*) or 'close to speaker but distant from addressee'.

The anaphoric demonstrative root *-ing* relates to a geographical location or point in time that has already been established in the context. An example was shown earlier in (2b). Like many other demonstratives, *-ing* also can have a temporal meaning, as in (6).

(6) **Ka-t-ing**   *gau*   *ap*   *k–i*   *parai* *ép*
     ALL-LOC-ANA there and   REAL-3.SG put   NPM:COMM
     from.then.on there and   it   put   the

     gòlòh   *ó-n*   *ép*   *fin.*
     young.coconut OBL-3.SG.POSS NPM:COMM fruit
     young.coconut of-it   the   fruit

     'From then on it bore little coconuts as fruits.' (LAM [31])

The anaphoric demonstrative is quite common in narratives, and it allows other demonstratives with a more concrete reference to be more prominent in the discourse. Ross (2004, p. 117) points out that there is evidence that suggests that an anaphoric demonstrative was already present in Proto-Oceanic, but Ross (2002) labels the Siar form *-ing* "intermediate" instead. According to Rowe (2005), *-ing* refers to a location or direction that is further away than the one represented by *-è*, but still within sight. She also notices its high frequency in narratives. However, I have not found any evidence that suggests that *-ing* does indeed have such a specific meaning.

The clockwise demonstrative root *-óng* has fairly restricted semantics: it has only been observed with a geographical reading (to be discussed in greater detail in the following section); no temporal meaning extension has been observed in the data. An example with a geographical reading was given in (5b). The only semantic extension of this form is the sense *backward*, which has so far only been observed in the context of flipping back book pages (flipping forward would employ the counter-clockwise demonstrative *-im*).[4]

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4.   It may be stated that flipping back pages of a book combines both geographical semantics and temporal semantics, as flipping back pages usually also means going back to a page that was read at an earlier point in time.

In some instances, the counter-clockwise demonstrative root *-im* is the semantic opposite of the clockwise demonstrative root *-óng*. An important difference between the two forms is that in contrast with *-óng*, the root *-im* is semantically highly diverse and does have a semantic extension in the temporal domain. Geographical readings of *-im* include downward movement, movement towards the coast, movement towards New Ireland Province, movement towards the Siar area, and movement along the coast in counter-clockwise direction. We will demonstrate that the latter function is a recent innovation. Since houses in the Siar area are usually built on stilts, leaving a house is also expressed by the demonstrative root *-im*. Even for those houses not built on stilts, such as kitchen houses or shacks, this form is usually used for movement or location outside the house. In the context of flipping pages of a book, *-im* is used for flipping forward. Counter-clockwise *-im* also has a temporal reading that translates best as *until*.[5] An example is given in (7).

(7) *Ép*   *bat*   *i*   *pung* *pas*   *ó-n*   *ép*
    NPM:COMM rain   3.SG   fall   PERV   OBL-3.SG.POSS NPM:COMM
    the   rain   it   fall   finish on-it   the

    kirai *kòbòt*   *sén*   **ka-t-im**   *ó-n*
    day   morning   EMPH   ALL-LOC-down   OBL-3.SG.POSS
    day   morning   all.the.time until   on-it

    ép   *rah.*
    NPM:COMM afternoon
    the   afternoon

    'The rain was falling all the time, from the early morning until afternoon.'
    (KAW [5])

The distal demonstrative root *-sai* is another form that only expresses geographical relations and has no temporal meanings. The first of its two meanings refers to an upward movement or location, which may be short, such as jumping up or climbing a tree, or long in distance, such as a plane taking off or a star in the sky. As for houses, entering a house implies moving up the stairs, and even for those houses not built on stilts, the upward demonstrative is still used when entering. In such contexts of entering and leaving houses, upward *-sai* therefore contrasts with downward *-im*. Since the doors of local houses are not all oriented in the same direction, it is safe to assume that there is no correlation with any movement towards or away from the sea. A second meaning of *-sai* refers to movement away from New Ireland. This movement need not be far: as soon as one's feet touch the water at the beach,

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5. Note that English *until* can in some contexts also be replaced by *down to*.

that person has gone in the *-sai* direction. When moving towards islands, *-sai* is only used for movement from the opposite coast on the New Ireland mainland. When coming from other more remote areas, the demonstrative *-im* is usually used because movement towards the islands is usually also a movement towards New Ireland. Ross (2002) identifies *seaward* as one of the meanings of *-sai*, which is correct only in the case of a seaward movement starting on the coast, but not from inland). Rowe (2005) correctly identifies the *upward* and the distal meaning. She also proposes the meaning *west*, but as the following sections will illustrate, there is plenty of counterevidence against this interpretation.

The interrogative root *-ah* can only be used for unknown locations and is primarily used in questions. This form also has no temporal semantic extension.[6] Neither Ross nor Rowe mentions the interrogative demonstrative.

While in most instances the speaker constitutes the frame of reference, there are contexts with a different centre. One case is boats or ships on the open sea. No matter which direction the boat is heading in, movement to or location at the front of the boat always requires the use of the upward/distal demonstrative *-sai,* whereas movement to or location at the back of the boat requires the downward demonstrative *-im*.
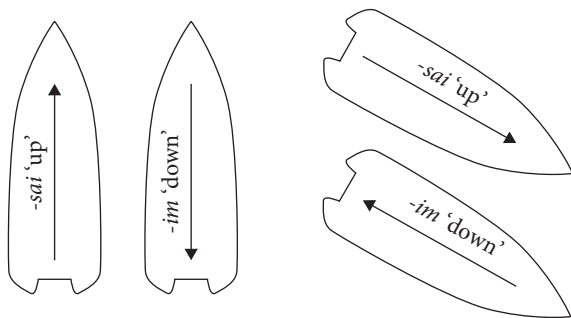
Figure 1. Boats as frames of reference

3. Clockwise and counterclockwise demonstratives

The demonstrative roots *-óng* and *-im* are especially interesting when they are functioning as clockwise and counter-clockwise directionals respectively. In contemporary Siar, the clockwise demonstrative root *-óng* is mostly used to indicate a clockwise direction along the coastline, as shown in the following example.

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6. The formally unrelated temporal interrogative *langsing* 'when?' is mostly used in order to query temporal relations.

(8) *Dira inan*   *Ø-sai an*   *Lamassa* **ka-t-óng**
    3.DU=go   (LOC-)DIST=at PN   ALL-LOC-CLK
    the.two=went up=at   Lamassa   towards.clockwise

    an *Kingén* *sur*   **ka-t-óng**   *an* *Kabóman.*
    at   PN   INTENT   ALL-LOC-CLK   at   PN
    at   Kingén in.order.to towards.clockwise at Kabóman

    'The two went from Lamassa to Kingén to go to Kabóman.' (LAM [5])

This movement demonstrated on Map 2.

Map 2. Tracing the movement in sentence (8)

From the starting point on Lamassa Island in the south, the persons in Example (8) go first to Kingén north of it and then to Kabóman even further north. Given the generally oval shape of the area around Cape St. George (the southern tip in Map 2) they follow the oval in clockwise motion. The starting point on Lamassa Island is encoded with the distal demonstrative *-sai* because the island is considered away from New Ireland, and the sentence was uttered on the coast opposite to the mainland.

Clockwise *-óng* is also used on the east coast of Lamassa Island. Consider Example (9).

(9) *Mara sòi*   *tar*   **t-óng**   *an* *Malum Pirau* *labòng.*
    1.DU.EX=take.off PERF LOC-CLK   at   PN   yesterday
    we.two=took.off had   there.clockwise at   Malum Pirau yesterday
    'The two of us took off from Malum Pirau yesterday.' (INA [1])

The sentence in (9) was uttered in Silur village, further north on the east coast, as shown on the following map:
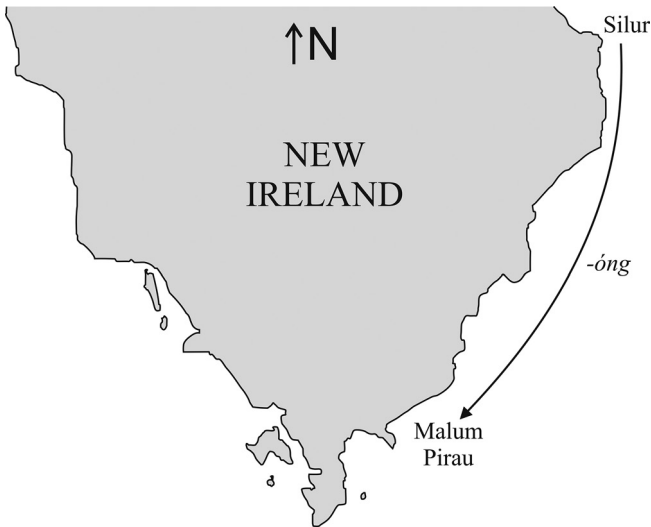
Map 3. Tracing the location in sentence (9)

A difference with *ka-t-óng* in Example (8) is that the clockwise demonstrative is here encoded in the locative adverb *t-óng*, which specifies the starting point of a path, rather than the destination of the movement. In both instances, it does not matter if the path is followed on land or on sea.

The counterpart to clockwise *-óng* is the demonstrative root *-im*, which refers to counter-clockwise motion and also follows the coast on land or on sea. Example (10) encodes the path shown on Map 4.

(10) | *Dat* | *él* | *kaptur* | **Ø-sai** | *an* | *lakman* |
|---|---|---|---|---|---|
| 1.PL.INC | 3.SG-IRR | take.off | (LOC-)DIST=at | village | |
| we | it-will | take.off | away=at | village | |

ka-t-im		*an*	*Lambóm,*
ALL-LOC-CCLK		at	PN
towards.counter-clockwise		at	Lambóm

ka-t-im		*an*	*Bakók,*
ALL-LOC-CCLK		at	PN
towards.counter-clockwise		at	Bakók

ka-t-im		*an*	*Matkamlagir.*
ALL-LOC-CCLK		at	PN
towards.counter-clockwise		at	Matkamlagir

'We will take off from the village (and go) to Lambóm, to Bakók, to Matkamlagir.' (UÒ [124-L])
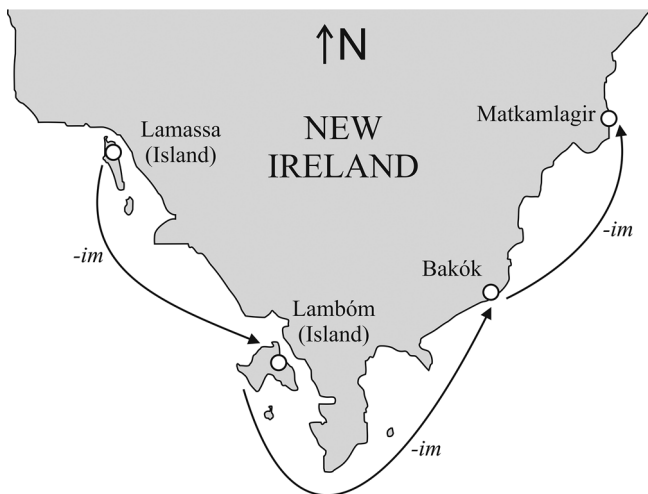
Map 4. Tracing the path around Cape St. George in (10)

Note how on the west coast *-im* is used for movement in a south-easterly direction, while on the east coast *-im* refers to movement in a north-easterly direction. In the very south around Cape St. George, *-im* encodes movement around the cape. Again, the starting point on the island is represented by the distal form *sai* (here in a contraction with *an* as *s'an*).

Clockwise *-óng* and counter-clockwise *-im* are regularly used throughout most of the Siar area. However, both on Lamassa Island and Lambóm Island, the use of the clockwise and counter-clockwise demonstratives deviates from what one would expect.

The situation for Lamassa Island in the southwest is shown on Map 5. As the map shows, the two directionals are used in exactly the same way on Lamassa Island as on the mainland. As a result, directions appear to be inverted: on the island, *-im* refers to a clockwise instead of a counter-clockwise direction or location, and *-óng* to a counter-clockwise instead of a clockwise direction or location. How can this be accounted for? The first important observation is that Siar speakers do not usually walk along the coast of Lamassa Island in a full 360 degree circle. Because the island is too hilly, there is only a relatively small number of houses in the northeast on a narrow flat strip of about 500 meters in length. As a result, people living on Lamassa only move along the coast in the area between the two arrows on Map 5, parallel to the paths on the west coast of New Ireland. Since the western part of Lamassa is not of crucial importance to the island dwellers (except for during the pig hunting reason), there is much more frequent travelling between Lamassa island and the mainland to the east, as well as to Lambóm Island in the south, and therefore it makes more sense to adopt the use of the directionals as they are used on the west coast of the mainland.
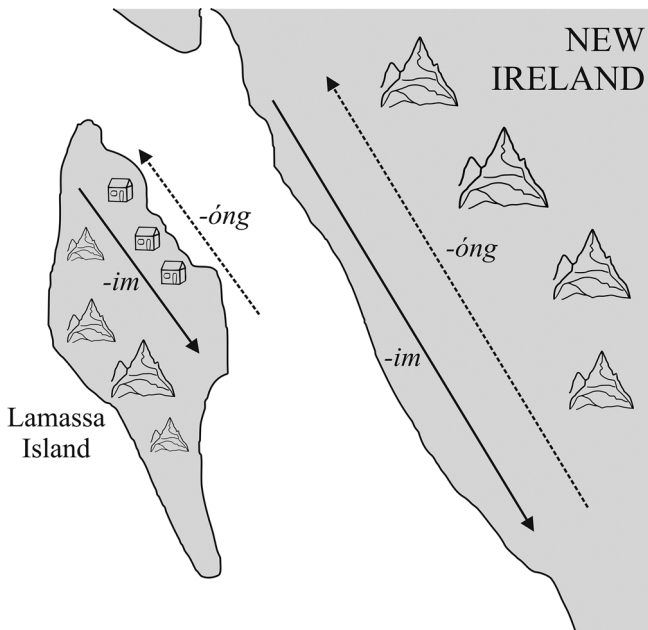
Map 5. Use of the directionals on Lamassa Island

A similar scenario is valid for Lambóm Island further south, of which an enlarged map is given in Map 6.
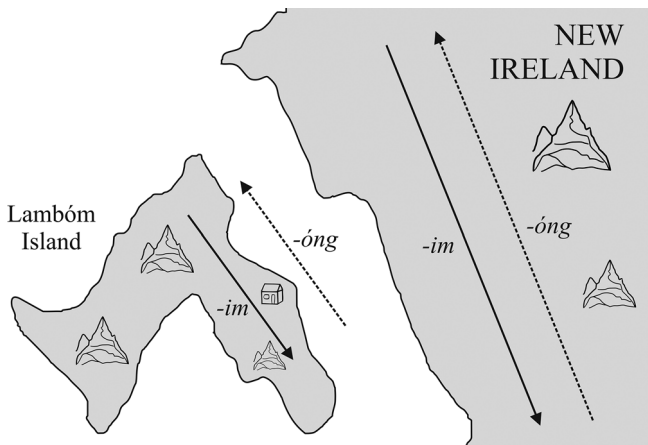
Map 6. Use of the two directionals on Lambóm Island

As on Lamassa Island, people on Lambóm Island do not move around the island in a full circle, but only along the island's east coast, again because the

western part of the island is relatively inaccessible and not suitable for larger villages or plantations. The inhabited area on Lambóm is a relatively narrow strip on the east coast of about 1.5 km. The use of clockwise and counterclockwise demonstratives is exactly the same as on Lamassa Island and on the mainland. Again, we can assert that, because (counter-)clockwise movement around the island is not part of the normal life of Siar on Lambóm, they simply copied the system of the mainland.

When referring to directions outside the Siar area the choice for a clockwise or counterclockwise demonstrative becomes less predictable.
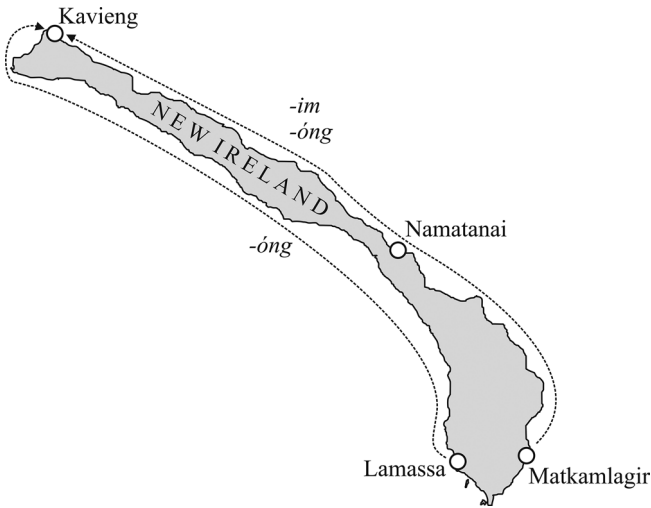
Map 7. Discrepancies when moving outside the Siar area

Map 7 traces movements from Lamassa village on the west coast and Matkamlagir village on the east coast to the provincial capital Kavieng in the north. While for the movement on the west coast only the use of the clockwise demonstrative root *-óng* has been attested, both the clockwise *-óng* and the counter-clockwise *-im* can be used for a northward movement on the east coast. During elicitation sessions, the two paths were indicated with fingers on the map, pointing along the west coast when starting in Lamassa and along the east coast when starting in Matkamlagir. This was done in order to ascertain that consultants did not envision the longer journey along the opposite coast. It is interesting that the use of demonstratives is consistent on the west coast but inconsistent on the east coast, and we will later propose an explanation for this phenomenon. The same discrepancies can be observed for journeys to Namatanai town in the centre of New Ireland, which is the second largest town in the province and, being located on the narrowest part

of the island, reaches both coasts (see Map 8). Movement from Lamassa on the west coast to Namatanai following the west coast route would require the use of clockwise *-óng,* while following the east coast route requires counterclockwise *-im.*
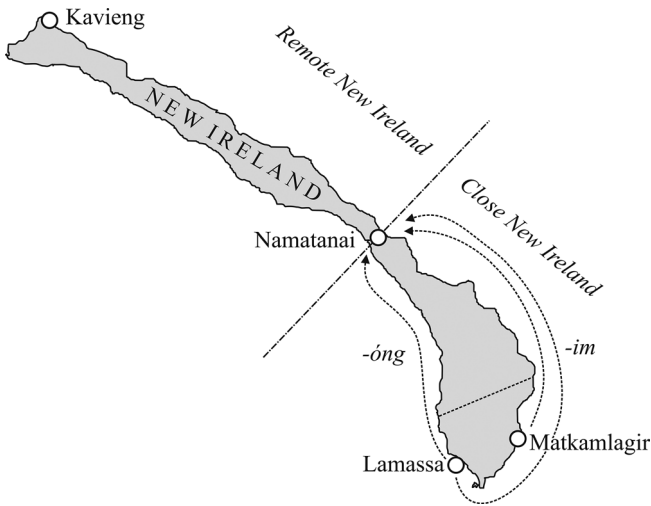
Map 8. The border between close New Ireland Province and remote New Ireland province

Roughly speaking, Namatanai village therefore appears to function as an imagined geographical border separating a 'close' and a 'remote' part of New Ireland. The use of the (counter-)clockwise demonstratives is constant and predictable in Close New Ireland, but inconsistent and unpredictable in Remote New Ireland and everywhere outside New Ireland.

4.　A historical account

As was shown in the previous sections, the Siar demonstrative system is quite complex and frequently occurs in spoken Siar. This section will discuss the history of two of the demonstrative forms, clockwise *-óng* and counter-clockwise *-im*, in more detail. I will demonstrate that the semantic extension to a (counter-)clockwise distinction in Siar is a fairly recent process triggered by the migration of Siar speakers from the east coast to the west coast of New Ireland, which included three stages.

4.1　Stage 0: Proto-Oceanic (1500 BC)

This stage is labelled Stage 0 because at that time Siar did not yet exist as a separate language. François (2004) reconstructs the directional system for Proto-Oceanic

(which was spoken somewhere in the Bismarck Archipelago) and suggests that on land, there was a land-sea axis, combined with an undifferentiated transverse:

*sake
'(go) upward; uphill
towards (middle of) island'

*pano ----------------------------- *pano

'(go) away,
across,
neither up[hill] nor
down[hill]

*sipo
'(go) downward;
downhill toward (deep) sea'
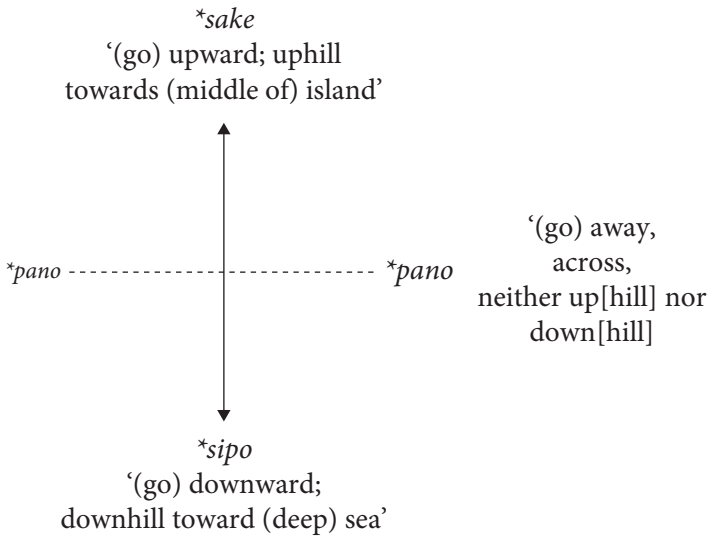
Figure 2. The land-based system of Proto-Oceanic, following François (2004, p. 17)

François assumes that the transverse axis in Proto-Oceanic encoded only a single concept (such as *across* or *parallel to the shore*) which was applied for opposite directions. In some modern Oceanic languages, this transverse coincides with the cardinal axis, meaning that it is parallel to an axis that runs from the southeast to the northwest. At sea, the cardinal axis of Proto-Oceanic corresponds to the direction of the prevailing winds, the northwest monsoon and the southeast trade winds (see Ross, 2003a for a more detailed summary of the meteorological environment).

Palmer (2002, p. 142) illustrates how languages that emerged from Proto-Oceanic adjusted their deictic systems as they settled in areas with new geographic and topological environments. In the following sections we will investigate how this applies to Siar.

4.2   Siar on the east coast (before 1750)

The step from Proto-Oceanic (Stage 0) to Stage 1 stretches over almost 3300 years. Ross, Pawley, & Osmond (2003, p. 2) suggest that the breakup of Proto-Oceanic and the colonization of Island Melanesia started somewhere between 1500 and 1000 BC. Due to the lack of language data for that time it is almost impossible to determine when exactly modern Oceanic languages such as Siar emerged as

individual entities. What is clear is that Siar was a fully developed individual language in 1750, and we will take this year as a temporal mark that separates two developmental stages. Historical accounts lead us to assume that by this time the Siar directional system must have been fairly stabilized, as there were no more critical migration movements after that time. The language boundaries around Cape St. George at that time can tentatively be reconstructed as on Map 9, based on historical accounts such as Stephan & Graebner (1907) and Friederici (1902).
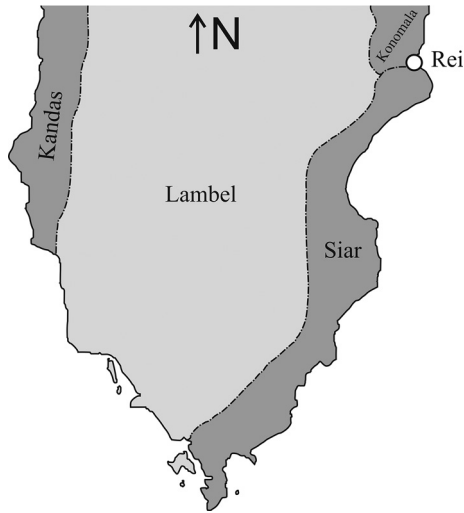
Map 9. Southern New Ireland language borders around 1750

At the time, Siar speakers only occupied the east coast, from Rei in the north to Cape St. George in the south.[7] It is unknown if Lambóm Island of the southwest coast near Cape St. George was already occupied by the Siar at that stage.[8] The two demonstratives -*óng* and -*im* (or their predecessors) presumably specified movement and location along the east coast only. Movement of people happened almost always from the northeast to the southwest. The mountainous interior was usually avoided

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7.   There is no actual evidence that tells us how far to the north the Siar area stretched at that time. We will assume the northern border to be Rei village, as it forms the present-day language border between the Siar language and the Konomala language. Both languages are spoken in Rei itself.

8.   Carteret was the first Westerner to officially anchor in Lambóm in 1767. He found two huts with bananas in them (Stephan & Graebner, 1907, p. 6). No clear information is available as to what language community those houses belonged to, but traditional stories suggest that the Siar were the first people to settle on Lambóm.

because it was mostly occupied by the Lambel people, who were traditional enemies of the people living in the coastal areas. It therefore makes sense that the two demonstratives referred to movement to or location in the northeast (i.e. towards or at Rei village) and movement towards or location in the southwest (i.e. towards or at Cape St. George). This is illustrated in Map 10, which shows a portion of the east coast.
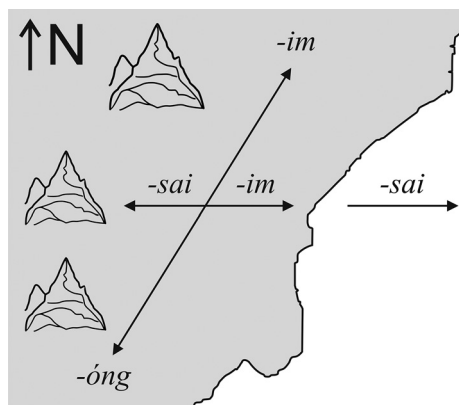
Map 10. The Siar directionals on the east coast in 1750

A straightforward use of a directional is the upward demonstrative *-sai* (from POc *sake*), which can encode landward movement starting from the beach. This is perceptually salient because when going landward one naturally goes uphill (see also Palmer, 2002). Conversely, movement towards the beach, starting from a landward position, is encoded with the downward demonstrative *-im*. Such a correlation is also common in many other Oceanic languages such as Kokota (Palmer, 2002), Vinitiri (Van Der Mark, 2007) and Barok (Du, 2010). An interesting case is the use of the downward form *-im* for movement towards the north(east). François (2004, p. 20) reconstructs a similar situation for Proto-Oceanic, arguing that there is a correlation between moving downward and moving downwind (i.e. following the path of the southeast trade winds). He also correlates the upward demonstrative with movement upwind, but this does not apply for Siar, because here upwind movement (i.e. movement following the northwest monsoon or against the southeast trade winds) is encoded by the form *-óng* and not the upward demonstrative *-sai*. Instead, the upward form *-sai* is used for movement away from New Ireland Province, a situation not found in François' reconstruction. In fact, he proposed the opposite 'probable' option that the downward form was used for movement away from the shore towards the (deep) sea, and that the upward form was used for movement towards the island (François, 2004, p. 17). In Siar it happens to be the exact opposite, and it is plausible to assume that this was already the case in Stage 1.

4.3   Stage 2a: Settlement of Lambóm Island (1750–1900)

In all likelihood the settlement of Lambóm Island was the first Siar migration movement to the west coast of southern New Ireland. Historical accounts suggest that these initial settlements were not permanent but were abandoned a number of times due to a lack of areable soil. The Lambel were mountain dwellers and had no interest in the islands in the southwest, but when the soil on the islands was exhausted, the island dwellers were soon forced to move their gardens to coastal areas on the mainland, where they came under frequent attack by the Lambel people. As a result, almost no Siar villages were on the west coast of the mainland at that time.

It is unknown whether the primary route from the east coast to Lambóm on the west coast was across the mountains in the far south (Path 1 on Map 11) or over the sea around Cape St George (Path 2). The path across the mountains is shorter but much more demanding. Paddling a canoe around Cape St. George was more convenient, but dangerous at times because of the strong currents around the Cape.
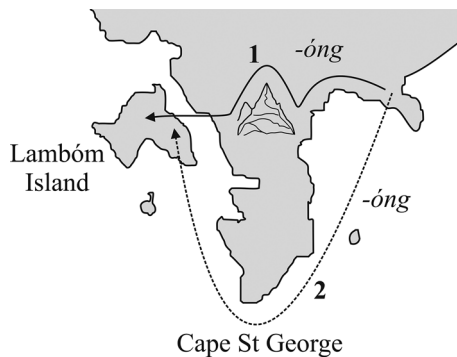
Map 11. Possible paths for the settlement of Lambóm Island, coming from the east coast

Assuming Path 1 to be the primary direction of migration, it would be conceivable to use the demonstrative form -*óng* when referring to movement towards or location on Lambóm Island because Path 1 can be said to roughly follow the southwest direction, which is also the typical direction of -*óng* on the east coast. If we assume Path 2 to be the default path, a question arises. The path from the east coast towards Cape St. George goes southwest whereas the path from Cape St George to Lambóm Island goes north(west). What we know today is that the clockwise demonstrative form -*óng* is used for movement from the east coast or from Cape St. George towards Lambóm Island. It is very likely that this was also the case when Lambóm was first settled, and this raises the question why -*óng* was

preferred over other demonstratives, especially over downward/counter-clockwise
-im. It would have been an option for Siar speakers to use the form *-im* for move-
ment towards the northwest as soon as Cape St. George had been passed, thus
roughly matching the direction of *-im* on the east coast.

If we assume Path 2 to be the primary direction of migration, then we could
say that the reason why *-óng* is used for movement towards Lambóm Island is that
for people travelling in a canoe it is just a little further than Cape St. George but
still roughly in the direction referred to by *-óng* on the east coast (when coming
from further north). This would account for the fact that from Cape St. George
towards Lambóm Island the direction of *-óng* is quite different from its use on the
east coast, so the underlying interpretation could have been something like 'When
we go down to Cape St. George, Lambóm is just a little further, so why use a dif-
ferent demonstrative?'. Path 2 therefore seems to be the one that is more likely to
have shaped the semantics of the (counter-)clockwise demonstratives at that time.

Conversely, movement away from Lambóm Island and towards Cape
St. George and the east coast are likely to have been referred to with the downward
demonstrative *-im*. The main reason might have been that it is simply the opposite
of *-óng* on the east coast, and Siar speakers will have assumed that *-óng* and *-im*
always refer to opposite directions when referring to movement along the coast,
no matter on which coast they are located.

4.4   Stage 2b: Settlement on Lamassa Island (1750–1900)

Historical accounts from explorers and Siar speakers suggest that Lamassa Island
was settled only shortly after Lambóm Island.[9] Settlements on the mainland were
restricted to a single little village opposite of Lamassa Island due to the strong pres-
ence of the Lambel people. The main function of this settlement was quick access
to the taro plantations on the mainland, as the fertility of the Lamassa ground was
limited.

Coming from Lambóm Island in the south, Lamassa Island was accessible
from the sea and via the mainland. It is more likely that the Siar settled Lamassa
Island via the sea, since they would have needed to avoid the enemy on the main-
land. The question here arises which demonstrative form was chosen to refer to
movement towards or location on Lamassa, when coming from Lambóm (and the
opposite direction). Since in contemporary Siar the demonstrative *-óng* is consis-
tently used for that purpose, it makes sense that it was also chosen when Lamassa
was first settled. In addition, *-óng*, which already encoded movement from Cape St.

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9.   A chronological overview of the history of settlement on the southwest coast is given in
Stephan & Graebner (1907, pp. 1–11).

George towards Lambóm Island, could have easily been adopted for movements from Lambóm to Lamassa, which is the same direction around Cape St. George.
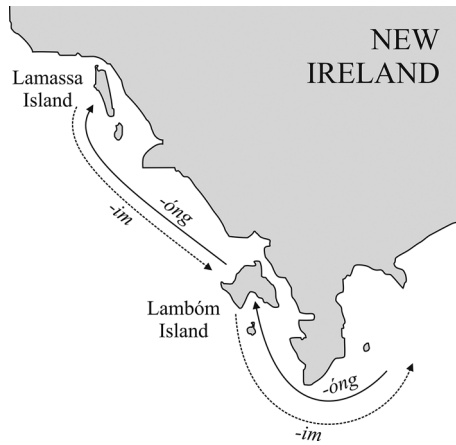
Map 12. A reanalysis of *-im* and *-óng* for movement towards or back from Lamassa

1. 'The direction from Lambóm to Lamassa is the same as the direction from Cape St. George to Lambóm. Why not use the same demonstrative *-óng* then?'
2. 'The direction from Lamassa to Lambóm is the same as the direction from Lambóm to Cape St. George. Why not use the same demonstrative *-im* then?'

The problem of the forms *-im* and *-óng* referring to different directions is amplified here because *-óng* in the area of Lamassa refers to movement towards or location north(west) while *-im* refers to movement towards or location in the southeast, whereas on the east coast *-im* refers to movement to the north(east) and *óng* refers to the southwest. It is therefore clear that a reanalysis of the two forms must have taken place as a result of the migration movement to the west coast.

4.5   Stage 3: Occupation of the southwest coast of New Ireland (1900-today)

Friederici (1902, p. 69) mentions that in the late 19th century the Lambel people were decimated by a dysentery epidemic, and this event seems to correlate with the abandonment of Lamassa Island that Stephan & Graebner (1907, p. 154) report to have occurred sometime between 1875 and 1900.[10]

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10.   James Ridges (p.c.) pointed out that a strong depopulation happened around that time all over New Ireland. Various reasons might have caused this population decrease. It is possible that the contact with whalers could have introduced sexually transmitted diseases and

The shrinking Lambel population would have left a large vacuum in their former language area, which was subsequently filled by the Kandas people in the north and the Siar in the south. This is seconded by Ross (1988: 257), who notes that "the distribution of [Lambel and Kandas] suggests that Kandas […] is the intruder and has occupied the middle of what was once a La[m]bel-speaking strip of coast". The mountainous interior was then completely abandoned; based on the 1979 census, Lewis (2009) estimates the number of Lambel speakers today to be less than 140. The few remaining Lambel speakers have mostly been integrated into villages in the present-day Kandas and Siar speaking area, and Nasko village in present-day Kandas 'territory' (represented by the centre circle on Map 13) is the only place in which Lambel speakers are the majority. Today, all languages in southern New Ireland Province live in peaceful coexistence.

For the Siar, the vacuum triggered a migration wave from the east coast to the west coast, as the disappearance of the Lambel danger allowed for a greater number of plantations on the west coast.
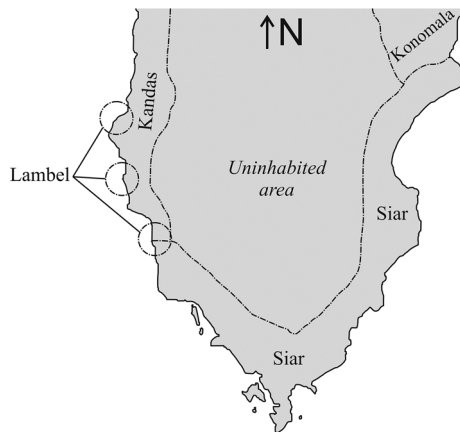
Map 13. Southern New Ireland language areas today

Since this migration wave no other large population movements have happened in the Siar area. The number of villages on the mainland near the coast has increased, but no villages can be found further inland in the mountainous area. As canoes and speedboats are the only connection between east and west coast, both

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other illnesses. Another reason could be the 'export' of young New Ireland people as workers on remote plantations. This is probably less likely to be the cause if we assume the Lambel people lived mostly inland, where they were more difficult to recruit.

coasts have coexisted in relative isolation and this led to the development of two distinct dialects: East Coast Siar and West Coast Siar.[11] The differences between the dialects are minor, as is to be expected after a fairly recent migration, but like the (counter-)clockwise directionals, the emergence of the two dialects can be considered a result of the migration.

While today's use of the demonstratives *-óng* and *-im* is consistent along the west coast (all the way up to the provincial capital Kavieng in the north), east coast dialects show some inconsistency in the use of demonstrative forms for movements out of the Siar area towards Namatanai or Kavieng in the north. We can assume that on the east coast the old semantics of the demonstratives *-óng* and *-im* (i.e. the *towards-Cape-St.-George* and the *towards-Rei* semantics) are still perceived by older generations, whereas the younger generation seems to have fully adjusted to the new (counter-)clockwise analysis as a result of increased mobility.[12]

It is clear from the account above that the semantics of the (counter-)clockwise demonstratives *-óng* and *-im* are convoluted. This is evident when looking at the analysis of other linguists. Ross (2002) does not identify the demonstrative *-im* at all and defines *-óng* as a distal form. Rowe (2005) concludes that *-im* refers to 'down, south or east' whereas *-óng* means 'north, further away but still visible'. For both assumptions we have seen counterevidence: Map 6 and Map 7 show that *óng* can refer to locations close by (it is used on two small islands) and hence is not distal. Example (9) shows that *-óng* does not necessarily refer to the north, and Map 8 illustrates that *-im* is not always south or east.

5.   An etymological account

Although we assume in this article that the clockwise/counter-clockwise distinction in Siar is a fairly recent innovation that resulted from the westward migration, it still makes sense to look at the etymology of the present-day demonstratives by studying their cognate forms in other languages. We will here focus only on the clockwise demonstrative *-óng* and the counter-clockwise demonstrative *-im*.

The most likely Proto-Oceanic ancestor for the clockwise demonstrative *-óng* is Proto-Oceanic **toŋa* 'southeasterly quadrant, southeast wind'

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11.   This is actually a slight overgeneralization because the west coast dialect also includes some of the southern villages on the east coast.

12.   This requires further structured and more detailed elicitation with all age groups.

(Ross 2003a: 136–137). What is very unusual about this etymon is that obvious reflexes of this form only seem to be found in Polynesian languages further east, where they are free morphemes. However, the semantics of this proto-form nicely match our assumptions about the meaning of Siar *-óng* before the westward migration: in that period *-óng* referred to movement towards Cape St. George, which is in the south. This is similar to other Polynesian languages in which the form *toŋa* refers to the south only (e.g. Tuvalu, Maori and Western Futunan), usually as a noun.[13]

Likewise, the counter-clockwise demonstrative *-im* is probably related to Proto-Malayo-Polynesian **timuR* 'south or east wind; wind bringing rain; rainy wind from southeast' and its Proto-Oceanic derivate **timu(R)* 'wind bringing light rain' and, probably, Proto-Western-Oceanic **(s,t)imuR* 'island'. Obvious cognates are found primarily in Western Oceanic languages and Austronesian languages of Indonesia. The Siar row in Tables 6–8 shows how Siar speakers could have reinterpreted the proto-semantics if the proto-form was indeed the underlying one.

Table 6. *-im* as a derivate of PMP **timuR* (reconstruction taken from Ross, 2003a, p. 135)

Proto-Malayo-Polynesian	**timuR*	'south or east wind; wind bringing rain; rain wind from southeast'
Belau _{WMP}	*ðimas*	'south wind'
Tagalog _{WMP}	*timog*	
Bilaan _{WMP}	*timul*	'south'
Malagasy _{WMP}	*a-tsimu*	
Aceh _{WMP}	*timu*	
Indonesian _{WMP}	*timur*	'east'
Sasak _{WMP}	*timuq*	
Buru _{CMP}	*timo*	
Siar _{MM}	*-im*	**'following the southeast trade winds'**

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13. We could take this analysis even further by assuming that the Siar locative prefix *t-*, which often precedes the (counter-)clockwise directionals, is a reflex of the alveolar plosive /t/ in the proto-form.

Table 7. *-im* as a derivate of POc **timu(R)* (reconstruction taken from
Ross, 2003a, p. 136)

Proto-Oceanic	**timu(R)*	'wind bringing light rain'
Takia _{NNG}	*tim*	'wind'
Ali _{NNG}	*tim*	'dew'
Motu _{PT}	*si-simu*	'light shower'
Tongan _{PLY}	*jimu-jimu*	'heavy blowing; almost a hurricane'
Samoan _{PLY}	*timu*	'be rainy; rain'
Anutan _{PLY}	*timu*	'light rain; drizzle'
Ramoaaina _{MM}	*timtim*[14]	'drizzle; of rain'
Siar _{MM}	*-im*	**'following the wind/rain' (?)**

Table 8. *-im* as a derivate of PWOc **(s,t)imuR* (reconstruction taken from Osmond, Pawley, & Ross, 2003, p. 43)

*PWOc	**(s,t)imuR*	'island'
Muyuw _{PT}	*sim,* *simulan*	
Iduna _{PT}	*himula*	
Dobu _{PT}	*simula*	'island'
Kiriwina _{PT}	*simla*	
Sursurunga _{MM}	*sim*	
Siar _{MM}	*-im*	**'away from Lambóm Island'** **'towards the Tangga Islands'** **'towards where the islanders (Tangga) live on the east coast'**

Going from Tables 6–8 we go further down in the language family tree, which could suggest that the scenario in Table 8 is a more likely one because it includes the most closely related languages, but of course there are various other factors that would have to be taken into account as well.

The scenarios in Tables 6 and 7 are very similar, both suggesting that the original meaning of counter-clockwise *-im* is related to the direction of the wind or the rain. This conforms to the idea in François (2004). However, it is doubtful that Proto-Oceanic **sipo* 'go downward' is a cognate of the Siar downward demonstrative root *-im*. It is more likely to be related to Siar *sup* '(go) inside', which, like the

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14.   In Ross (2003a, p. 148) the form is represented as *rim-rim*.

Proto-Oceanic form, is also used to refer to the going down (i.e. 'going inside') of the sun and moon. PMP *timuR* and POc *timu(R)* are therefore the most likely sources of the Siar demonstrative root *-im*. This suggests that in the early stages of Siar, movement or location in *-im* direction corresponded with the southeast trade winds or the rain that is associated with them, and that at a later stage, the demonstratives were reanalysed to match the geographic and topographic particularities of the Siar region.

The scenario in Table 8 could suggest that downward/counter-clockwise *-im* is somehow related to the location of an island. There are only two islands or groups of islands that could have been an anchor point for the east coast: Lambóm Island in the southwest and the Tangga Islands in the northeast. If *-im* were anchored to Lambóm Island, then it would follow that Lambóm Island was known and settled by the Siar at an early stage already. If this were the case, then *-im* is likely to have referred to movement away from or location away from Lambóm Island (note that the opposite direction was represented by *-óng*). However, this is the most unlikely of the three options discussed here.

Another option would be to assume that movement in *-im* direction referred to movement towards the Tangga Islands in the northeast.
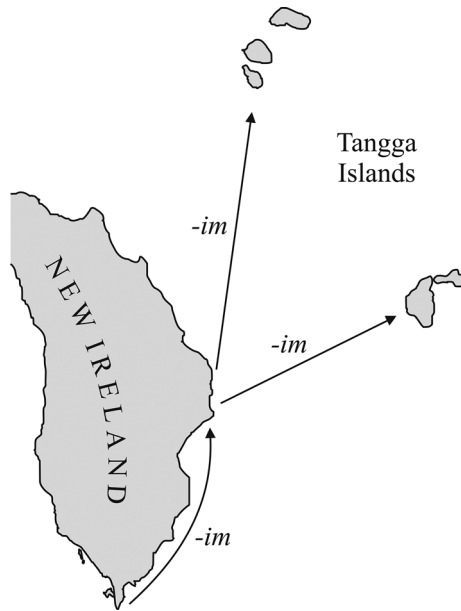
Map 14. *-im* referring to movement towards the Tangga Islands?

The problem with this assumption is that the Tangga Islands are too far away from the Siar area (about 56 kilometres), and it is much more likely that the

distal/upward demonstrative *-sai* was used for this direction, as it is used today. There are also some smaller Tangga communities who live on the east coast of southern New Ireland Province, but these are located between the Konomala area and the Sursurunga area to the north of Siar, and hence it is less conceivable to assume that *-im* could also have meant something along the lines of 'in the direction of where the Tangga islanders live'.

Alternatively, we could assume *-im* to be a Siar-internal derivate that is not related to any of the proto-forms because this form can also be said to be a grammaticalization of the verb *pirim* 'move down; descend'. Note that when going from the mountains towards the coast one naturally moves downward, in which case *-im* would also be employed, and the verb that refers to this movement would usually be *pirim*, as in the following example.

(11) *pirim   ka-t-im   an bòn*
       descend ALL-LOC-down at sea
       descend downward   at sea
       'go down to the sea/beach (coming from the mountains or inland).'

An important observation is that whereas the Siar demonstratives *-im* and *-óng* are bound roots, all the putative cognates in Tables 6–8 are free forms and mostly nouns. This might be further evidence for the assumption that, at least in the case of *-im*, the source may have been the verb *pirim* 'descend; move down'.

We can therefore summarize that for *-óng*, the most likely etymon seems to be POc **toŋa* 'southeasterly quadrant, southeast wind', whereas for *-im* there are three conceivable options: one relating to the winds, one relating to one of the islands (presumably Lambóm) and one relating to the verb 'move down' or 'descend' (*pirim*). All three options are somewhat plausible, making it difficult to reconstruct the original meaning of *-im* (and, subsequently, *-óng*) when Siar was only spoken on the east coast, before the (counter-)clockwise distinction arose.

6.   Other (counter-)clockwise systems

(Counter-)clockwise systems are typologically uncommon. So far, only three Austronesian languages have been attested to make this distinction:

–   Manam   Western Oceanic, Papua New Guinea (Lichtenberk, 1983)
–   Boumaa Fijian   Central Eastern Oceanic, Fiji   (Dixon, 1988)
–   Makian Taba   Malayo-Polynesian, Indonesia   (Bowden, 2001)

The geographic situations for Manam and Makian Taba are very similar to each other. Both languages are spoken on an almost perfectly circular volcanic island, with a slope from the volcano in the centre of the island down to the shore. This means that movement on the island typically involves following the coast rather than going across the volcano.
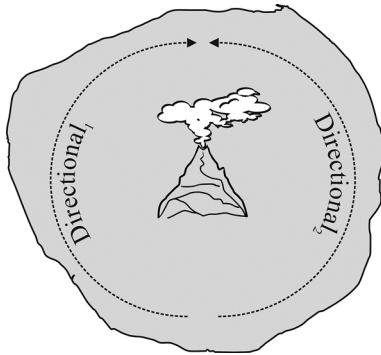
Map 15. Directionals on some circular volcanic islands

The situation on Taveuni Island, where the Boumaa dialect of Fijian is spoken, is slightly different. The island is also volcanic and has a mountainous interior, but it is not perfectly circular.
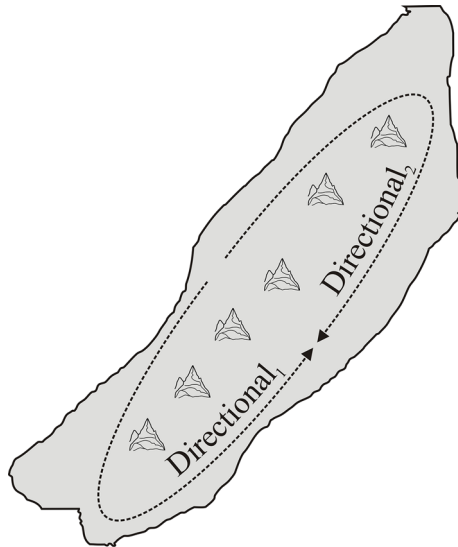
Map 16. Directionals in Boumaa Fijian (Taveuni Island, Fiji)

Here as well, movement on the islands is usually limited to following the coast in either direction because of the impenetrable interior.

A crucial difference between these three languages and Siar is that Manam, Makian Taba and Boumaa Fijian are the only languages spoken on their respective islands. This is not the case for Siar, which is one of 15 languages spoken on New Ireland, not including Tok Pisin and languages on nearby islands. We argued that the (counter-)clockwise distinction works well *within* the Siar area, and in its immediate geographic neighbourhood, but inconsistencies first emerge when moving further away from a core geographical area, beyond Namatanai in central New Ireland.

Another important difference with the other languages is that the scope of Siar (counter-)clockwise directionals does not in principle make up a full 360 degree circle or oval. This is because in the northern part of the Siar area people cannot easily travel from the west coast to the east coast and vice versa directly, but have to go around Cape St. George. Still the Siar (counter-)clockwise directionals can be used in exactly the same sense as in the other languages (as if such a movement were possible and common), hence practically making the oval a full one. In this light, not being the only language in a geographically isolated area such as an island does not rule out the emergence of a (counter-)clockwise distinction.

What is similar for all four languages is that the frame of reference is restricted with regard to the (counter-)clockwise distinction (Lehman & Gerdrich, 2002, refer to such restricted areas as containers). With regard to the semantics of the Siar (counter-)clockwise demonstratives, we can imagine the Siar area as an isolated area like on the following fictional map, in which the Siar area is cut off from the rest of New Ireland at the north, as if it were a separate geographical entity (see Map 17).
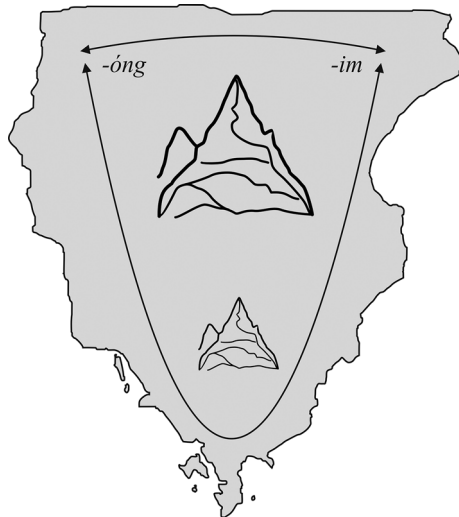
Map 17. A fictional map of Siar as an isolated geographical entity

7.   Conclusion

In this paper I present a hypothesis of how the (counter-)clockwise distinction in Siar directionals emerged. I argue that this distinction is a fairly recent phenomenon which was shaped through a number of distinct stages:

– *Stage 0* (1500 BC): A subset of the Proto-Oceanic directionals relate to the directions of the prevailing winds.
– *Stage 1* (before 1750): Siar is only spoken on the east coast. Originally wind-related directionals refer to movement at or location towards the north and northeast (presumably Rei village) and south and southwest (Cape St. George).
– *Stage 2a* (1750–1900): Siar settle on Lambóm Island on the west coast. Movement from Cape St. George to Lambóm is represented by *óng*. Movement from Lambóm to Cape St. George is represented by *-im*.
– *Stage 2b* (1750–1900): Siar settle on Lamassa Island on the west coast. The use of the demonstratives for location at or movement towards Lambóm (and the opposite direction) is extended to Lamassa. As a result, *-im* and *-óng* refer to very different directions on both coasts.
– *Stage 3* (1900-today): Consistent use on both coasts within Siar area and in Close New Ireland. Inconsistent use when outside Siar area and in Remote New Ireland.

Siar is unusual in that it has developed a (counter-)clockwise distinction even though it is not a language on an isolated roundish island.

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Types of spread zones

Open and closed, horizontal and vertical

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Spread zones are areas where any resident language is likely to spread out widely, so overall linguistic diversity is low at any time (though over time different languages spread out, giving the area a diverse diachronic profile). This chapter subclassifies spread systems into four types: (1) mountain ranges, where languages tend to spread uphill gradually; (2) altiplanos, upland closed spread zones where the distinctive climate and ecology require special adaptation and a language, once established there, is hard to dislodge, and descendants of the first language in tend to undergo later spreads, giving the altiplano a very low diversity profile even diachronically; (3) lowland open spread zones, where a language can enter from any direction and any entering language has some chance of spread, so structurally and genealogically different languages spread over time and give the zone a diverse profile diachronically; (4) lowland closed spread zones, where natural or other barriers make entry difficult; here the history of spreads is rather like that in altiplanos.

1. Introduction

A spread zone, as defined in Nichols (1992, pp. 13–24, 1997), is an area where from time to time one language spreads out widely, absorbing or displacing others, with language shift typically being the main mechanism. Thus for a language entering a spread zone there is a good chance of extinction in the next spread and a smaller chance of becoming the next spreading language itself. The ultimate causal factor responsible for the pattern of repeated spreading is geography – climate, latitude, rainfall, vegetation – of a kind that favours sizable societal territories and long-range connections among societies. Dry and/or seasonal climates, relative ecological monotony (as with a topography lacking such features as mountains and seacoasts that offer a variety of ecologies), sparse or patchy resources, and

higher latitudes encourage language spreading. Only where resources are varied and abundant enough that a society can be self-sufficient in a small territory do we find high linguistic diversity and a general lack of large spreads. Since the causes are geographical a spread zone is a fairly stable phenomenon, and successive spreads over time can reduce linguistic diversity in the spread zone itself and in the surrounding vicinity.

The best-known spread zones, such as the Eurasian steppe or the North American subarctic interior, are fairly flat places. The reason for this is not that language spreading uphill and downhill is less easy than horizontal movement; a language spread is not a cycling race but chiefly a matter of language shift, so the physical effort involved in climbing is irrelevant.[1] Rather, relatively level landscapes such as arctic tundra and mid-latitude steppe have the low ecological diversity that contributes to language spreads. Languages easily spread uphill, and in fact in most economic situations uphill language spread is natural and indeed almost inevitable at least in the long run.

Spread zones are not all alike, and this chapter seeks to taxonomize them and proposes terminology in order to improve our ability to raise cross-linguistic hypotheses about the relationship between spreading and grammatical structure.

2. Mountains: Vertical spreads

Essential to ethnolinguistic survival and continuity in mountain areas is distributed verticality: a successful society takes advantage of the variety of climate and ecological zones to be found at different altitudes. That variety means that a society can survive in a smaller territory than it would require in the more homogeneous lowlands, and therefore ethnolinguistic diversity is generally higher in mountains.

2.1 Central crest

A central crest mountain system is one like the Rocky Mountains, the Alps, or the Caucasus: in the center of the area are the highest highlands, often uninhabitable because they are permanently under snow and ice. Even if not permanently snow-covered, highlands are economically productive for only a small part of the

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1. In fact in mountain areas the main forms of economic intercourse – travel to and from markets, summer vs. winter pastures, and lowland urban centers – are vertically rather than horizontally arranged and typically involve travel up and down river canyons rather than laterally across slopes. This is because the economic centers draw on the ecological and economic variety that altitude fosters, as is discussed again below.

year because of the short growing season at high altitudes. The highest highlands are surrounded by seasonally productive highlands and foothills, which are surrounded by lowlands with a longer growing season. Highland populations in such areas are generally smaller than in the foothills and lowlands, economically specialized (typically in herding), and economically dependent on the lowland markets and winter pastures. They are often transhumant or partly transhumant, with part or all of the society moving between highland summer pastures and lowland markets and winter pastures.

The eastern Caucasus, and specifically the republic of Daghestan, is an area of high linguistic diversity and sharp typological divergence from the rest of western Eurasia (See Map 1).[2] It is also probably the clearest and most extreme example of verticality effects in transhumant societies. The permanent towns are in the highlands, and language and ethnic identity are centered there. Traditionally these towns were autonomous city-states. Highland towns cannot sustain their entire population on their own lands. The working-age male population spends only the summer part of the year in those towns, and the rest in the lowlands where they rent winter pastures and/or take seasonal jobs; some highlanders own businesses in the cities and larger lowland towns. Some highlanders maintain a second household and family in the lowlands. In the summer they tend livestock, fields, and gardens in the highlands. They are bilingual in their own ethnic language and the language of their winter work, but lowlanders never learn highland languages. In the highland villages, the local highland language is spoken almost exclusively, though most people know one or more foothill and/or lowland languages. The towns are organized into clans, and the preferred marriage is clan endogamous on both sides, so very few people marry into other towns. The highest highland languages are therefore in almost total sociolinguistic isolation (as that is defined by Trudgill, 2011), with virtually no adult learners of the languages and certainly not enough to have impact on the structure of the language. Grammatical complexity and opacity are high in highland languages as they are learned only by child first-language learners, who easily master complexity. Highland languages include a number that are spoken only in one town, the logical consequence of autonomy and sociolinguistic isolation.

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2.   Here and below I use the ethnographic present to describe an economy and sociopolitical organization that was badly disrupted in the 19th and 20th centuries and is now changing rapidly. The overview of linguistic geography, economy, and sociolinguistics in the Caucasus is based on Aglarov (1988), Karpov & Kapustina (2011), Nichols (2004, 2011a, 2012b, 2013) and Wixman (1980). Language classification and maps are in Korjakov (2006).
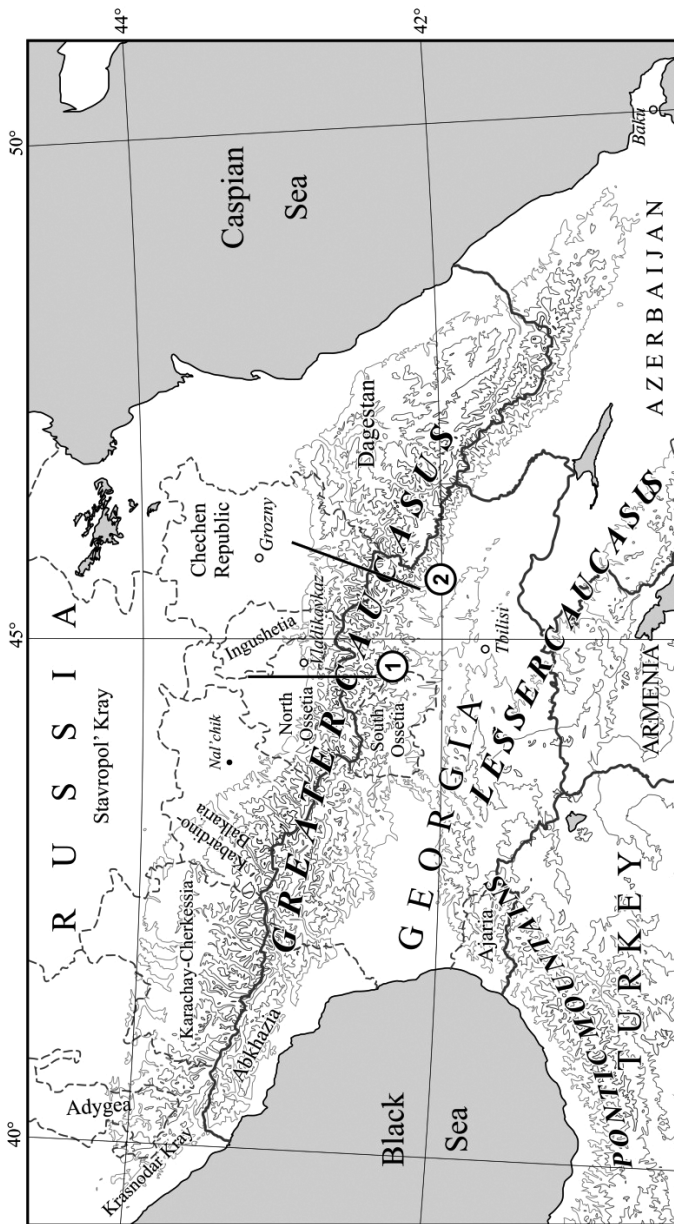
Map 1. The Caucasus (① Approximate historical eastern limit of the Nakh-Daghestanian language; ② Approximate boundary of central and eastern Caucasus ecologies)

Because of the asymmetrical vertical bilingualism, there is always some chance that a lowland language will spread uphill, but almost no chance of the reverse. (Highlanders from the same clan or town tend to live and work together in the lowlands, and some settle there permanently, but those who settle permanently usually shift to the lowland language after two or three generations.) The influential lowland language Avar has spread into formerly Andic-speaking lands along the lower Andi Koisu, as shown by etymologically Andic place names in current Avar-speaking lowlands (Aglarov, 1988), and some highland towns on the upper Andi Koisu have also shifted to Avar (see Korjakov, 2006, Map 11). Other examples of uphill spread are reviewed below.

The gradual uphill spread of lowland languages along river canyons produces what can be called *Burushaski distributions*, named for the Burushaski language isolate in the western Himalayas. Burushaski is spoken in two dialect forms on adjacent mountains along separate valleys of tributaries of a single river (see Map 2). The lowland language at both valleys and below the confluence is the Indo-Aryan language Shina, a known relative newcomer, as is clear from the general nature of the Indo-Aryan spread and also indicated by evidence of grammatical influence of Burushaski on Shina.[3] The Shina spread removed a once-continuous Burushaski lowland presence, truncating the Burushaski territory and isolating the two dialects from each other.

An example of a Burushaski distribution in the Caucasus is the geography of the Avar-Andic-Tsezic branch of Daghestanian. The branch is impressionistically of somewhat greater diversity and apparent age than Germanic; its Avar-Andic sub-branch is younger and consists of the very close-knit Andic group plus the more divergent Avar. The Tsezic branch has a Burushaski distribution with its eastern branch on the uppermost Andi Koisu and its western branch on an upper Avar Koisu tributary. It is cut off in its lower range by the Andic group, which itself has a Burushaski distribution: most of the languages are spoken along the Andi Koisu but the more divergent Akhvakh dialect group is along the middle Avar Koisu. Extending across both rivers and their confluence is Avar (see Figure 1). The prehistory that can be read off of this double Burushaski distribution is a Proto-Avar-Andic-Tsezic spread uphill along both rivers beginning perhaps 3000 years ago, followed by a

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3. The exact sociolinguistics of the contact is in dispute. Lorimer (1937) and, following him, Thomason & Kaufman (1988, p. 139) see the influence as indicating shift from Burushaski to Shina; (Ross, 1997, p. 247) sees it as metatypy due to bilingualism where Burushaski was the influencing language. Either scenario is plausible: a Burushaski substratum reflecting shift to Shina as the latter moved upriver in the lowlands, or Burushaski as a former inter-ethnic language in the lowland towns and markets in which Shina speakers originally participated as outsiders and only later came to dominate sociolinguistically.

Map 2. Current and former range of Burushaski (northern Pakistan)
Source: Wikimedia.
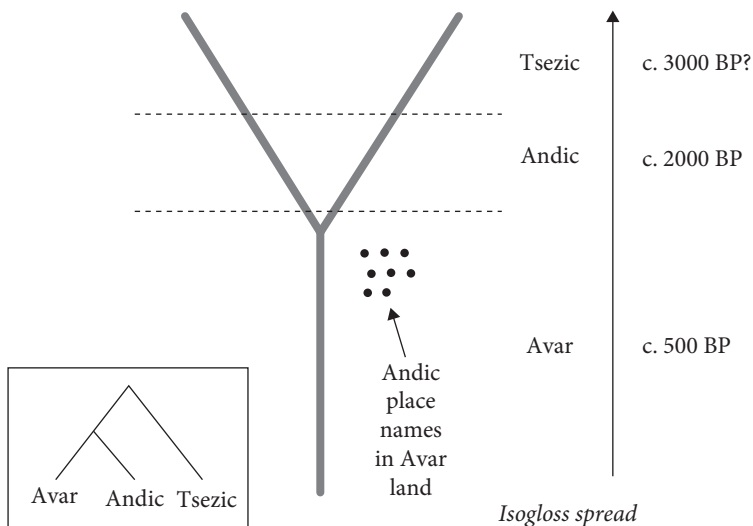
Figure 1. Schematic view of the Avar-Andic-Tsezic distribution in the eastern Caucasus. (Inset: family tree. Dates at right are approximate times of the three spreads from the present Avar lowlands.) The "Y" shape is the Sulak and its two tributaries.

second spreading phase by Proto-Avar-Andic beginning perhaps 2000 years ago, and a third phase, the Avar spread, beginning perhaps 500 years ago. Each spread removed what must have been intermediate languages and dialects, producing

the discrete Avar, Andic, and Tsezic subbranches. The relative chronology of these spreads accounts for the geography as well as the relative levels of diversity in the branch. The entire history amounts to three pulses in what must have been a continuous pattern of uphill spreading from the same general lowland or foothill area.

Another Burushaski distribution is exhibited by Rutul of the Lezgian branch in southern Daghestan. It is spoken in the valleys of the upper Samur and the mid and upper Axtychai, cut off at the confluence by Axty Lezgi varieties (Korjakov, 2006, Map 13). Lezgi is a large and important language spoken in the Samur delta and nearby in a sizable plain along the Caspian coast; it also extends well into the highlands along the larger rivers. Rutul is a fairly distant sister of Lezgi, but to judge from the linguistic geography it must have originated in a much earlier spread that also emanated from the lower Samur area.

An incipient Burushaski distribution is shown by Aghul and Tabasaran, close sisters of Lezgi (the three languages comprise the East Lezgian subbranch). Aghul is spoken mostly along the upper Chiraghchai (an ultimate left tributary of the Samur) and Tabasaran occupies a short stretch of the middle Chiraghchai but is mostly to be found along the Rubas, a separate river that flows into the Caspian Sea north of the Samur delta. A likely prehistory is a spread of Proto-East Lezgian up both rivers, followed later by a spread of Lezgi chiefly up the Samur. (Between these two events, Azeri, a Southwest Turkic language, spread along the Caspian coast from the south of the Samur, narrowing the Lezgi range near the coast and bypassing it to spread well to the north and eventually meet up with Kumyk, a Northwest Turkic language spreading southward from the steppe.)

A much earlier spread of ancestral core Lezgian has left more distantly related Lezgian languages in an arc around East Lezgian: to the west, Rutul and Tsakhur on the uppermost Samur tributaries; to the northwest and at a distance, Archi, probably via spillover from the uppermost Samur to the uppermost Risor (a Karakoisu tributary, ultimately flowing to the Avar Koisu in the north); to the south, Kryz and Budux on the upper Kudialchai and Karachai, which flow into the Caspian well south of the Samur. Kryz and Budukh are now receding enclaves whose speakers are shifting to Azeri.

A still earlier spread of greater Proto-Lezgian has left two isolated and highly divergent Lezgian languages as peripheral enclaves: Udi, now spoken in two towns in Azerbaijan and a recently formed outpost in Georgia, but in the first millennium CE an important language in use over most of the Alazani valley and the left Kura basin in the southwestern lowlands; and Khinalug, spoken in an eponymous enclave above Kryz on the Kudialchai well to the south of the main Lezgian mass.

The Samur delta and the nearby Caspian coastal plain is a natural center of language spreads. This is the only wide place in the coastal plain along the eastern flank of the Caucasus. To the north is the narrow point at Derbent, a natural bottleneck that has served as an easily defended taxation point since antiquity; to the south

another narrow point leads to ancient Shirwan, modern Baku, and thence to Iran. The area has agricultural advantages: adequate rainfall (including summer rainfall), a number of rivers, and rich soil (it is at the southern edge of the black soil zone). The canyons of the several rivers permit uphill spreading at several different points, encouraging diversification into more numerous and more divergent daughter branches than is the case with the Avar-Andic spread center. Along the coast are cities that have been important since antiquity, among other things as trade and business centers for the transhumant male population of much of the eastern Caucasus. The cities have long been multi-ethnic, with not only Azeri and Daghestanian linguistic populations but also Armenians and speakers of Tat, an Iranian language which dominated the coastal cities in the first millennium BCE. They have long been multi-religious, with (in chronological order of addition to the mix) Zoroastrian, Jewish, Christian, and Muslim populations (see Wixman, 1980, pp. 698–669). There is a long history of kingdoms in the area, mentioned in historical sources. Prior to the spreads of Iranian and then Turkic languages to this region, it can only be assumed that the main linguistic element was Nakh-Daghestanian, and that the same dynamic that drew and pushed Lezgi uphill in recent centuries has been producing Lezgian spreads for millennia. The more general vicinity of the southeasternmost Caucasus is the presumed Nakh-Daghestanian homeland as well. In short, the area is a standing center of uphill language spreads.

Uphill spreads are often gradual, like most of those that have given rise to Burushaski distributions, but in addition there are cases of non-gradual uphill expansion. The highest inhabited areas at two points along the western edge of Daghestan have sizable Avar enclaves: a first overhangs the Tsezic languages at the far southwest, a second the Andic languages in the west at the Andic-Chechen frontier. Both of these enclaves belong to the northern dialect, the same dialect as is spoken on the lower Andi Koisu. In a similar pattern along the Avar Koisu, the Ratlub dialect of Akhvakh (Andic) is spoken at the confluence with a tributary, and an Avar enclave is upriver (Korjakov, 2006, Map 11). These cases of leapfrogging show that uphill language spread can be saltatory, and they suggest that the highest highland settlements are most susceptible to language shift. This is plausible, as their sociolinguistic isolation is extreme, their growing season is the shortest of all, and their economies are the most marginal and the most dependent on lowland markets.

Another overhang is on the south slope in Azerbaijan, where the Kusur dialect of Avar is spoken above Tsakhur on the uppermost Samur (Korjakov, 2006, Maps 10, 13). The Kusur dialect is phylogenetically closest to the Zakatala dialect on the south slope, which implies that it may have arrived on the upper Samur via uphill spread; but it could also have been part of the same spillover process that brought the Zakatala dialect to the south slope in the first place.

While highland towns are autonomous city-states, sociolinguistically isolated, and in the upper highlands often speak one-town languages, in the lowlands one language generally occupies a larger territory, has more speakers, and is spoken in several towns. Because of its larger range it can spread uphill in more than one place. Avar, for instance, has spread all along the Avar Koisu and partway up the Andi Koisu. In the long run, the spread of one lowland language uphill in more than one place can reduce genealogical diversity in the foothills and highlands. On the other hand, diversification continues in the highlands, so that the two processes of diversification and spread may balance each other out. It is notable that in most of Daghestan the highland languages fall into branches of more or less Romance-like diversity: these include Tsezic, Andic, Dargwa, and Samur Lezgian. Only in the far southeast, where the very divergent Lezgian languages Khinalug, Budukh, and Kryz are spoken, is the local time depth considerably greater than Romance-like. The internal ages of these various branches may ultimately suggest something about the rates of diversification and spread. Meanwhile the time depth between the major branches of Nakh-Daghestanian is very great, probably of at least Indo-European-like age, indicating that the initial spread of ancestral Nakh-Daghestanian began several thousand years ago.

The lowlands are the centers of spread of languages, and they are also the centers of diffusion of loan vocabulary and cultural and economic advances. The same big lowland language often functions as center of diffusion to more than one foothill and highland language or language family. As a result, in a central crest mountain area the literal geographic periphery – the surrounding lowlands – acts as the linguistic-geographical center of innovation, while the literal geographic center – the highest highlands – acts as the periphery. That 'periphery' is genealogically and typologically diverse and preserves archaisms, just like the literal periphery of a classic dialect zone.

The examples of Burushaski distributions reviewed above depicted the ancestral Avar-Andic-Tsezic and Lezgian protolanguages as spreading from the lowland centers of innovation. Another such is likely to have been ancestral Dargwa, spreading from the foothills north of Derbent (i.e. north of the Lezgian languages). Within each of these groups, languages remaining from earlier spreads are found in the highlands: Tsezic languages in Avar-Andic-Tsezic; Khinalug and then Archi, Rutul, Tsakhur, Kryz, and Budukh and then Tabasaran and Aghul from three spread episodes in the Lezgian branch; in Dargwa, the divergent Chirag, Mehweb, and Kubachi branches are found only in the highlands. There are also two major branches without a reconstructed lowland origin, which may therefore reflect the earliest phase of Nakh-Daghestanian spreading: the Nakh branch, which Nichols (2004) traces to the south slope highlands, and Lak, an isolate

branch of Daghestanian spoken in the central Daghestan highlands.[4] The Nakh languages have dispersed in the very different ecology of the central Caucasus and generally exhibit the kind of linguistic and social geography typical of the central and western Caucasus, where resources are richer, the landscape less rough, and marriage customs obligatorily exogamous, so that there is much less sociolinguistic isolation of highland towns. Societies and language populations are larger there as a result: there are no one-town languages and no autonomous city-states, but a sizable speech community distributed over many towns and forming a large, densely interconnected network. Nonetheless, archaisms and divergent dialects here too are found in the highlands, and the reconstructable directionality of language spread for the last several centuries is uphill.

To summarize, the central crest type of mountain area as exemplified by Daghestan has a standing uphill direction of language spread which leaves truncated branches, isolates, and archaisms in the highlands and brings in innovations and new languages from the lowlands. Though uphill spreading seems to be a more or less constant factor, a central crest mountain area is not a spread zone. For one thing, the spreads are usually localized to individual river canyons, and usually there is an upper limit to such spreading. For another, the pace of spreading is sufficiently slow that considerable diversity remains in the highlands, so that the central crest area as a whole is quite diverse, unlike a spread zone. Thus language families and branches in mountains can be quite old; Nakh-Daghestanian appears to be of at least Indo-European-like age and its Lezgian branch appears nearly that old. In contrast, language families in spread zones are rarely very old because spreads there are faster and/or more frequent and they leave few relics.

2.2   Altiplano

An *altiplano* is a high plateau surrounded by mountains and therefore with chiefly interior drainage.[5] Prototypical examples are Tibet and the Andean Altiplano, but I also include the New Guinea highland valleys. Because of its altitude and surrounding mountains, an altiplano is difficult of access and has sparse and distinctive but potentially rich resources requiring specialized adaptation. Once a society (with

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4.   Further evidence that Nakh was an early dispersant is its phylogenetic divergence from Daghestanian and its location at the western frontier of Nakh-Daghestanian. For Lak neither of these considerations holds; only its lack of a lowland or foothill range testifies to its very early separation from the rest of Daghestanian.

5.   I believe the term *altiplano* is used only in the Americas and only as a proper name (referring to the Andean Altiplano unless otherwise modified, e.g. the Mexican Altiplano). I am using it as a general term and a common noun with not just geological but also, and primarily, linguistic-geographical meaning.

its economy, culture, and language) has adapted to such an area and spread over it, it is difficult to dislodge. The relative ecological uniformity of the altiplano and the sparseness of its resources make it a natural spread zone, but because the initial immigrant is hard to dislodge the succession of spreading languages comes not from the outside but from inside the spread zone: a dialect or daughter language spreads by language shift and absorbs the speakers of its former sisters, reducing what genealogical diversity has built up since the earlier spread. Contact effects come from closely related languages and are overrun by similar effects in the next spread, so the result in the long term is typological and genealogical stasis. Unlike central crest highlands, an altiplano is a center of spread, and in fact an altiplano language can spread downhill to the surrounding slopes and even plains.

Tibet illustrates all of these processes. The Tibetan plateau was essentially uninhabited until about 6000 years ago, at which time the domestication of the yak and the rapid spread of a human gene adapting to a low-oxygen environment made colonization possible (Brantingham et al., 2007; Guo et al., 2006; Hoffmann, 1990; Simonson et al., 2010; Yi et al., 2010). The archaeological and historical culture has been essentially Tibetan since then.[6] Now, the Tibetan language family is only about 2000 years old and has a recorded history tracing it to a spread from the eastern Tibetan regions (see LaPolla 2001), so the language spoken by the first colonizers of 6000 years ago cannot have been the reconstructed Proto-Tibetan but must have been an earlier ancestor. The imperfectly attested extinct Zhang-zhung language recorded from western Tibet is likely to be a sister to the whole Tibetan family, descended from an earlier ancestor (call it Proto-Macro-Tibetan), consistent with spreading from within the area.[7] Tibetan languages have spilled over to the Himalayan south slope, influenced Mongolic and Chinese varieties and contributed to language mixture at the eastern periphery of Tibetan (see Hugjiltu, 2003, and Slater, 2003, for the Tibetan-Mongolic interface to the north-east of Tibet), and influenced Tocharian (Sapir, 1936). To summarize, Tibet shows evidence of linguistic entrenchment, repeated spreading within the family, and spreading from the altiplano downhill.

The Andean highlands are another example. The early prehistory of the area involves various short-lived states that arose to the west and northwest, in all probability speaking a variety of languages. A sizable spread of the Aymaran language

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6.   Again I write in the ethnographic present, stopping at about 1950 and leaving out the recent swamping of Tibet and the Tibetan language by Chinese immigrants and language.

7.   For Tibetan linguistic history see Nagano & LaPolla (2001); Hoffmann (1990); Denwood (2007); and Bradley (2002). After this article had gone to press I came across Aldenderfer, 2011, which includes much more archaeological detail on Tibet, and Qiu, 2015, which is a recent survey of archeological and genetic evidence.

family probably occurred with the rise of the Tiwanaku empire centered in the south (c. 300 BCE-end of first millennium CE). Aymaran survives today only at the edge of the plateau and in surrounding mountains, displaced by Quechuan, which spread as the predecessor of the Inka empire succeeded the Tiwanaku empire beginning c. 1300 CE. There was then a large secondary spread of a Quechuan variety from the Tiwanaku area accompanying the spread of Inka power, peripheralizing the other dialects and presumably absorbing still others, now extinct. Quechuan has spread well into the lowlands in the north (Colombia, Ecuador, upper Amazonia in Peru) and south (Argentina), and there is also evidence of typological and cultural influence running from the Andean highlands to the northern Argentine interior (Donohue & Michael, 2010).[8] Now, Aymaran and Quechuan are structurally very similar and have many lexical sharings; they have often been considered sister languages, but Campbell (1995) and McMahon, Heggarty, McMahon, & Slaska (2005) show that the various similarities are due to contact and not relatedness.[9] Thus the initial Quechuan spread (perhaps c. 800 CE) was not a spread from within the family, but it was certainly a spread from within the area or contact zone and entailed minimal structural change. A second Quechuan spread came c. 1200–1300 CE, when the spread of the Inka empire far to the north and south brought a southern dialect from the vicinity of Cuzco far to the south and north, while the more diverse central zone retained the variety of dialects that had formed earlier; this spread was from within the family (see Mannheim, 1991; Adelaar & Muysken, 2004, pp. 179–188). Neither the Quechuan spreads nor the Aymaran one brought about a clean sweep of the entire Altiplano, and furthermore the spread of Quechuan was solidifed by the Spanish conquest, as for both administrative and religious purposes the new rulers needed to find a single language to regard as the main indigenous one, and that language was a widely used southern Quechuan variety. Still, the history of the Andean altiplano illustrates spreading from within, spread downhill out of the altiplano, and typological and genealogical stasis.

The New Guinea highlands are a third altiplano area. With their chilly climate the highland valleys are unsuitable for some of the horticulture and hunting practiced in the lowlands and lower slopes, but they have rich soil, are malaria-free, and have large and dense populations of horticuturalists. Plant domestication dates back some 9000 years here (Denham et al., 2003; Denham, 2005), and plant

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8. For the Aymaran and Quechuan history see Adelaar & Muysken (2004) and Mannheim (1985, 1991).

9. Campbell also finds some evidence of a possible much deeper relationship, but this would have long antedated the contact that gave rise to the sharings that have been taken for evidence of common descent.

exploitation goes back about 40,000 years (Summerhayes et al., 2010). The languages of the highlands fall into several families, all with some strong typological similarities that differentiate them from most of the lowland languages. Many specialists on New Guinea languages believe that most of the highland languages fall into a single ancient family that spread with the first horticulture (see various chapters in Pawley, Attenborough, Golson, & Hide, 2005). There have been several local spreads of families in the highlands, some of which are fairly old, but there has been no pan-highland spread more recent than the putative Trans New Guinea spread and in particular no spread of a language entering from the foothills or lowlands. There have been spreads of languages and influence from the highlands to the foothills and lowlands both north and south (see Ross, 2005, p. 34, Map 5). The highlands, though linguistically more diverse than Tibet or the southern Andean altiplano, are less diverse both typologically and genealogically than the surrounding foothills and lowlands.

In addition to these large altiplanos there are probably a number of smaller ones. In the eastern Caucasus, the Lak language, an isolate subbranch of Daghestanian, occupies an altiplanito and behaves accordingly. Lak is the only exclusively highland Daghestanian language with a large population (well over 100,000 speakers according to Korjakov, 2006, p. 32). The Lak lands are fairly level, travel and communication between towns is easy, and though the territory is sizable for the Daghestanian highlands the several Lak towns all speak the same language. Lak itself has minimal dialect divergence and must therefore have an internal age of under 500 years, though as described above it is likely to have been a very early separant and to have occupied its highland-locked territory for a long time. That would mean that its recent spread over its territory absorbed its own close sister, and probably there were similar earlier spreads, all of which have pared the branch down to a single descent line. Lak spreads outside of its own borders: there are several detached enclaves surrounding it (see Korjakov, 2006, Maps 12, 13), all apparently due to spillover from the Lak plateau. The largest and most striking of these is on the opposite (south) side of the northern of the two major east-west crests in the eastern Caucasus, on a south-flowing upper Samur tributary and in contact with Rutul and Tsakhur of the Lezgian branch. (The main Lak plateau is on a north-flowing tributary of the Avar Koisu.) In addition, the Lak people themselves have and have traditionally had one of the highest rates of out-migration, both transhumant and permanent, of any Daghestanian highlanders (Karpov & Kapustina, 2011, pp. 44–48; they attribute this to a land shortage and less productive soils in the Lak lands).

To summarize, altiplanos are a kind of spread zone, and specifically a closed spread zone where there are few or no new entries and the pattern of successive spreads over time involves daughters and nieces of earlier spreading languages. The linguistic consequences include genealogical and typological stasis for long periods.

3.   Flatland spread zones

Lowland spread zones fall into two types: open spread zones, where entry is relatively unhindered and successive spreads are likely to involve different languages; and closed spread zones, the analog to altiplanos.

3.1   Open spread zones

An open spread zone is one that languages can enter from more than one side. A new entrant language can spread, and if it does, language succession creates structural and genealogical diversity of languages: in the spread zone itself, over time and in substratal and contact effects, and around the periphery where relics of former spreads escape extinction. The periphery itself is a potential source of further entries and spreads. An example of an open spread zone is the Great Plains of North America, which supported thriving populations of buffalo hunters and traders in buffalo hides, as well as raiders of and traders with the Pueblo civilizations to the southwest of the plains. At contact, a handful of different language families each occupied a good-sized territory in the plains. From north to south they were: Athabascan, which spread from the northwest, participating in Plains culture both in the north and in the far south (Apachean languages, of which Navajo subsequently adapted in part to Pueblo culture); Algonquian (Cree, Blackfoot, Cheyenne), which spread ultimately from the west and locally, later, from the east; Siouan (notably Dakota), which spread from the east; Caddoan (Arikara, Wichita, Pawnee), which spread from the south and southeast; Uto-Aztecan (Comanche), which spread from the northern Great Basin; and Kiowa-Tanoan (Kiowa), which spread earlier from the Great Basin. Had history gone differently, most of the plains might well be Dakota-speaking by now. (For the plains spreads see e.g. DeMallie, 2001; Goddard, 1996, 1999; Hill, 2004; Ives, 2003; Ives & Rice, 2006.)

For the Great Plains we know something of the ethnic and sociolinguistic processes that accompanied the early stages of spreads. In the sixteenth century the Plains cultures acquired horses, and shifting and expansion of economic spheres and language and confederation boundaries ensued. There was much intermarriage, affiliation and reaffiliation independent of ethnolinguistic groupings, and in general little continuity between political and cultural groupings on the one hand and language boundaries on the other (see Ives, 2003; Moore, 2001). Moore shows how the Cheyenne formed as a new ethnic and political unit out of different ethnic components and entered the Plains area. Ives shows how Athabaskan-speaking groups became affiliates of the Algonquian-speaking Blackfoot of the Plains culture area.

Another open spread zone is the Great Basin of western North America. A high desert with occasional rich resource patches, it has supported at least one and perhaps two or three language spreads in the last several millennia. Most recently, the Numic branch of Uto-Aztecan spread from the southwest to rapidly cover the entire Great Basin and at contact was still spreading beyond the edges of the Basin: Comanche moved eastward to enter Plains culture, Shoshone was spreading to the north, and Northern Paiute and Mono were ascending into the Sierra Nevada to the west. Prior to the Numic spread, at least the southern part of the Great Basin was occupied by the agricultural Fremont Culture, whose bearers probably spoke a Kiowa-Tanoan language (these languages now survive in some of the pueblos and in Kiowa of the plains); prolonged severe droughts c. 900–1100 and 1200–1350 CE (Stine, 1994) made possible the spread of the foraging Numic speakers and the retreat of the Fremont Culture. In the first few postgacial millennia the western Great Basin harboured a rich fluvial and lacustrine system that was exploited by people whose likely descendants speak the Washo isolate and languages of the Penutian macrofamily (Maidu, Klamath, Sahaptin). As the area gradually dried out, and particularly after the above-mentioned medieval drought, these lacustrine specialists retreated into the mountains and interior of California and Oregon and were succeeded by Numic speakers. Here, unlike the Great Plains, the sociolinguistics of the Numic spread and the question of whether it was primarily demographic or primarily a matter of language shift is still open (see Aikens, 1994; Bettinger & Baumhoff, 1982; Hill, 2001; Babel, Garrett, Houser, & Toosarvandani, 2013, for different interpretations).[10]

A third example of an open spread zone is the central valley of California. As of about 1000 years ago, the southern portion, the San Joaquin Valley, probably had a somewhat diverse linguistic population: one or more Uto-Aztecan languages in the south, perhaps Salinan or its relative, and in the center and north a well-diversified Penutian branch I will call Macro-Yokuts, of which Yokuts is only a small subdivision (see Moratto, 1984, pp. 556–557; Whistler & Golla, 1986). The northern half, the Sacramento Valley, probably had much the same linguistic population as it did at contact, primarily Wintuan speakers but possibly also some Wappo and perhaps speakers of other languages found historically only in the surrounding foothills. During the medieval drought the valley became much less productive; some of its inhabitants presumably withdrew to the foothills, and sociolinguistic and economic centers shifted from the valley to the foothills, especially in the south. After the drought ended Penutian languages, primarily Wintuan, reclaimed the northern valley and the Yokutsan branch, possibly in the form of

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10. For the Numic spread in general see Madsen & Rhode (1994).

a single protolanguage, spread back from some refuge point to reclaim the entire southern portion, perhaps absorbing speakers of some of its sister languages. No other languages spread widely in the valley in the short period between the end of the drought and the beginning of European contact, but the surrounding foothills and mountains, with their great linguistic diversity, were a reservoir of potential additional spreading languages. About the sociolinguistics and identity issues in these spreads little is known beyond what can be inferred from the linguistic map and the archaeological evidence.

A fourth example is the Danube plain in central Europe, chiefly today's Hungary. In late prehistory and early historical times it has had numerous linguistic immigrants: Celtic (Indo-European) from the west, Scythian (IE: Iranian), then Hunnic (Turkic?), then Alanic (IE: Iranian; in my opinion this is what the central European Avars spoke before shifting to Slavic) from the steppe, Germanic (IE) from the west, Slavic (IE) possibly from both north and south, and Hungarian (Uralic) from the steppe. Probably each entry produced a language spread to at least some extent, and perhaps the typical situation was what is historically known for Hungarian: a spread across most of the plain and extinction of languages previously spoken there. Hungarian was the entering language of a nomadic steppe population, but unlike the earlier Alanic, Hunnic, and Scythian languages, it has firmly taken root in the plain and nearby.[11]

3.2   Closed spread zones

A closed spread zone is one where, as with an altiplano, there are obstacles to the entry of new languages and consequently successive spreads generally come from a descendent of the previous spreading language. Spreading is mostly by language shift. The contact phenomena that accompany shift, together with the extinction that shift brings about, reduce the genealogical and typological diversity of the area.

The clearest case of a lowland closed spread zone is Australia. Its dry climate, generally flat topography, and short coast make it a natural setting for a spread zone, and occasional prolonged droughts caused most of the interior to be abandoned entirely and then later recolonized, often by one or few languages replacing whatever typological and genealogical diversity had been there before. As a consequence, linguistic diversity is low in Australia except for the better-watered

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11.   Hungarian is an entrant to the steppe from southwest Siberia, where its closest sister language Mansi is spoken by people who were hunter-gatherers until recently. It is also atypical in having been preserved as a distinct language in an enclave in a Turkic confederation; most groups drawn into the steppe economy and culture shifted to the dominant language, in this case Bulgar Turkic. For its prehistory see Golden (1990, pp. 242–248).

near-coastal strip in the north (for a map see Evans, 2003, p. 2). About 6000 years ago the Pama-Nyungan language family spread out from the northeast eventually to cover most of the continent, and especially in the dry interior the linguistic history since then has involved one branch of Pama-Nyungan spreading at the expense of another. Even the eastern coast, rich in resources and with a large number of individual languages, is exclusively Pama-Nyungan in its stock affiliation. (The Pama-Nyungan spread here must have involved language shift triggered by important ritual functions of Pama-Nyungan speech and by technological and social innovations of its speakers, chiefy the ability to accumulate and store sufficient food to host large ceremonial gatherings; Evans & Jones, 1997; Evans & McConvell, 2004.) The Pama-Nyungan spread was preceded by intensification and technological innovations also spreading from the northeast beginning about 8000 years ago (Lourandos, 1997). In the interior, the Pama-Nyungan expansion was the means whereby interior lands abandoned during an immediately preceding drought were recolonized; this meant that all preceding linguistic diversity there was lost and replaced by a single Pama-Nyungan branch (see McConvell, 1996). (This part of the Pama-Nyungan spread was then a demographic expansion rather than a language shift.) The earlier Pama-Nyunganization of the east coast meant that this previously diverse area could no longer provide structurally and genealogically varied entrants to the interior. There has also been extensive contact across the continent, lowering diversity even more. As a result, unusual structural properties such as a consonant system with only one manner of obstruent articulation, elaboration of anterior places of articulation, and no fricatives, and grammatical properties including ergativity and inclusive/exclusive distinctions, are extremely common in Australia though they are minority phenomena elsewhere.[12]

The combination of typological and genealogical non-diversity, and the difficulty of teasing apart contact effects and inherited properties, have in the past inclined a number of comparativists to assume that all existing Australian languages may descend from a single ancestor that colonized the continent over 50,000 years ago. This is unlikely, as Australia and (linguistically very diverse) New Guinea were a single land mass until the postglacial sea-level rise separated them (the process began in the west about 16,000 years ago and was complete with the formation of the Torres Strait in the east some 8000 years ago). The land now underwater could have harboured a linguistic population as diverse as that of northern Australia or southern New Guinea, providing many potential entrants to the interior spread

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12.   For Australian prehistory see references above and McConvell (2001); Bowern & Koch (2004); Hiscock & Wallis (2008); Veth (1993).

zone and the richer coastal areas in the east. The period of potential immigration lasted over 20,000 years, longer than the postglacial isolation.

What is distinctive about Australia is its history of extensive spreading and contact combined with its isolation: there have been no, or almost no, linguistic immigrations during the 8000 years that Australia has been physically isolated.[13] Thus, even if it is ever shown that all Australian languages descend from a single ancestor, that is not because the first immigrant of over 40,000 years ago has monopolized the continent ever since, but because the spreading and consequent decimation of diversity happen to have removed all but one descent line.

That is the picture of a prototypical closed spread zone: no new entrants, extensive spreading with consequent shift and extinction, and much contact, the net result being a high incidence of several typological features that are infrequent elsewhere and a single stock almost coast to coast. Of all the factors, extinction has probably had the single greatest impact on the typological and genealogical composition of Australia.

Africa is another example, though not as extreme as Australia. Africa too has dry climates over much of its surface, a fairly flat topography, and a short coast. It has more genealogical and structural diversity than Australia does because it is larger, ecologically less uniform, and not entirely isolated. Linguistic immigration from the Near East has occurred in historical times with the Arabic spread (7th century CE) and the immigration of ancestral Ethio-Semitic from the southern Arabian Peninsula to Ethiopia probably in the second millennium BCE. (This was actually a back-migration; the Semitic branch of Afroasiatic had previously spread from Africa to the Near East.) From about 10,000 to about 7300 years ago a shift in the monsoon belt brought more precipitation to northern Africa and the Sahara Desert there became a grassland. The human population of the Sahara increased and was no longer limited to watercourses. Midway during this phase, domestication spread across North Africa, partly from Near Eastern sources and partly indigenous. One or more linguistic entries from the Near East are likely to have occurred at this time. The Sahara became arid again about 7300 years ago, at which point archaeological evidence of occupation largely disappears except along major watercourses (notably the Nile). (For this climate history see Kuper & Kröpelin, 2006.) This must have entailed decimation of whatever languages had spread into the Sahara from the south, the coast, the Nile valley, and the Near East, so there is no guarantee that any immigrant language survived. From the dawn of

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13.   There was apparently some limited immigration of horticultural people(s). The horticulture and languages are now lost in spreads and shifts, but plausible substratal effects remain (Denham, Donohue, & Booth, 2009).

history to modern times the only languages in a position to immigrate from the Near East were Semitic languages, and any Semitic immigrant language would be immediately identifiable as Semitic and hence as an immigrant (as the Ethio-Semitic branch is).

The genealogical diversity of Africa is low,[14] and, though it lacks the coast-to-coast typological consistency exhibited by Australia, Africa has relatively low typological diversity and some widespread features that are minority or rare properties elsewhere: tones and gender systems are extremely frequent in Africa, the incidence of ergativity is close to zero, and elaboration of airstream mechanisms in consonant systems is common (culminating in the extremely large consonant systems of the click languages of southern Africa). Very large language spreads have occurred in the north (Berber, then Arabic) and the south (Bantu), with extinction of whatever languages were there before. The desiccation of the Sahara after its brief wetter phase must have caused extinction of languages and loss of diversity, and droughts in other parts of the continent must have had similar effects from time to time. Thus extinction has been an important factor in the linguistic evolution of Africa.

A third closed spread zone is Mongolia and the eastern steppe since the rise of pastoralist economies there in the Bronze Age (Schönig, 2003; Janhunen, 1996, 2003b; Golden, 1998; Nichols, 2011a, 2011b, 2012a). Mongolia, with its steppe ecology and cold winters, is a natural spread zone. Once a nomadic pastoralist economy was in place there were barriers to entry on all sides. To the north was the taiga, which is not conducive to farming or herding, so societies that succeeded in the taiga were unlikely entrants to the pastoralist grassland. To the east and southeast was what is now northeast China, with a large and mostly settled population that was not equipped to adapt to a nomadic pastoral economy; the same was true of China farther southeast. To the south was desert, then Tibet, with a very different pastoral economy and very different ecology. To the west were the richer western and central steppe, which were not sources of immigration to Mongolia but, on the contrary, targets of spread and conquest from the vicinity of Mongolia.

Turkic and Mongolic languages were indigenous to Mongolia. Throughout their prehistory and early history there was back-and-forth fluctuation in their relative economic and sociolinguistic dominance, as technological, economic, and political advances created a series of expanding frontiers that could easily be exploited by a nomadic pastoral population. Consequently there was

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14. A few additional families and isolates have been recognized recently, but the overall diversity of Africa remains low. See the current AUTOTYP genealogy for the classification assumed here (URL: www.spw.uzh.ch/autotyp/).

much contact, bilingualism, and back-and-forth shifting. (A surviving example of the linguistic symbiosis that may once have been common across the area is Khamnigan Mongol, a language symbiotic with the Tungusic language Evenki; Janhunen, 2003a, 2005.) Over time Mongolic and Turkic came to resemble each other so strongly that it has taken a great deal of close philological effort to distinguish loan vs. native vocabulary and reconstruct discrete ancestors for the two families. The area is characterized by reduced structural diversity and a number of well-entrenched unusual phenomena: exclusively suffixing morphology and exclusively head-final word order even in NPs; ATR vowel harmony and front rounded vowels; a simple syllable structure; a simple prosody with no tones and little or no contrastive stress; a simple morpheme canon with some neutralization of contrasts morpheme-initially; a base-intransitive lexicon and extensive use of causativization in the causative alternation (Nichols, Peterson, & Barnes, 2004); and pronoun systems with *m* as first consonant in the first person pronoun and an apical or palatoalveolar obstruent in the second person (Nichols, 1999, 2012a; Nichols & Peterson, 1996, 2005). This structural type is likely to have dominated in and near the area for some time; the Tungusic and Uralic language families also display it, and to a lesser extent also Japanese and Korean. It is the result partly of amplification of traits that happened to be present in the languages, but partly also of the distinctive sociolinguistics of the Turco-Mongol interaction, which selected for certain kinds of non-complexity and transparency (Nichols, 2011a, 2011b).

In terms of their genealogical and linguistic diversity, closed spread zones (including altiplanos) behave much like bottlenecks. They are not literal geographical bottlenecks; far from it, they are wide open spaces. But their long histories of extinction and convergence reduce the number of descendants relative to the number of ancestors and the number of types relative to the earlier situation. On the other hand, they can produce extreme development and elaboration of unusual typological variables, and these can expand the known inventory of linguistic phenomena: consider the extended multiple case marking of Australian languages, the inventories of clicks in southern African languages, or the series of front rounded vowels in languages of the Ural-Altaic linguistic type. An entrenched distinctive, even eccentric, typology can be taken as the grammatical hallmark of closed spread zones.

4. Discussion and conclusions

To summarize, closed spread zones, both the more common horizontal ones and the altiplanos, involve repeated episodes of convergence and spread from the same

linguistic population, with minimal new input, and over time they can produce extreme typological profiles and extremely low diversity. Open spread zones have more varied sources and, though they also produce extinction and lowered diversity, diversity can build up at the periphery where relicts can survive from previous spreads. Central crest mountain areas have a standing pattern of uphill spread from the variety of sources in the surrounding lowlands, but they are not spread zones, as they produce more diversity than uniformity. Also, their highland languages can reach great degrees of grammatical complexity, while the shifting and contact-induced changes in a spread zone usually lead to simplification. The ultimate causes of standing spread patterns are geographical, but the proximal causes, those that have linguistic explanatory power, are sociolinguistic: isolation of highland communities leads to complexification and diversification of their languages; the repeated spreads and back-and-forth shifting of a closed spread zone lead to simplification, convergence, and mutual stabilization, amplifying whatever grammatical patterns happened to dominate in the input languages.

The above is a schematic view, based on the cases for which we have enough knowledge to draw any inference: the Plains, eastern Pama-Nyungan, and Quechuan spreads discussed above, and the Eurasian steppe of the Iranian and Turco-Mongol periods as summarized in Nichols (2011b, 2012a). For all of these spread zones, essential factors in the early stages of spread were restructuring of ethnic and ethnolinguistic boundaries, new economic opportunities to be gained from social realignment and expansion of sociopolitical networks, and a widening of the sphere of communication and information – early, and local, analogs to globalization. The same is likely to have been true of the western Eurasian steppe at the time of the Indo-European spread (Anthony, 2007, pp. 225–329 and elsewhere) and the Kazakh steppe and nearby at the early stages of livestock domestication and pastoralism (Frachetti, 2008, 2012). These various restructurings and expansions of networks appear to have happened under frontier conditions, in the absence of any reliable political control or durable sense of a language standard, and ready mixture of language norms would have been a natural consequence.[15]

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15. This means that the sociolinguistic and grammatical nature of the contact was not between standard and non-standard, or high and low, languages, but more like the contact between inter-ethnic and emblematic languages described by Ross (1996). Inter-ethnic and emblematic languages are on a more or less equal footing, but the inter-ethnic one happens to be used for communication outside the home community in this high-diversity setting. The inter-ethnic language influences the semantic structure and morphosyntax of the emblematic language, resulting in metatypy (Ross's term for the often considerable morphosyntactic and lexical typological change in such situations) while the emblematic one influences the phonology and phonetics of the inter-ethnic one.

Based on the cases reviewed here, these factors obtain for both open and closed spread zones, and for altiplanos as well as lowland spreads. They must be constants of the spread situation in general, and the different linguistic consequences of open vs. closed spread zones are based on the frequency and variety of contact and shift episodes rather than on their sociolinguistics per se.

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PART 4

Grammar and evolution

The role of adaptation in understanding linguistic diversity

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The 6,000–7,000 languages spoken by people display a dazzling variety of sounds, word patterns, and grammatical forms. The dominant explanation for this diversity is that languages drift apart as communities separate. The accumulation of random changes eventually produces languages that are mutually unintelligible. We argue that in addition to this non-functional process of drift, language change and diversification can be explained in functional terms as adaptations to social, demographic, and ecological environments in which the languages are learned and used, a proposal we call the *linguistic niche hypothesis*. We support our position with a series of agent-based models that serve as an existence proof for why language diversity requires adaptation. We next discuss empirical evidence for a link between aspects of socio-demographic factors, ecological factors, and grammatical structure which strongly suggests adaptation to be at work. One mechanism we focus on is language learnability: while all languages need to be learnable by infants, only some languages are further constrained by adult learning biases. Thus, languages which for historical reasons have adult learners adapt to be more learnable by adults.
As a result, languages spoken in larger and more heterogeneous environments in which adult language learning is more likely to take place tend to be grammatically simpler than languages spoken in small homogeneous environments. The linguistic niche hypothesis outlined in this chapter, while still in early stages, promises to shed light on longstanding questions such as why there are so many languages, and why they differ so substantially from one another.

1. Introduction[1]

Human groups display a dazzling diversity of cultural practices. Clothing styles, building techniques, cooking practices, art, and legal systems all show enormous

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variability. Attempts to understand why people in equatorial Africa wear different clothes from people in the Arctic would not get far without considering differences in climate. It is also rather obvious that traditional cooking techniques are strongly constrained by availability of certain foods and the preparation those foods require. Yet, when it comes to language – another culturally transmitted system showing enormous cross-cultural diversity – the assumption most linguists and psychologists have made is that linguistic variability is not meaningfully related to factors that strongly constrain, or even determine, other aspects of human culture.[2] We argue that – just as looking to the physical environment is necessary to explain differences in cultural practices such as clothing styles and building techniques – looking to the social and physical environment is necessary for understanding at least some reasons why languages vary in the way they do.

We begin by addressing a fundamental question of why there is linguistic diversity at all, and suggest that languages diversify in part because they are adaptations to different human environments. Next, we describe prior work showing that it is possible to account for some specific aspects of linguistic diversity by considering the socio-demographic 'niches' in which languages are used. On this view, languages adapt over time to optimize learnability and information-transmission within specific niches. This perspective is largely in line with that proposed by other contributors to this volume, particularly the work of Trudgill, and in the analyses of Burridge, LaPolla, Palmer, Stebbins, and Tadmor.

2.   Why are there so many languages?

According to the story of the Tower of Babel, there was a time when all humans spoke a single language. A hubristic attempt to build a tower to the heavens led to God jumbling human languages (*Babel* comes from the Hebrew *balal*, to jumble). It is instructive to ask why there should be such a story at all. While existential wondering such as "where does the world come from?" (God made it) or "why do all humans look similar?" (made in God's image) seem a natural fit for religious texts, the question "why are there so many languages?" appears much more esoteric by comparison. One answer is that for most of human history languages were extraordinarily regional (a similar point is made by Trudgill, this volume).

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2.   We do not mean to suggest that cultures vary without limit, or that certain environments always produce particular cultural artefacts or institutions. The associations are always probabilistic. For example, we expect it is less likely that a culture without access to clay develops a tradition of pottery, or that new types of sailing technology are invented in a culture that is landlocked.

From one settlement, one would need to walk a long way to encounter humans with obvious physical (racial/ethnic) differences. In comparison, in most places in the world the distance to the nearest language would have been quite short. Even at present, half of the world's languages have fewer than 7,000 speakers, and half are spoken over an area smaller than Luxembourg (Ethnologue, Gordon, 2005). As a result, people would be frequently exposed to individuals who look very much like them, and yet speak different languages, leading them to wonder "why?" Strikingly, we still do not have a clear answer. Explanations of linguistic diversity, both at the dialect and language level, have focused on drift. For example, Sapir (1921) writes:

> […] dialects arise not because of the mere fact of individual variation, but because two or more groups of individuals have become sufficiently disconnected to drift apart, or [drift] independently, instead of together. So long as they keep strictly together, no amount of individual variation would lead to the formation of dialects. In practice, of course, no language can be spread over a vast territory or even over a considerable area without showing dialectic variations, for it is impossible to keep a large population from segregating itself into local groups, the language of each of which tends to drift independently.   (Sapir, 1921, p. 161)

Linguistic drift arising from both synchronic and diachronic processes is undoubtedly important in understanding the diversification of languages and geographic clustering (so-called areal patterns). But drift may not be the sole driver of linguistic diversity. Consider an analogous argument that drift is the source of biological variation. We can easily apply Sapir's analysis to, for example, a colony of finches. As the initial finch group splinters, the members of each subgroup will be more likely to mate with one another and, over time, the two groups will drift further apart genetically, eventually producing different species. But such an account leaves out a critical element: adaptation. An account of biological diversity that excludes adaptation cannot explain why, compared to the ancestral species, some finch species should come to have wider beaks, while others, longer beaks. The divergence of the groups is due not just to assortative mating, but also to the groups being subjected to different selective pressures. Even populations that remain in close proximity can rapidly diverge if their members come to occupy distinct niches that place an adaptive pressure on some trait, e.g. beak shape or foraging strategy. Indeed, the Galapagos finches initially studied by Darwin occupied small and often overlapping territories (see Weiner, 1995 for a book-length account of the fascinating research on Darwin's finches).

Our ability to explain why a particular animal has the features it does clearly requires a consideration of the environment in which (and in a sense, *for* which)

it has evolved.[3] Here, we take this argument into the domain of languages. Just as with a beak of a particular shape, a particular grammar can be viewed as an adaptation to a particular environment.

3. How different are languages, really?

Before attempting to answer the question of what environments shape languages and how they might do so, it is worth considering the more fundamental question of whether languages really are different from each other in interesting ways. After all, in order for some languages or language variants to be preferentially selected, there must be variability from which to select.

Although the notion that languages differ at least on the surface is not in dispute, in some quarters it has been fashionable to assume that such variability is illusory and that its study detracts from the 'real' goal of understanding the deep structure of language. Such a deep characterization of language is often taken to be the generative model on which all languages are based (i.e. Universal Grammar). For example, Pinker (1994) writes:

> According to Chomsky, a visiting Martian scientist would surely conclude that aside from their mutually unintelligible vocabularies, Earthlings speak a single language.   (Pinker, 1994, p. 232)

It is true that all languages share certain design principles such as compositionality and symbolic reference that make them, as a group, distinct from other forms of communication (both non-human animal communication and nonverbal human communication). Insofar as there are universal design features that separate human language from other communication systems, studying these features (e.g. symbolic reference, compositionality: Deacon, 1997; Hockett, 1966) involves delving into the question of origins – questions that the Chomskyan research program has avoided, for the most part.[4]

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3. Evolution, of course, has no foresight. To say that a phenotype evolved for something is simply to say that the underlying genotype is more likely to be copied and, as a result, the phenotype becomes more prevalent in the population.

4. Consider a conclusion analogous to that reached by Chomsky's visiting Martian: "all life on earth is just variation on a Universal Grammar of DNA; differences among species are just dialects of DNA." At a high-enough level of abstraction, this is true. What would a scientist who is interested in this level of analysis study? Presumably, they might be interested in addressing questions about the origin of DNA, its stability in various chemical environments,

Claiming that "Earthlings speak a single language" is a bit like saying that there is only one kind of bird; that apart from different colours and sizes, and shapes, and so on, all birds are the same. It may indeed be useful to distinguish between animals that are birds and those that are not and we can fruitfully ask what is true of *all* birds. But surely it is at least equally sensible to ask why some birds eat fish and others eat insects and what characteristics make a bird suitable for one type of diet versus another, as well as why some parts of the world have many different species of birds and others have few. If we examine languages at a similar level of analysis, how substantial are differences between languages?

Judging by the difficulties that linguists have had in constructing even short lists of true linguistic universals (Evans & Levinson, 2009), the differences appear to be substantial. To give just a few examples: while some languages have rich inflectional and derivational systems of affixes, other languages appear to have little to none (e.g. Vietnamese; Thompson, 1987). Languages vary greatly in the depth of recursion they employ. Whether one takes at face value Everett's (2005, 2009) claim that Pirahã lacks recursion entirely, one cannot dismiss the fact that recursion depth differs substantially between languages (e.g. Evans, 2003; Mithun, 1984). Although controversial, it has even been suggested that what were thought of as the fundamental building blocks of language—nouns, verbs, adjectives, and adverbs—are not universal as evidenced by languages such as Straits Salish (Jelinek & Demers, 1994) where the boundaries blur, mirroring a Borgesian fiction:

> […] there are no nouns but only impersonal verbs, modified by monosyllabic suffixes or prefixes[s] [F]or example, there is nothing equivalent to our word 'moon', but there is a verb that for us would be 'to moonrise' or 'to moon'. 'The moon rose over the river' would be 'Hlör u fang axaxaxas mlö': […] 'Upward, behind the onstreaming, it mooned.' (Borges, 1964, p. 8)

Even in phonology – the part of language perhaps most obviously constrained by physical limitations on production and perception – there are substantial differences in phoneme inventory size, syllable complexity, stress patterns, etc. (see Maddieson, Bhattacharya, Smith, & Croft, 2011, to get a sense of differences in consonant inventories and their world-wide distributions). To be sure, there are numerous constraints on cross-linguistic phonological variation. However, here too, the focus traditionally has been on phonology-internal factors rather than on

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properties of its replication, etc. The Chomskyan tradition, however, attempts to analyse language at this most abstract level while simultaneously rejecting as irrelevant both the origins of language and its functions. One would be forgiven for thinking that the relevance of what remains is hard to grasp.

understanding precisely how vocal production and speech perception shape phonological systems, or understanding the constraints that different environments may place on the functional properties of phonology, such as sound transmission through various mediums (see Ember & Ember, 2007 for some intriguing observations and speculations). For example, is it simply a coincidence that whistled languages such as Silbo Gomero (e.g. Meyer, 2004) tend to occur in environments that call for a way to communicate across large or difficult to traverse areas? Or do such phonological systems comprise an adaptation to the environment, a solution to a particular problem?

In summary, despite all languages having certain common design features (largely, those that distinguish language from other communication systems) at a level of analysis that examines grammars and lexicalization systems of specific languages, analyses have failed to find support for absolute universals. As put by Levinson, "[t]here is no sense of 'broad' under which 'the grammars and lexicons of all languages are broadly similar.' If there were, linguists could produce a huge range of absolute linguistic universals, but they cannot do so" (Levinson, 2003, p. 28). The rule seems to be constrained diversity, not universality.

3.1   Simulating the role of drift and selection pressures in linguistic diversity

Before we present further evidence for our claim that languages adapt to their environments, we showcase a very simple simulation that implements the basic idea of languages adapting to their environments. So far we have suggested that linguistic diversity is produced by drift and selection acting together. To illustrate more directly the role of selection pressures on linguistic diversity, we designed an agent-based simulation intended to serve as a simple existence proof. The simulation allows us to examine how the resulting communication systems change as a function of drift and selection pressure. In this admittedly idealized and simplistic simulation, we find that even a small amount of selective pressure acting on communication systems can drastically impact the amount of diversity that results.

In our simulations, as in many others, languages (i.e. grammars) are often defined as feature vectors (e.g. Chater, Reali, & Christiansen, 2009) and language change is quantified as changes to the values of these feature vectors (e.g. Nowak, Komarova, & Niyogi, 2001). Here, we defined language grammars as existing on just two dimensions, with each dimension taking on a real value between 0 and 1. Thus, each language L is defined as a two-element feature vector, (f_1, f_2). Each speaker/comprehender (agent, A) is defined as a pair of vectors, one corresponding to a particular value of the two-feature language spoken by that agent, and one

corresponding to the agent's physical location in a simulated terrain, defined by a 100×100 square map: $A = \{(x, y), (f_1, f_2)\}$.[5]

We initialized the simulation by starting 50 agents in the centre (location $x = 50$, $y = 50$) and then diffused according to a set of migration rules. All agents at the beginning spoke the same language, $L_{original} = (.5, .5)$, in accord with the assumption of monogenesis of human language.
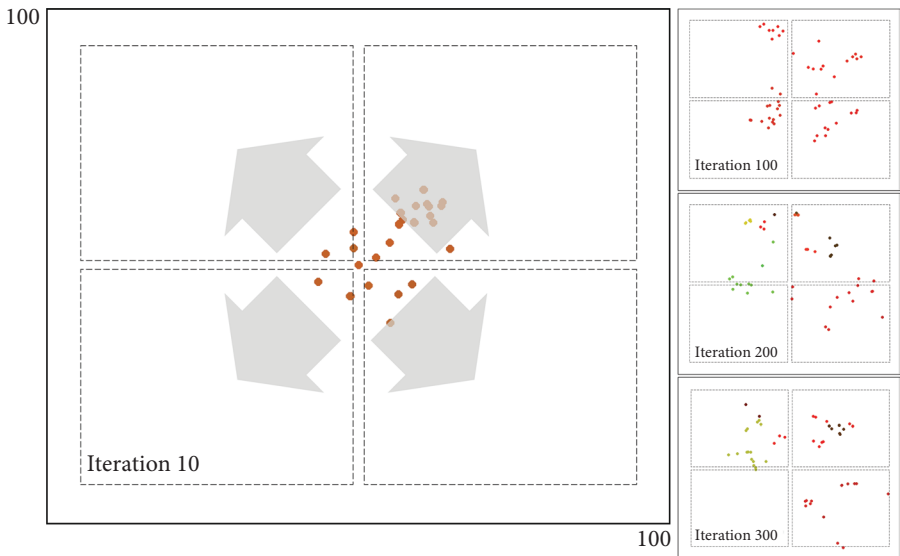
Figure 1. Left panel: A 100×100 grid traversed by 50 agents. Early in a simulation run (e.g. iteration 10), the agents are still near their origin, and their languages are relatively similar. Right panels: As the simulation proceeds, languages drift apart. The dotted lines demarcate four quadrants with different selection pressures (simulation 2). For example, the top-right quadrant of the grid favoured drift towards higher f_1 values; the lower right quadrant favoured lower values of f_2. The other two regions were given the remaining selection possibilities (low f_1 value, high f_2 value). Colour is determined by the f_1 and f_2 values: different colours show the formation of "dialects."

On each iteration, we selected a random set of at most 5 agents that were within 10 units of each other and randomly moved them in any direction on the grid (maximum ± 20 steps). In addition, agents could communicate provided they could 'understand' one another. Agents were deemed to understand one other as

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5. The editors correctly observed that our implementation assumes independence of grammatical features. Morphosyntactic features of real languages tend to be interdependent.

long as their languages differed by less than the 'talk threshold' – the Euclidean distance between their language vectors, here set to √2/6 (i.e. 17% of maximum distance; in reality, of course 'understanding' is not an all-or-none phenomenon). Finally, we also used language differences to decide migration patterns. We added the constraint such that agents only migrate together if they have languages within a distance of √2/3 (i.e. 33% of the maximum linguistic difference). This constraint implements the idea that agents in the same region of the landscape who speak the same language are a social group.

We also implemented a notion of linguistic 'conformity' – talk like the others talk (Keller, 1994) with agents changing their language to be more similar to each other when they spoke. Each time agents communicated, they shifted their languages towards the mean language between them (using a simplifying assumption of symmetric social roles). Finally, drift was implemented as the proportion of the unit space (0–1) that an agent could shift its language up or down on each turn. As an example of the kinds of small changes or tweaks such drift corresponds to, consider the choice of using 'whom' vs. 'who' in the accusative, or the choice between the prescriptively correct 'between you and me' vs. the colloquial 'between you and I.' The magnitude of the drift parameter controlled the freedom the agents had to 'play' with language.

We ran the simulation for 500 iterations using 50 agents and explored a range of drift and selection parameters. At each iteration, one group of agents (maximum $N = 5$) was permitted to migrate on the 100 x 100 terrain. Also at each generation, all agents were permitted to "communicate" with a group of agents (maximum 10) that were within a 10-unit distance around it, and that had sufficiently similar languages (as described above).

The results from simulations varying the amount of drift (k, using drift value of $\pm kU(0,1)$) and selection-pressure are shown in Figure 2. Not surprisingly, drift has a large impact on language stability. When drift is very small (i.e. there is almost perfect language transmission from one generation to the next), the language fluctuates around its initial state of (.5, .5). When drift is increased to 5%, languages become wildly unstable, oscillating radically from one time-step to the next (a situation that would prohibit effective communication). With an intermediate amount of drift (1%–3%), the languages diversify while maintaining stability.

We next examined the effects of selection pressure on linguistic diversity. Selection pressure was implemented by differential copying of languages that happened to be most adaptive to the environment in which the language happened to find itself. To simulate different environments, we divided the 100×100 grid into four quadrants. In each quadrant, languages with particular feature-values were 'favoured'. For example, in quadrant 1 (top right), languages which happen to have high values on feature 1 would be favoured, with no selection pressure applied to
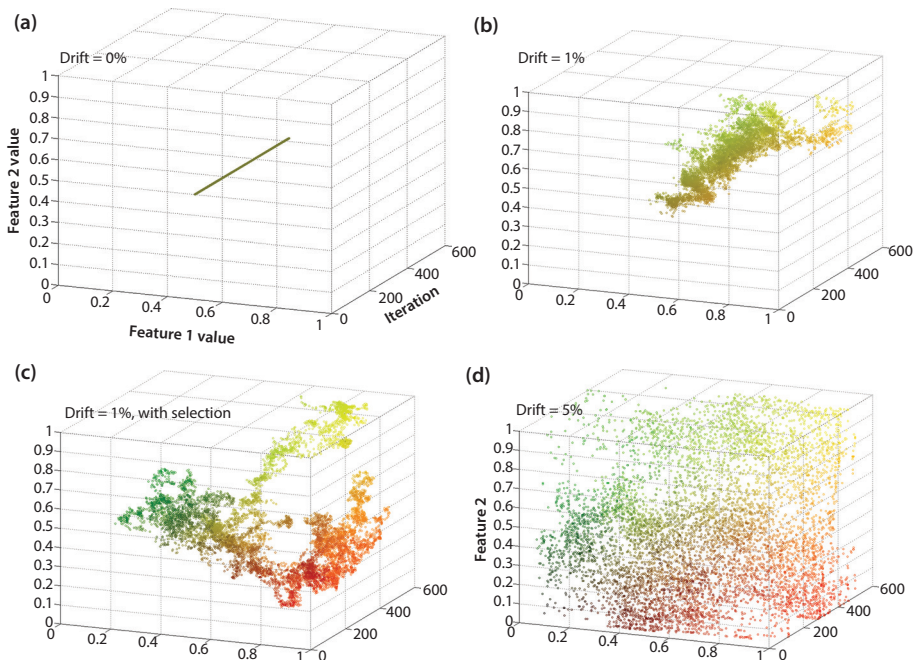
Figure 2. Example runs of the simulation under different parameter values. Colours are only for illustration, and are coded using the feature values, facilitating the observation of dialect formation over time (iterations). See text for details

feature 2. The selection of particular language-variants was done by increasing the likelihood of agents imitating those using a more adaptive feature than a maladaptive or neutral one. Although we use the word *imitation*, the process should not be thought of as goal-driven. Imagine an environment in which certain phonemes are poorly transmitted, e.g. phonemes with high-frequency components in a tunnel with a T intersection (Imaizumi, Kunimatsu, & Isei, 2000). Individuals using those phonemes, all other things being equal, would be less likely to be imitated than those using alternate forms that are better transmitted.

The effects of selection can be seen in Figure 2 and Figure 3. In Figure 2, each point represents the language state of an agent A and its (f_1, f_2) vector, across time (iterations). Figure 2A shows that, when the simulation has no drift, the two language features stay fixed at their initial values. However, when some drift is added (a 1% perturbation during each interaction: Figure 2B), the languages can begin to explore the parameter space, and come to form agent 'dialects'. With too high a drift value (5% perturbation: Figure 2D), dialects cannot readily stabilize and languages fluctuate rapidly from iteration to iteration. Things change substantially when the "environment" creates diverse selection pressures. A selection pressure allows

languages to rapidly diversify into dialects, even with minimal drift (Figure 2C). Holding drift rate constant, even a small selection pressure allowed the space of possibilities to be explored more quickly, with the 'languages' slowly converging on patterns better adapted to particular regions of the grid (Figure 3).

Allowing languages to adapt to the environment rather than just change as a function of drift has a profound effect on the level and type of linguistic diversity. On this account, patterns of linguistic diversity can be explained not only in terms of shared history and common descent, but in terms of environmental pressures: languages spoken in similar social and ecological environments may become more similar as they adapt to common pressures. Even if the adaptive pressure is small, it can have drastic long-term effects on patterns of linguistic diversity. Our simulation shows how linguistic diversity can arise when drift combines with even a pinch of selection. Although highly idealized – the grammar only has two independent grammatical features and assumes symmetric communication – we view this simulation as a starting point for exploring questions concerning the sources of linguistic diversity.
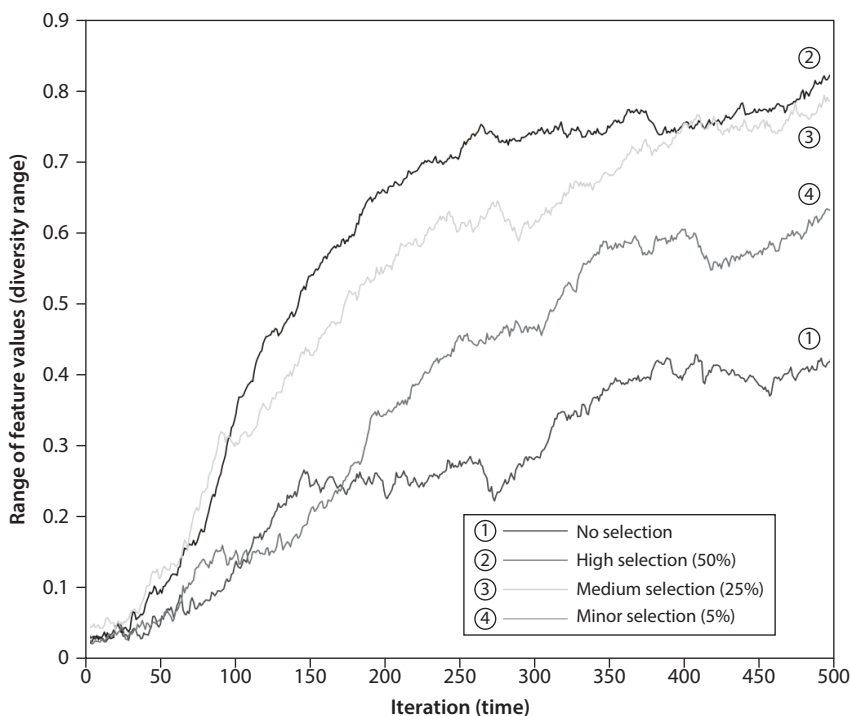
Figure 3. The results of four different runs using 1% drift with varying selection rates. The y-axis shows the average range in f_1 and f_2 across 5 runs of the simulation. Higher scores indicate greater linguistic diversity

4.   The role of drift and selection in explaining linguistic diversity

Let us return to the biologist faced with observing differences in beak shape between species of finches. After describing and quantifying the variation, a logical next step would be to understand what factors may be responsible for the observed differences. An obvious place to look in the case of beak shape would be the animal's diet and availability of food sources that are more easily or more difficult to access using various beak shapes. Once the mapping between beaks and diet is determined, one can look at how changes in availability of food impact the mortality and reproduction rates of individuals with varying beak shapes across and within a species – direct evidence of a selective pressure on beak shape. In other words, beak shapes represent evolutionary adaptations to specific ecological environments. As we elaborate in more detail below, we believe that substantial progress in understanding linguistic variability can be made by applying an analogous approach to language and treating different languages as adaptations to different environments.[6]

The idea that there may be some systematic relationship between language and aspects of the environment, particularly the social, cultural, and technological aspects of the environment, is not a new one. In fact, speculations on the connections between particular grammars and culture were so common (see Enfield, 2004; Perkins, 1992, for discussion), that in his 1921 book, Sapir admonished all attempts to link language types to culture:

> It is difficult to see what particular causal relations may be expected to subsist between a selected inventory of experience [and] the particular manner in which the society expresses all experience.   (Sapir, 1921, p. 233)

> [A]ll attempts to connect particular types of linguistic morphology with certain correlated stages of cultural development are vain. Rightly understood, such correlations are rubbish […] Both simple and complex types of language of an indefinite number of varieties may be found spoken at any desired level of cultural advance. When it comes to linguistic form, Plato walks with the Macedonian swineherd, Confucius with the head-hunting savage of Assam.
> (Sapir, 1921, p. 234)

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6.   It is important to note that there is no requirement for every observed trait to be functional or predictable from some aspect of the environment. Indeed, conditional universals of the form "If a language has property A, it most likely has property B," are a prime example of how a selective force acting on property A may also affect property B (which in turn may become exapted for other functions).

At the same time, Sapir also noticed that language changes were not random, but exhibited what he referred to as the "drift to the invariable word," noting for example that "striving for a simple, unnuanced correspondence between idea and word that [is] very strong in English" (Sapir, 1921, p. 180). Sapir believed that these changes were due to forces internal to language: "Language moves down time in a current of its own making. It has a drift" (p. 160) and that while the lexicon of a language is naturally shaped by the needs of its speakers, "its line of variation, its drift, runs inexorably in the channel ordained for it by its historic antecedents" (p. 232).

The apparent directionality of language change was also described by Jespersen, who made similar observations of language apparently tending to become, over time, more analytic, but, unlike Sapir, Jespersen saw in these changes a kind of progress: "[There is a] progressive tendency from inseparable irregular conglomerations to freely and regularly combinable short elements," arguing that in "modern" languages, words are shorter, "thus involving less muscular exertion and requiring less time for their enunciation", their formation (i.e. morphology) and syntactic use (i.e. recombination) "present fewer irregularities" and "[t]he clumsy repetitions known under the name of concord have become superfluous" (Jespersen, 1922, p. 364). For a more elaborate discussion of this so-called principle of economy, see Croft (2002).

As we shall see (and as noted by Trudgill, this volume, and Trudgill, 1988, 1989, 1993, 2001a; as well as by Christiansen & Chater, 2008; Dahl, 2004; McWhorter, 2001; Nettle, 1996, 1998a, 1998b; Perkins, 1992; Wray & Grace, 2007), there really is something to this observation. But in ascribing progress to these apparently directional language changes, Jespersen makes the same mistake as someone who, on observing the apparent advantage of the giraffe's long neck, concludes that zebras, antelopes, and the decidedly short-necked gnus, are all at different stages of progress toward giraffean necks. The proper analysis, of course, is that long necks are an adaptation to a particular environment – a niche. Just as we can explain the emergence of and changes in physical traits as responses to selective pressures from the environment, we can conceive of culturally-transmitted traits (of which language is but one) as reflecting adaptations to particular niches. The philosopher Ernst Cassirer expressed a similar idea, writing:

> Every classification is directed and dictated by special needs, and it is clear that these needs vary according to the different conditions of man's social and cultural life […] Languages vary with the functions they fulfil in the cultures in which they are spoken.
> (Cassirer, 1962, p. 136)

The use of language like 'special needs' smells of teleology, but this should not detract from the more general point of an adaptive fit between the language and

the environment in which it is used. One clear case comes from the use of language to pick out entities worth communicating about. Many words, concrete nouns in particular, name specific objects, and insofar as there are cross-cultural differences in what needs to be named, the lexicon adapts accordingly. But what of grammatical factors such as verb agreement, cases, and other features that apparently serve purely linguistic functions? What 'special need' might these fulfil and what possible conditions of 'man's social and cultural life' might vary to as to make some of these linguistic features variously adaptive in different environments?[7]

When faced with a question of this form in the biological domain, we are aided by a large knowledge base, compiled through observation and theorizing, about functions conferred by various phenotypes. We see birds using their beaks for eating, and we make the reasonable assumption that differences in beak shape may have something to do with obtaining food. We observe leopards hunt and theorize that their coat markings are an adaptation to avoid detection by prey. In inquiring about the functional significance of specific linguistic features, we know far less. What are inflectional evidentials *for*? Person agreement? Complex hierarchies of demonstratives?[8]

Rather than focusing on explaining why some languages have specific features such as complex person agreement, while others do not, one can ask whether particular *types*[9] of languages are more likely to be found in one environment or another. What aspects of environment, of Cassirer's 'social and cultural life' are the important ones? Might it matter, for example, if a language is spoken by a thousand versus a million speakers? In an artefact-rich or largely natural environment? In a *society of intimates* or a *society of strangers*? If it borders many languages or is geographically isolated?

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7.   See LaPolla, this volume, for one suggestion.

8.   A broad objection to this idea on the grounds that it is impossible to explain language functionally because it is some type of perfect and non-functional artefact (Brody, 1998; Lasnik, 2002; Piatelli-Palmarini & Uriagereka, 2004) makes little sense to us and we cannot think of any other domain in which an analogous proposition would be seriously entertained.

9.   We focus on types because given how little we still know about the functional role of specific features – we are only now starting to systematically catalog and quantify linguistic variation on a large scale (Dryer & Haspelmath, 2011) – it may be premature to theorize about the functions of any specific feature and a more productive approach may be one that focuses on broader distinctions as detailed below.

5.   The fit of languages to their environments: The importance of learning mechanisms

A useful starting place for understanding the fit between languages and their environments is the self-evident but often overlooked observation that languages need to be learnable (Christiansen & Chater, 2008; Deacon, 1997). By definition, an unlearnable language cannot exist. But while all natural languages are constrained by what can be learned by infants, only some languages are additionally constrained by what can be learned by adults. Insofar as children and adults differ in the kinds of linguistic devices they learn most effectively, an immediate prediction is that languages with a larger number of non-native speakers and ones in which people commonly talk to strangers (the so-called 'exoteric' niche (Thurston, 1989; Wray & Grace, 2007), analogous to Trudgill's use of the term *societies of strangers*; see this volume) will come to have simpler morphological paradigms. Trudgill articulated a version of this hypothesis in perhaps the clearest way:

> Just as complexity increases through time, and survives as the result of the amazing language learning abilities of the human child, so complexity disappears as a result of the lousy language-learning abilities of the human adult. Adult language contact means adult language learning and adult language learning means simplification, most obviously manifested in a loss of redundancy and irregularity and an increase in transparency.   (Trudgill, 2001a, p. 372)

Similar arguments, focusing on the role of the language population on morphological complexity, have also been discussed by McWhorter (2001, 2002, 2007), Wray & Grace (2007), and a number of contributors to Sampson, Gil, & Trudgill (2009).

A strong test of this hypothesis on a large scale, however, only became possible with the publication of large corpora of grammatical features (e.g. Dryer & Haspelmath, 2011), which allowed us to examine whether morphological complexity is actually predicted by factors related to exotericity, namely the number of speakers. It turns out that simply knowing how many people speak a given language, or how widely a language is spoken around the world (in km²), we could predict, sometimes with very high certainty, some of its grammatical features. For example, we found that languages with many speakers tended to: (1) be less synthetic or fusional in their overall structure, (2) have simpler noun and verb agreement systems, (3) have simpler overall verb morphology, (4) have fewer nominal cases, (5) lack inflectional evidentials, future tense, and aspect markers. Population, as well as geographic spread and number of bordering languages – the three proxy factors we used to quantify exotericity – predicted over 20 grammatical factors related to morphology (controlling for language family and geography and

using Monte Carlo analyses to deal with Galton's problem of non-independent sampling; Lupyan & Dale, 2010). Overall, our results showed that given the choice of expressing a certain semantic distinction using morphological or lexical means, exotericity was positively correlated with lexical strategies and negatively correlated with morphological encoding of these distinctions. We framed the results in terms of the *Linguistic Niche Hypothesis* (Lupyan & Dale, 2010), arguing that they are indicative of languages evolving to fit the learning constraints of their learners. As a language spreads more widely, and is learned by more adult non-native speakers, its morphological structure tends to simplify. This is the very process Trudgill envisions taking place:

> Adults [learners …] necessarily subject new languages that they are learning to the process of pidginization… an increase in transparency, by which is meant an increase in forms such as *eye-doctor* as opposed to *optician,* and *did* instead of *went*. Imperfect learning, that is, leads to the removal of irregular and non-transparent forms which naturally cause problems of memory load for adult learners, and to loss of redundant features. This can in turn lead to an often dramatic increase in analytic over synthetic structures.   (Trudgill, 2001b, p. 66)

Our findings, across over 2,000 languages, suggest that such a process is actually at work. As a further test of the hypothesis that exotericity, particularly adult learning, increases transparency, consider differences between American and British English. American English is used in a considerably more exoteric setting, as measured by, for instance, the relative proportions of non-native speakers.[10] According to Ethnologue (Gordon, 2005), about 20% of US-English speakers are non-native English speakers, versus about 5% British English speakers in the UK (though the latter number is rapidly increasing). We would therefore expect American English to show a preference for more regular/transparent forms. Following Trudgill's example, the top panel of Figure 4 compares the more transparent *eye-doctor* to the more synthetic/derivational form *optician* in American and British English (Corpus of Global Web-Based English; Davies, 2013).[11]

One may wonder if such differences are a symptom of British English being simply more conservative in comparison to American English, perhaps owing to its smaller speaking population. Such an explanation, however, could not account for why British English has apparently been *more* willing than American English

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10.   It may be objected that it was British rather than American English that was spread around the world in colonial times. This is true, but its learning by non-native speakers, and hence the changes which we hypothesize to be caused by this learning, were largely outside the boundaries of England proper.

11.   The more appropriate comparison to *eye doctor* may be *optometrist* or *ophthalmologist*.

to replace the more regular form of *lighted* with the morphologically irregular *lit* (Figure 4 bottom). Compared to British English, American English shows a resistance to the irregularization trend that is replacing *lighted* with *lit*. As shown in Figure 5, while *lit* overtook *lighted* in 1912 in UK English, it took until 1950 for *lit* to overtake *lighted* in US English; see Dale & Lupyan (2012) for further discussion. A common explanation for both patterns is that American English has a stronger affinity for simpler morphology and greater form-to-meaning transparency.
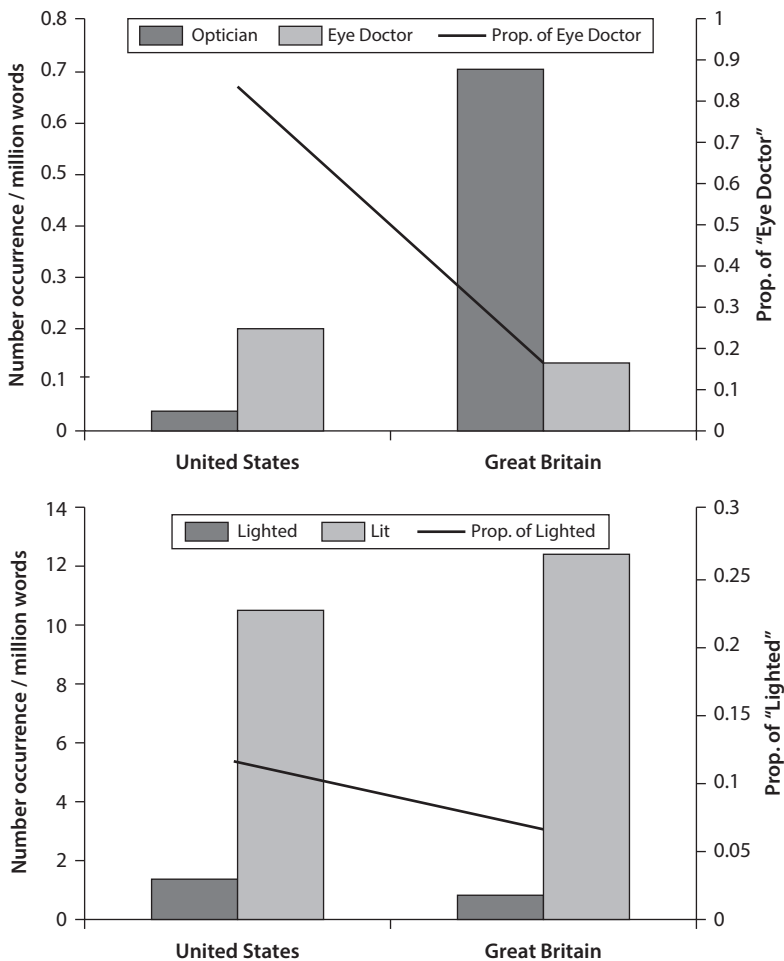
Figure 4. Number of occurrences per million of *optician* and *eye-doctor* (top) and *lighted* and *lit* (bottom) in American and British English. Line shows the proportion of the more analytic/regular form
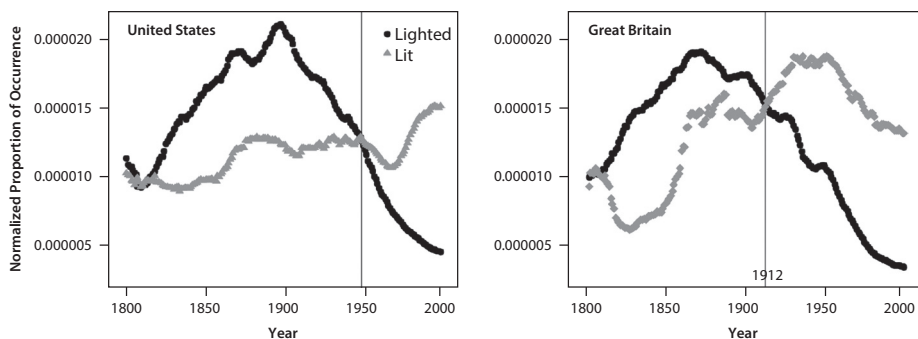
Figure 5. Google N-Gram analysis of the trajectory of *lighted* and *lit* for the US (left) and UK (right). US English shows a resistance to the irregularization of the verb

The above analyses, although suggestive, are clearly preliminary. More rigorous work is needed to determine the degree to which there is a systematic bias in American English for more transparent form-to-meaning mapping, and the degree to which the results reflect more universal trends. For instance, one might make the opposite prediction for Quebecois French as compared to metropolitan French insofar as Quebecois became more insulated from influences of outsiders. Beyond the specifics, however, our larger claim is that differences between American and British English can be understood in part as the consequence of languages – the varieties of English, French, etc. – adapting to slightly different niches.

If one assumes that children are better learners of opaque form-to-meaning mappings than adults, it is easy to see how non-native speakers in a language act as a kind of bottleneck. But what may be less obvious is how the presence of non-native speakers can impact the native-speaking population. Languages need to be learned by their speakers (we deliberately avoid the term *acquire* commonly used when referring to language learning in infancy because it implies that early language learning is not really learning). The exact form of a language a child will learn depends on the input. If non-native speakers speak differently from native speakers, then their input to children may affect – if only slightly – the language the child goes on to learn. Situations in which the child's language models are similar to those of non-native speakers may be quite common. For example, in a survey of 188 individuals in Senegal who listed Bambara as their native language, Bambara was the father's native language in 16%, the mother's in 19%, the native language of both parents in 26%, and the native language of neither parent in 39% (Calvet, 2006). Although children are learning Bambara from a young age and are, in theory, fully capable of learning whatever morphology it possesses, in such

a multilingual environment, much of the language Bambara children hear may come from non-native (or non-fully native) speakers. Thus, whatever aspects of Bambara were difficult for the parents to learn would be more likely to be passed on to the offspring in a revised form.[12]

To investigate further the influence of even a small amount of exposure to non-native speakers, Dale & Lupyan (2012) elicited acceptability ratings of overregularized sentences such as *He speeded down the road* and *They sneaked around* from 95 native American English speakers from around the country. The results showed that the degree of acceptability of such sentences (partialing out several factors like level of education) was predicted by the amount of childhood exposure to non-native English speakers (derived from self-report and US Census records based on the proportion of non-native speakers in the US state where they grew up). People who reported hearing more non-native English were more tolerant of over-regularized forms. In the same paper, we describe a series of agent-based simulations that show how even a small bias against complex morphology can impact the level of morphological specification that a language comes to possess.

Some regions of the world such as Papua New Guinea are hotspots of linguistic diversity. Given the small geographic extent and relative similarities in cultural practices within such regions, one may wonder why linguistic diversity should be as high as it is. As pointed out by Nettle (1998b), these hotspots of linguistic diversity tend to be correlated with long growing seasons and ecological stability. Small societies can be more self-sufficient with less need for trade, which contributes to language diversification via drift. An additional source of variability, however, may owe itself to active diversification. Language is a strikingly powerful marker of group identity; even within a language, accented speech in some cases serves as a marker of affiliation more than physical appearance (Kinzler, Shutts, DeJesus, & Spelke, 2009). It has been noted that this may be especially important in small societies. For example, Crowley and Bowern cite statements from the Sepik region of Papua New Guinea like "It wouldn't be any good if we all spoke the same. We like to know where people come from" (2010, pp. 14–15). Put in an adaptationist framework, in cultures in which it is especially important to mark group identity (e.g. due to an especially strict in-group bias), language diversification may play an important role as a shibboleth. Although this mechanism is

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12.   We do not mean to suggest that infants simply copy what they hear. All language learners generalize beyond their input. But if, for example, a particular morphological distinction is simply absent from the input, then it is unlikely that the learner is going to reinvent it on their own.

distinct from the learnability biases that we have focused on, it too suggests that language diversification cannot be explained through drift alone.

6. The child-adult learnability trade-off

We have argued that while all languages are necessarily constrained by what can be learned by infants, only some – the languages occupying the more exoteric niche – are further constrained by the limitations of adult language learning. Morphology, being one domain in which adults struggle, appears to simplify in languages constrained to be learnable by adults. But why does complex morphology arise in the first place? It has often been noted that languages are more complex than what is apparently needed for communication (e.g. Premack, 1986), and as Gil (2009) argues, the extra complexity does not seem necessary given how much can be accomplished with languages lacking these "baroque accretions" (see McWhorter, 2001 for discussion). From a linguistic-niche perspective, one possible answer to this puzzle is that complex surface morphology and paradigms that present difficulties for the adult learner may actually *benefit* child learners. Consider, for example what Jespersen referred to as "clumsy repetitions known under the name of concord", more familiarly called agreement. Any system of agreement (e.g. between nouns and verbs, nouns and adjectives) is redundant in the sense that if the noun makes it clear who the subject of the sentence is, marking it additionally on the verb becomes unnecessary. But perhaps such repetition and the redundancy it imparts provide learning benefits to children. While agreement (as well as grammatical gender, complex demonstratives, morphologically encoded aspect, evidentiality, etc.) can pose challenges for adult L2 learners, perhaps it can *facilitate* language learning by children by providing them with additional cues helping to ground the linguistic stream to the goings-on in the environment. One rationale for this proposal is that in comparison to adults who can deploy powerful pragmatics, theory-of-mind, and general world knowledge to make sense of partially ambiguous utterances, children do not yet have these mechanisms at their disposal. Thus, encoding aspect, gender, evidentiality, etc. grammatically (with its corresponding increase in redundancy) may baffle the adult, but be beneficial to the child learner.[13]

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13. As a demonstration that languages spoken in more esoteric niches are indeed more redundant, Lupyan & Dale (2010) quantified informational redundancy in terms of the Huffman codes which can be approximated by zipping a text file. Redundancy is proportional

An immediate objection to the idea that richly inflected languages are better adapted to child learners is that it seems to suggest that children ought to be better at learning morphologically complex (and more opaque) languages than simple languages such as English. There is indeed some evidence of differences in learning rates across languages (e.g. Slobin & Bever, 1982), and some evidence of faster learning by children of more complex inflectional systems. For example, Devescovi et al. (2005) observed that Italian children require fewer words to extrapolate grammatical regularities of Italian compared to children learning English, a difference the authors ascribed to the richer inflectional system of Italian, which provides the children with increased learning opportunities. However, such cross-linguistic differences in language learning appear to be fairly minor. Much more substantial cross-linguistic/cross-cultural differences can be found in the amount of language directed at prelinguistic children (e.g. Johnston & Wong, 2002; Richman, Miller, & LeVine, 1992; Tamis-LeMonda, Song, Leavell, Kahana-Kalman, & Yoshikawa, 2012; Vogt & Mastin, 2013). An intriguing possibility is that such differences interact with the grammar of the language being learned by the children. If more richly inflected (and hence more redundant) languages are especially well adapted for child learning, then perhaps they can be learned with less input. As a language becomes exposed to the learning constraints of adults and loses some of the inflectional richness (and with it, redundancy), children require more input to learn it. There is now considerable evidence showing how sensitive English-learning children are to reduction in input (Hart & Risley, 1995; Hoff, 2003; Hurtado, Marchman, & Fernald, 2008; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Direct comparisons of input sensitivity between languages – needed to test the outlined hypothesis – are lacking at present.

To make more concrete the idea of languages adapting to the constraints of child learning, consider two further examples: (1) There is clear evidence that processing sentences with deeper embeddings requires greater working memory (Lewis, 1996) which, in the case of young children, is in short supply (e.g. Gathercole, Pickering, Ambridge, & Wearing, 2004). This may produce interesting trade-offs between morphological and syntactic complexity. Insofar as morphological complexity tends to allow for simpler syntax (particularly in the case of syntactic embedding, see Evans & Levinson, 2009), one can ask whether languages constrained only by child learning may tend toward syntactic structures with lower working memory requirements. The results of Lupyan & Dale (2010)

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to the degree to which the file can be compressed. We found that, indeed, languages spoken by fewer people (typically those with few non-native speakers) were considerably more compressible, i.e. had greater redundancy.

are consistent with this possibility, but more targeted investigations are necessary. (2) We have discussed inflectional systems in very broad strokes, speaking of richly inflected languages versus ones with little inflection, but of course there is substantial variability in the form those inflections take. One difference is whether the inflections take the form of suffixes or prefixes. According to WALS, there are far more languages that are biased (moderate to strong) for inflectional suffixing (529 languages from 87 language families) compared to prefixing (152 languages from 31 language families). Based on these data, one could conclude that suffix-ation is, in some way, more natural. However, if we look at the demographics of the languages that use suffixation versus prefixation, a different picture emerges. Of the 18 language families that have both prefixing and suffixing languages accord-ing to WALS, the suffixing languages have a mean population of about 3000 speak-ers, and the prefixing languages about 6500 speakers. Languages that on our view are adapted for child learning may favour suffixes, while those that have been more strongly shaped by adult learning may favour prefixes.[14] Indeed, there is some evidence that suffixes are easier to learn for infants than prefixes (Kuczaj, 1979; Slobin, 1979, 1985), and there is some indication from experimental studies that prefixes are easier to learn for adults compared to suffixes (Frigo & McDonald, 1998; MacWhinney, 1983; St. Clair, Monaghan, & Ramscar, 2009). A similar mis-match between 'naturalness' according to number of languages/language fami-lies demonstrating a given trait and language demographics is basic word order. Despite SOV being the most widespread word-order in terms of absolute num-ber of languages and somewhat more prevalent in terms of number of language families, when examining the 16 language families that have both SOV and SVO languages we find that the mean population of SOV languages is about 16,000 and the mean population of SVO languages is bout 33,000. This pattern suggests that SVO languages may be favoured by adult learners.

In summary, although there now appears to be converging evidence for the connection between adult language learning and morphological simplification, the reasons for languages having complex morphological systems to begin with are more puzzling. We have argued that rather than being non-functional 'baroque accretions,' complex morphological systems may play a role in facilitating language

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14. Indo-European languages are omitted from this analysis because they only have inflec-tional suffixing. One may wonder why, given the relative exotericity of Indo-European lan-guages, they lack prefixing if it provides a learning benefit. Our uninformed guess is that this is a case of path dependence. Inflectional prefixes were outside the variation of the Indo-European language family and thus could not be selected.

learning by children and are thus an adaptation to the esoteric niche. This proposal remains speculative and awaits more rigorous empirical tests.

7.   Ecological constraints on language structures

In discussing the environment to which languages adapt we have focused on social and demographic factors, such as the effect of a language being constrained by child learners or a combination of child and adult learners. We have said little about the ways in which grammars may adapt to exogenous factors such as the physical environment in which the language is learned and used. Below, we consider several examples from the domain of spatial language.

Although all languages have ways of expressing the relative locations of objects or people, the precise means of doing so differs (Levinson & Wilkins, 2006). One source of such difference lies in the system of demonstratives, terms such as *this*, *that*, *here*, and *there*. In some languages, like English, the demonstrative systems are relatively sparse and underdetermined. To make sense of an expression such as *I am here*, one needs to know quite precisely the context of the utterance. Does the speaker mean *here* in the city? *Here* in the building? *Here* in the office, *here* at the restaurant? Of course, one can optionally add this information, but nothing about the word *here* specifies where *here* is. Such systems contrast with systems that require speakers to encode relative location much more precisely using demonstratives and other devices such as deictic adverbs (e.g. Denny, 1978, 1982; McWhorter, 2002, for a discussion of English as compared to other Germanic languages). To what degree may such differences reflect adaptations to different environments? Denny (1978) proposed that certain spatial systems seem particularly well-suited for describing relative locations in artefact-sparse environments, in which the familiar English system of demonstratives and deictic adverbs would appear to fail. In English, we regularly refer to regions of space with phrases such as *That one across the street* or *To the left of that mailbox*. But such expressions would be of limited use in an environment in which no such reference points exist. One solution is to centre the space on speakers and listeners instead. As Denny writes:

> [In] a natural environment of non-human spaces one way to relate space to human activity is to use deictic spatial concepts, to center space on the speaker or other participants. In a man-made environment this is less necessary […] we can use non-deictic locatives (down the road, around the corner) which will relate space to human acts quite directly since the places mentioned are all artefacts designed to aid such acts.   (Denny, 1978, p. 80)

Is the presence of complex demonstrative systems in some languages simply a coincidence? Or might they be seen as an example of a linguistic adaptations

to a particular ecology? No one, to our knowledge, has looked at relationships between ecologies and language structures. In a feasibility study, we used the Standard Cross Cultural Sample (SCCS; White, 2007), an ethnographic database of 186 cultures, to test the generality of Denny's (1978) observation inspired by the study of spatial terms in Eastern Eskimo. Without the ability to say things like *next to the mailbox*, the language is, on the present account, under a selective pressure to develop complex speaker- and listener-centred spatial terms (that are unnecessary in an object-rich environment). We undertook a preliminary analysis in which we combined the biome factor from SCCS (desert, tropics, tundra, etc.) with the number of spatial-term distinctions coded by WALS (because SCCS does not include information on specific languages, this analysis was done at the level of language families). Not only did languages spoken in the five biomes differ significantly in the complexity of demonstratives, but the languages spoken in the most sparse biome (tundra and taiga) had systems of demonstratives with reliably more remoteness distinctions compared to languages spoken in other biomes. These preliminary results hint at the wealth of patterns that may be found by larger-scale theoretically-guided analyses aiming to understand how particular language structures – morphological, syntactic, semantic, and phonological – interact with ecological influences. At the same time, however, one must be cautious in performing such analyses and recognize that most patterns of linguistic diversity will not lend themselves to simple explanation by ecological factors.

8.   Conclusion

Our main claim is that it is impossible to understand why there are so many languages and why languages differ as they do without taking into account selective pressures that have operated and continue to operate on languages. These pressures can be both endogenous, such as cognitive limitations (which may differ quite drastically for child and adult language learners with consequences for languages with many versus few adult learners), and exogenous, such as ecological factors in which the language is used.

At present, we would characterize our state of knowledge in understanding what these pressures are, and how they operate, as minimal. However, we see exciting possibilities in research programs that combine descriptive linguistic datasets with anthropological data, ecological information, literature on child-language, and finally, studies that use artificial-language learning paradigms to study experimentally how languages are influenced by the cognitive constraints of the learner (e.g. Ellefson & Christiansen, 2000; Monaghan, Christiansen, & Fitneva, 2011; St. Clair et al., 2009), and by ecological factors (e.g. Enfield, 2004; Nettle, 1998b). Progress can be further hastened by abandoning the assumption that all languages

are 'broadly' similar and equally complex (see Evans & Levinson, 2009; Sampson et al., 2009, for discussion), and stressing the connections between diachronic and synchronic linguistic variation and socio-demographic variation, insofar as these connections can inform our understanding of how linguistic systems react to environmental challenges.

Most importantly, language – both the human capacity for language, and specific grammars – must be viewed as functional systems shaped by cultural evolution. There does not appear to be any reason for excluding language from functionalist approaches that are so useful in explaining other evolved traits.[15] A dictum of Dan Slobin's makes for an apt conclusion:

> The acquisition and development of any linguistic form or construction must be considered in the light of its 'functional load' within the language and speech community. (Slobin, 1997, p. 35)

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Grammar and the field of linguistics

On becoming an object of study

Legitimization in the discipline of Linguistics

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It is widely understood that the socio-historical contexts of languages have a direct bearing on their structures and on the types of stance that communities take in relation to them. Within the discipline of linguistics these socio-historical contexts and their impacts on communities' use and understanding of language are generally referred to as sociolinguistic factors. Meanwhile within descriptive linguistics the structure of language remains core. This is evidenced in the shape of university course design, structures of textbooks, and in how linguistic knowledge is recorded. In this paper we seek to map the relationship of the socio-historical context of linguistics to the languages that we study and in doing so, shift the focus so that the socio-historical context becomes central. Through this process the shape of the languages themselves is altered.

We present a case study that compares linguistic and community perspectives on language boundaries in Milne Bay Provence, Papua New Guinea, and explore the processes through which the languages are created as objects and then become emblematic of culture and identity. We discuss the strong links that communities make between language, place and spirituality and consider the opportunities that these perspectives hold for language descriptions. Finally we consider how we, as linguists, can hold multiple perspectives on language and create culturally safe partnerships with communities that result in materials consistent with speakers' goals for their language.

1.   Introduction[1]

The chapters in this volume address factors that contribute to the *shaping* of language. In preparing them, the writers were invited to consider "if and how

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languages are shaped by the environment their speakers live in" and to consider this question in regards to "possible relationships between the structure (all aspects) of a language and its social, cultural, historical, and natural environment". In this chapter we expand on this, by focussing not only on the social, cultural and political environments of language communities, but also on linguistics as a discipline. We offer examples of the effects of a linguistic framework on the shaping of languages as objects of study.

This chapter takes a critical view, exploring the socio-historical relationship between linguistics and the languages that are studied. It considers how it is that languages become an object of study by asking the following questions:

– What does linguistics view as central to language(s)?
– What do speakers and communities view as central to their language(s)?
– What is linguistics missing out on?
– What, if anything, should linguists do about this?

These questions are explored by considering the knowledge created through the socio-historical relationships between linguists and speakers/communities. A case study from Papua New Guinea, reflecting the areas of knowledge and experience of the authors, is used to illustrate and contextualize this chapter. This case study reflects our experiences as linguists who have often felt torn between the demands of linguistics and our experiences in remote communities (Stebbins, 2012; Easton, 2007). The aim of sharing this data and our stories is to highlight ways of thinking and knowing about language that we have encountered in our research and that have enriched our understanding of language and human communication.

This chapter has grown out of our own experiences working with multiple communities throughout the Pacific, as well as the sharing of stories and experiences with colleagues. Although these kinds of conversations do not always make it into the published literature, they are core to the experiences of linguists and communities alike. Language research within communities creates a sense of unease as the various participants bring their own goals, assumptions, and ways of knowing. As linguists we arrive in communities with descriptive and documentary expertise and tasks, as well as a desire to make a positive difference through the work that we do. The unease can be unexpected, but also provides the opportunity to engage in a deeper experience of language. While this takes us into knowledge that is beyond the scope of descriptive linguistics and the expertise our training typically provides, it can enrich the findings and relevance of our research. We do not suggest that expertise is necessary in all the branches of knowledge that communities connect to language. However, by acknowledging the broader conceptualization of language that is a reality for many of the communities where we work, we allow for more genuine collaboration. We come to

see the work of 'descriptive linguistics' sitting within the cultural framework of the community, and therefore as a skill set that we can offer communities. In this chapter, we map out the shape of some of this discomfort and seek to give a voice to some of the broader conceptualizations of language that we have encountered in our work.

We begin this chapter by exploring alternative frameworks for understanding language as social practice that allow us to situate our linguistic practice within the broader cultural context. In Section 3, we describe the historical process of naming local languages in Milne Bay Province, Papua New Guinea, as a case study, exploring how linguistics has related to individual languages from this region. Section 4 explores selected topics that are important to communities when they talk about language. Engagement with these topics supports meaningful collaboration between communities and linguists. In Section 5, we argue that developing an awareness of a wider range of perspectives on language will facilitate a deeper understanding of language as it is experienced by speakers.

2.   Viewing language through experiences and assumptions

Even a cursory observation of beliefs about language and its nature in the world around us clearly illustrates that each person's individual understanding of the nature of language is influenced by their personal experiences. The field of folk linguistics has explored 'lay' views of language as a source of alternative understandings of language and languages (for example, Niedzielski & Preston, 2000). Views of language create assumptions that frame how people see the world and the language(s) around them. Introductory linguistics courses spend considerable effort in teaching students to look at language *objectively*, challenging their assumptions about language and expanding their experiences of language. Linguists' training and professional practice contribute to the experiences of *languages* that are available, and the assumptions about what counts as relevant. This in turn restricts the set of phenomena that linguists include in linguistic analysis. Likewise, speakers of languages that linguists work with each have their own set of experiences and assumptions that create their understanding and use of language. These experiences, beliefs and assumptions form frameworks that are co-created by individuals and the communities they belong to through shared cultural membership, whether that is a community of linguists or a language community speaking an endangered language.

These experiences, assumptions and beliefs are core to linguists' very understanding of what language is and what counts as language practice. The question underlying the chapters in this book represents one such a framework. In

linguistics we consider linguistic structures as entities that exist within a social and historical context with a relationship that is open for debate. That is, the linguistic structures are central (Figure 1).
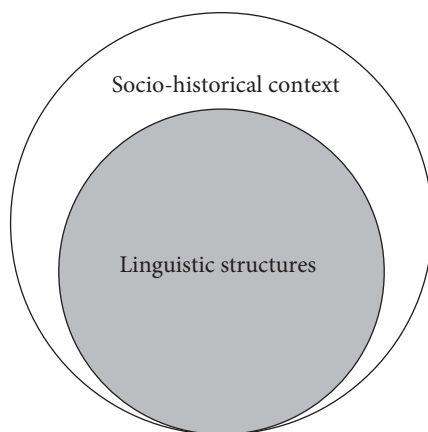
Figure 1. Relationship of socio-historical context to linguistic structures

The relationship between experiences, assumptions and beliefs, and linguists' understanding of what language is, can be seen in the structure of language grammars. These grammars typically provide some social and cultural description at the start, before going on to describe the structure of the language. This relationship is also evident in the approach of much descriptive linguistic research practice. As linguists, we approach a community with the plan of learning about, and collecting data about linguistic structures, while accepting cultural knowledge as helping us understand the linguistic data more fully.

When we reflect on our interactions with people in Papua New Guinea, this model does not fit well. The central focus on structure and peripheral interest in the social and cultural context produced conflict with consultants who had quite different ideas about what constituted knowledge about language. In our experience, linguistic data was not shared without first sharing cultural experience. Conversations about language focussed on the history of missionization, colonization, clan relationships, migrations of people, current social unrest, location of mountains, waterfalls, rivers and stars. Narratives were shared alongside walks through the bush to see the corresponding features of the landscape to provide us with *proof* of their truth. Stories of current conflicts and disagreements were shared, providing explanation of reluctance to share linguistic data. Language was central, but it was central because of its iconicity. The language structure was not *influenced* by social cultural factors, but was an identity-creating expression of them. The point was the environment, and the language was the reflection of this (see Figure 2).
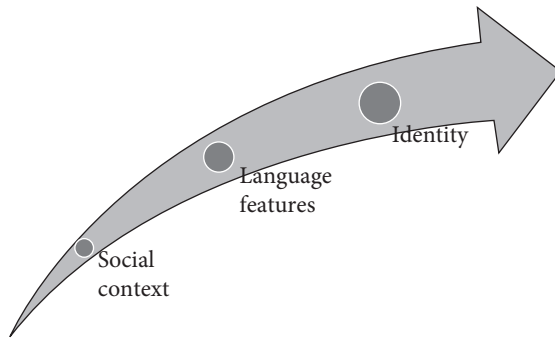
Figure 2. Social context and language contribute to identity

The following section explores these two frameworks of *languages* as they are evident in the process of the creation of language boundaries by linguists and members of the speech communities themselves.

3. Creating language boundaries

Language boundaries and the classification of a speech variety as a *language* (or not) is highly contested linguistically and politically across the globe. This is an issue of significant practical importance for speakers of many small language varieties, especially in the context of social marginalization and language endangerment, since recognition of a variety as a *language* facilitates access to various kinds of intellectual, and sometimes political, support that is likely to be far less readily available to a dialect. Practical outworkings of this can be seen in the creation of 'official languages' and 'national languages', and the resources provided for these varieties.

The act of language classification is primarily an act of creating boundaries between groups of people, in this case based on linguistic difference. Thus, the task by its very nature is situated in a framework of *othering*. While linguistics has sought to bring objective, scientific processes to this task, awareness of the emblematic nature of particular linguistic features is often evident among speakers. In this section we focus on a study by Easton (2007) which provides an account of the creation of language boundaries in a small area of Papua New Guinea on the southern coast of Goodenough Bay, Milne Bay Province (see Map 1). This study highlights the frameworks, or *discourses*, that have influenced the creation and naming of *languages* and *dialects* in this region. Firstly, the creation of *languages* in the region within the field of linguistics is considered. Secondly, the creation of *languages* is considered from the perspective of the speakers themselves. After presenting these

two perspectives, the role of *erasure*, *iconization* and *fractal recursivity* (Irvine & Gal, 2000) is explored in the process of creation of language boundaries.
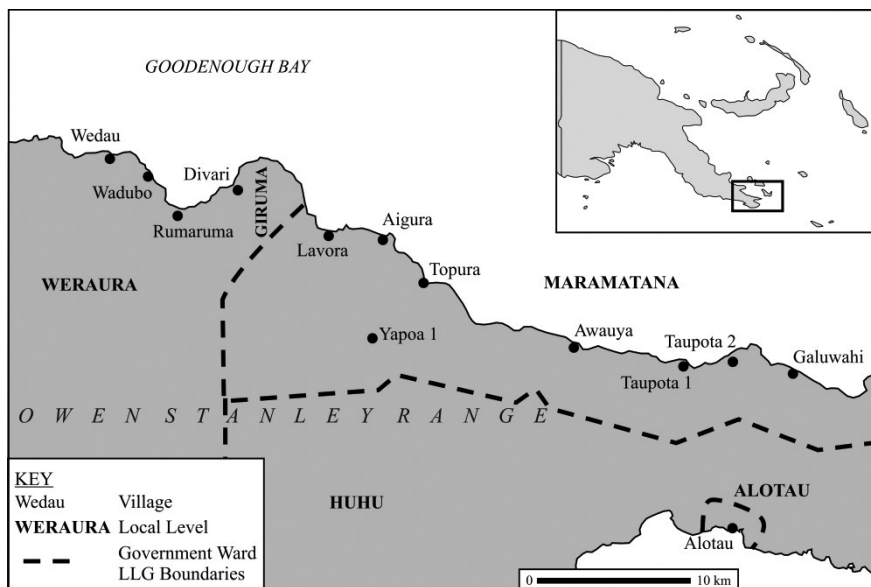
Map 1. Wedau to Galuwahi, Milne Bay Province, Papua New Guinea

3.1   Linguistic creation of languages

The linguistic diversity of Papua New Guinea is well recognized among linguists. With the arrival of European colonization in the late 1800s, the task of classifying the speech varieties of Papua New Guinea into *languages* and *language families* caught the interest of a wide range of people, from patrol officers to missionaries, teachers to linguists. In fact, the obvious linguistic diversity of the region ignited an interest in the study of languages among some who had originally arrived in Papua New Guinea to teach or work as missionaries (e.g. Ross, 1988; Clarke, 1977; King, 1901). In the mid 1970s a multivolume work classifying the languages of Papua and New Guinea was published by Pacific Linguistics (Wurm, 1975, 1976, 1977). Due to the enormity of the task of language classification, data from a variety of sources was readily shared and used by linguists and others interested in language. The methodology sections of these volumes discuss the diverse sources of data used, and the paucity of data from many language areas (see also Lithgow, 1976; Wurm & McElhanon, 1975). While these studies often describe their methodology in detail, and the difficulty of classification of *languages* and *dialects* was acknowledged (e.g. Wurm & Laycock, 1961), the socio-historical and historical

factors that underpinned the placement of language *centres* and *boundaries* were nonetheless influential in the classification.

In this case study we focus on the historical and socio-historical factors that have shaped the classification of speech varieties along the southern coast of Goodenough Bay, Milne Bay Province, Papua New Guinea. During the early days of contact with outsiders in the 1890s, geography functioned as a powerful filter that had a profound influence on the identification of languages:

> *Languages* were discovered and named when missionaries, government officials and plantation owners came into contact with the people living near deep harbours and land considered suitable for plantations, mission stations and government stations. (Easton, 2007, p. 86)

The rugged coast line of Milne Bay and Goodenough Bay, separated by the tail of the sharply rising Owen Stanley Range, determined where Europeans landed and consequently what speech varieties they came into contact with. As missionaries travelled along the southern coast of Goodenough Bay, they stopped between Galuwahi and Taupota. Taupota was home to a man who had come into contact with the church's teaching while working on the plantations of Queensland. After an initially welcoming reception, the missionaries were quickly pushed on further by illness and harboured below Dogura Plateau in Wedau. In this process, they had come into contact with their first two *languages*: Taupota and Wedau. Grammars and dictionaries were produced for both varieties (Easton, 2007, p. 87).

The establishment of mission stations consolidated the status of certain speech varieties into languages. Their territories and their spheres of influence expanded far beyond their traditional language areas (see also Mühlhäusler, 1996). *Mission languages* became the language of institutions such as churches, schools, health clinics and other administrative bodies. Ultimately only Wedau, as the speech variety of the major mission station, succeeded in achieving the status of a mission lingua franca and only the grammar and dictionary of Wedau were ever published (King 1901; King 1950; Jennings 1956). Hymn books, religious materials and other educational materials (e.g. Jennings 1930) followed as the Wedau lingua franca became the language of Christianity and education well beyond the original bounds of the speech variety. One of the effects of this was to de-rank the variety spoken in Taupota (as well as many other speech varieties) and obstruct its development into a written language (Easton, 2007, pp. 89–90).

The speech varieties along the southern coast of Goodenough Bay are classified linguistically as belonging to the Taupota Chain of the Nuclear Papuan Tip Linkage, part of the Western Oceanic Linkage of Austronesian languages (Lynch, Ross, & Crowley, 2002). As shown in Map 2, this classification does not include actual boundaries between *languages*, and the number of *languages* in the Taupota chain

varies due to differences in methodology (Ross, 1988, lists five, Gordon, 2005, lists nine). However, the division of the villages from Wedau to Taupota into two main language groups, Wedau and Taupota, has persisted from early mission encounters into the current descriptions of linguists (see Easton, 2007, pp. 90–100), despite a recognition of the chain-like nature of the speech varieties of the area.
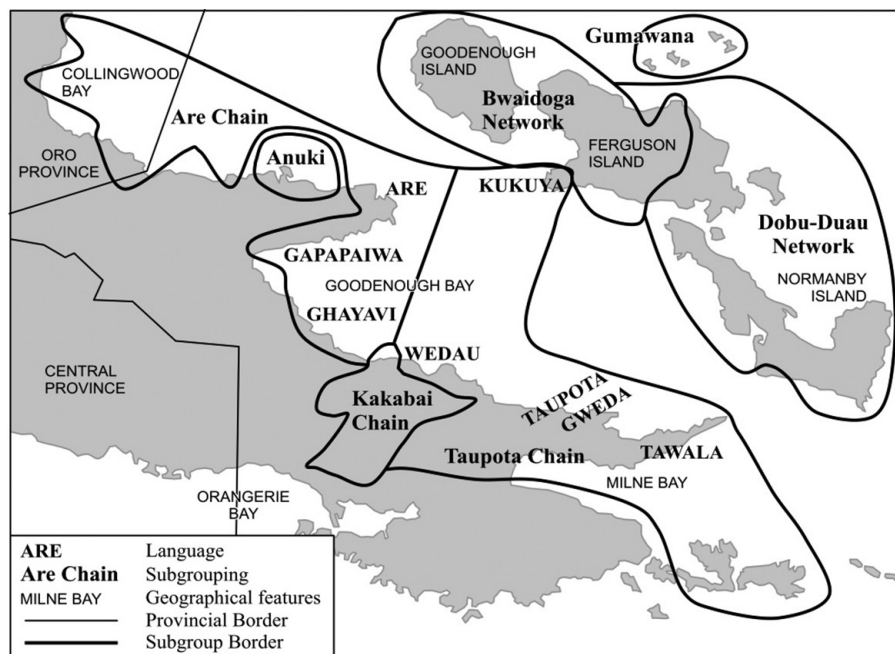
Map 2. North Mainland/D'Entrecasteaux linkage showing languages of the Are-Taupota chain (based on Ross, 1988, and Lynch et al., 2002)

The distinction between the speech varieties of Wedau and Taupota has continued for over a century and is found in the work of Ray (1907, 1938), Capell (1943, 1954, 1962, 1969), Lithgow (1976), Ross (1988), and Lynch et al. (2002). Their classifications were based on an underlying assumption of the centrality of Wedau with justification based on lexical and grammatical similarity and differences (Capell, 1954; Lithgow, 1976), systematicity of phonological patterns (Ross, 1988), and typological features (Lynch et al., 2002). Thus the tools of linguistic analysis were used within an assumption of Wedau being linked to Taupota via a dialect chain, and further consolidated the distinction between Wedau and Taupota. This division became part of the socio-historical context that framed how the *languages* were viewed.

While Lithgow (1976) acknowledged the role of *central* dialects in influencing classification, and Ross (1988, p. 8) acknowledged the chain-like nature of the speech varieties of the region as problematic for the identification of *languages*, the data used and the foundations of linguistic knowledge in the region provided a strong socio-historical context that permeates the classifications. If the mission had been established at Topura, between Taupota and Wedau, the speech varieties of both Wedau and Taupota may have been classified as varieties/dialects of the Topura language. The similarities between varieties and the existence of the dialect chain, and the linguistic analyses used above could have likewise been used to support the classification of Topura as *central*. While working in the region, Easton met a man from a village further west from Wedau with a speech variety that is not represented at all in the linguistic data from the last 120 years. The classification of these languages may well have been different if that village had the best harbour and the missionaries had stopped there.

Ross (1997) discusses the need for linguistics to consider not only current linguistic features, but also the role of social networks, as constructed by individuals within their cultural context, in linguistic innovation and therefore language classification. In this, he acknowledges the dynamic social nature of speech varieties, which change internally in their structure and in their relationship to other speech varieties through the connections and networks that exist between speakers. Reflecting on her work in Papua New Guinea, Romaine (1994, p. 12) has suggested that the "very concept of discrete languages is probably a European cultural artefact fostered by procedures such as literacy and standardization." Similar views can be found in Irvine & Gal (2000), Milroy (2001) and Woolard (1998, p. 20). However, the assumption that *languages* exist and should/can be classified and described strongly underpins the work of linguists. At the most basic level, when linguists produce a grammar or a dictionary of a language, they assume its existence as an entity. When linguists engage in language planning or language documentation activities, they tend to engage with these activities for a particular *language*. For many field linguists, the experience of engaging with speakers of other *languages* reflects Romaine's findings and challenges even this very basic assumption of linguistics.

3.2 Community creation of languages

As discussed above, the act of classification of speech varieties is an act of creating boundaries between groups of people. Thus, for speakers, the task occurs within a discourse of *self* and *other*. In discussing speech varieties, particular linguistic features become emblematic of both self and of other. Easton (2007) contrasts

the linguistic classification of the speech varieties from Taupota to Wedau with the ethnoclassification of the communities concerned using methods of perceptual dialectology (Long & Preston, 2002). Unlike social dialectology, which seeks objective data about language difference that correlates with social difference, perceptual dialectlogy seeks to explore speakers' perceptions of their speech and others', as well as their attitudes towards this. Easton (2007, pp. 208–219) invited representatives from each of the villages in the region between Wedau village to the west and Galuwahi to the east to engage in conversation about the speech varieties in the area. The conversation was guided by questions such as 'Who speaks like you?' and 'Who speaks differently?' A map of the region was used to facilitate this discussion, and results were drawn onto the map to create a pictorial representation of the data and altered as the discussion continued. Three findings are relevant to this discussion. Firstly, ethnoclassification was not based on the same set of features as linguistic classification; secondly, the ethnoclassifications varied between villages and differed from the linguistic classification; and thirdly, language was considered to be a salient feature in and of itself, but was never presented as being separate from social, cultural and historical contexts.

When people described the distinctiveness of their speech varieties, the typical starting point was the sound system. In ways that seem to reflect comparative linguistics (Ross, 1988), discussion focussed on the differences in the realization of phonemes, especially the phonetic variation of the coronal approximate [l]~[j]~[ð], and added or lost phonemes, particularly the glottal phonemes [ʔ] and [h]. For example, Easton (2007, p. 214) reported that in Topura people talked about their village traditionally being an 'h' speaking village, as opposed to the villages to the west where 'h' was gone. Thus, 'h' became emblematic of linguistic and cultural change that had resulted in the younger generation using the 'h-less' Wedau speech variety. However, the most salient feature across the survey was the *tune* (intonation patterns) of the variety. Easton (2007) found that imitation of the *tune* of other villages was common in conversations about linguistic diversity, as was the explanation that the *tune* is a remnant of older, now dead languages. There is no record of these languages in the linguistic literature but Easton also heard reports of *old* languages in remote areas in the mountains. While a small number of lexical differences were mentioned, these were not the focus of the discussions. The discussions of sounds and *tune* connected people with speech varieties that were more diverse before missionization and colonization. The loss of some of these features in some villages was emblematic of their loss of culture and traditional identity. Language and language difference was a mirror for social and cultural change.

The data obtained through ethnoclassification is difficult to represent in a single map of the area. The results are not uniform, but rather reflect the social, political

and historical relationships in the area. There was a distinction between the perspectives that combined speech varieties from Wedau to Taupota into one group (which contains a set of more localized groups), and those which split Wedau and Taupota into two groups, with the place of the dividing line varying from between Divari and Lavora, to between Awauya and Taupota. Map 3 shows the results from Wamira, where the historical position of Wamira, not Wedau, as the original village and people of the area is evident in the language names. Further, the existence of a single 'language group' that extends from Taupota to Wedau reflects their understanding of the relationship between Wamira and varieties to the east.
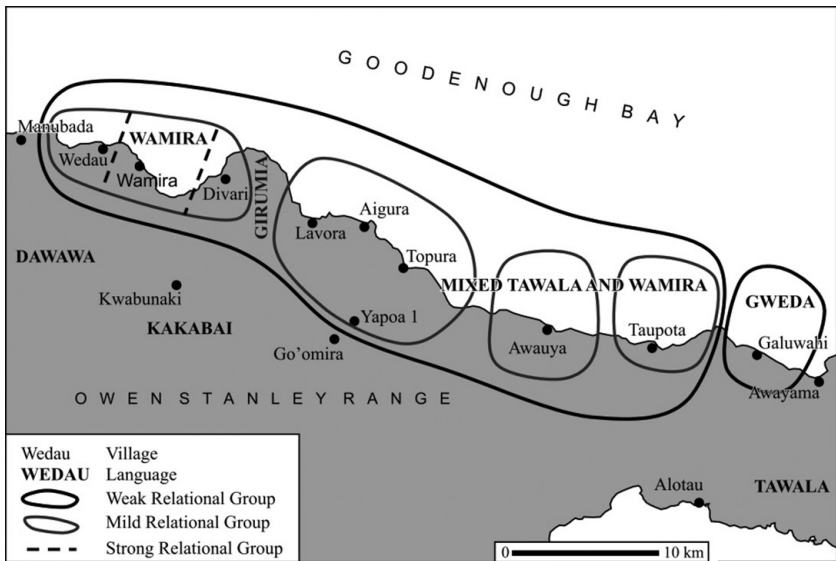
Map 3. Ethnoclassification of Wamira

This stands in contrast to the map from Divari (Map 4). Divari is located only a few kilometres along the coast from Wamira, and was originally a garden settlement for people from Wamira. In Divari, the area was described as having two main languages: Wedau and Taupota, reflecting the linguistic classification described above. Interestingly, while the major groupings in these maps differ from those described in Wamira, the more local groups remain the same.

Map 5, from Taupota, also demonstrates a clear distinction between Taupota and Wedau speech varieties. Unlike the previous two maps, it shows local awareness of differences in the speech varieties between Taupota 1 and Taupota 2. The maps from Divari and Taupota also illustrate the linguistic diversity of Galuwahi, where the traditional speech variety, Gweda, was moribund before it was more recently introduced as the language of instruction for the Elementary School.
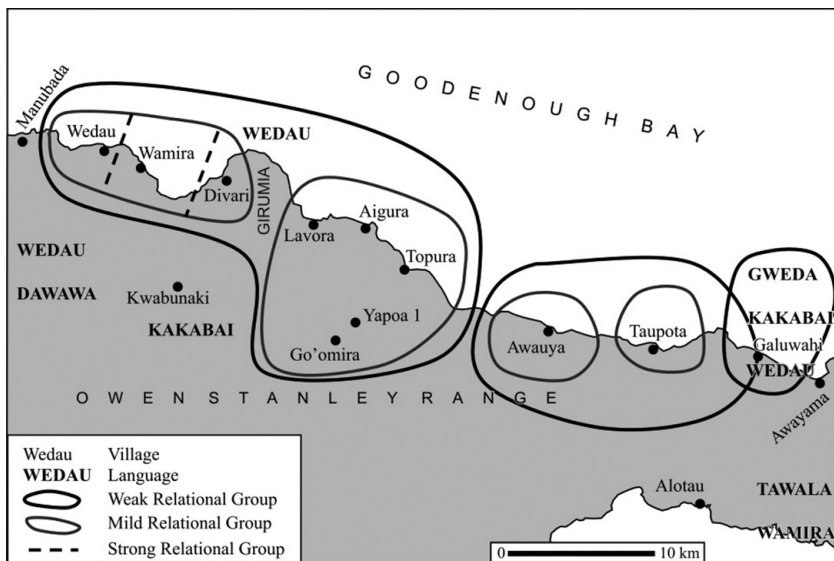
Map 4. Ethnoclassification of Divari
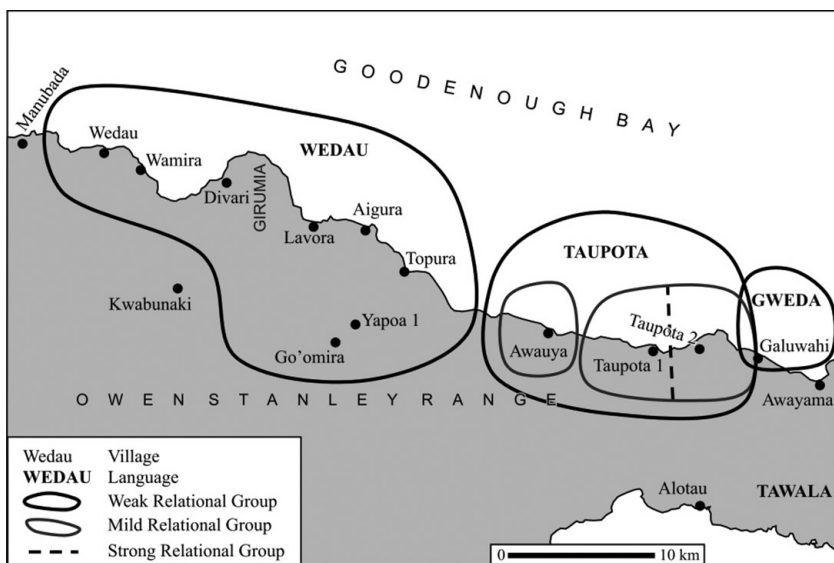
Map 5. Ethnoclassification of Taupota

In each village the mapping task occurred within the context of a shared meal and sharing of life stories. On a number of occasions, participants expressed their appreciation for the fact that there was room for them to relate the stories of their past as these have led to the current social, cultural and linguistic situation. The

role of place, social networks, and history on the current language situation was acknowledged through the way completing the mapping task was conducted as a social event. The features discussed in relation to these maps were iconic of who the participants were and illustrate how they understand their relationship with those in surrounding villages. The features discussed were emblematic, reflecting an underlying story and collective truth. An attempt to create a summary map would require some voices to be silenced.

Ethnoclassification provides an insight not only into the way speech varieties are classified by people in a particular area, but also into how those who do the speaking are classified by others, and how the places where the speaking is done are classified. The classification of speech varieties is a powerful expression of how speakers group themselves and those around them. They do this with reference not only to linguistic features, but also, more fundamentally, to the cultural, historical and social boundaries constructed within the particular socio-historical context.

3.3   Processes in the creation of languages

In the process of the creation of languages, linguists and speech communities work to draw distinctions between groups using salient linguistic features to reflect the socio-historical context as they experience it. Irvine & Gal (2000) identify three important semiotic processes that communities, individuals and linguists use in constructing their own and other communities' speech varieties as emblematic of particular social groupings. They use these processes to establish languages as distinct entities in association with specific communities. These three processes are:

–   Iconization:
    [T]he attribution of cause and immediate necessity to a connection … that may be only historical, contingent, or conventional (Irvine & Gal, 2000, p. 37)
–   Erasure:
    Facts that are inconsistent with the ideological scheme either go unnoticed or get explained away (Irvine & Gal, 2000, p. 38)
–   Fractal recursion:
    [T]he projection of an opposition, salient at some level of relationship, onto some other level (Irvine & Gal, 2000, p. 38).

Iconization can be seen in the creation of boundaries between language groups by speakers. Iconization is the process whereby language reflects the creation of identity based on the social context. For example, in all the villages from Wedau to Taupota, a boundary was drawn between Taupota and Tawala to the east. Orthography choices reflect this distinction.

A village leader from Taupota stated that while the older people initially did not want to differentiate between the voiced velar fricative and plosive due to the influence of Wedau, the need for differentiation was actually a matter of linguistic identity. The neighbouring language, Tawala, does not have the voiced velar fricative, but has a number of cognate words which use a voiced velar plosive. Consequently, underdifferentiation of the plosive and fricative would result in failing to represent one of the indexical differences between Taupota and Tawala. The village leader commented, "If we write ⟨g⟩ we will be writing Tawala but speaking Taupota". The orthography for Taupota represents the voice velar fricative with the digraph ⟨gh⟩. A salient example used in community discussions is given in Table 1.

Table 1. Comparison of Tawala and Taupota phonemes

	Taupota	Tawala
'stone'	/ɣaima/ ⟨ghaima⟩	/gaima/ ⟨gaima⟩

Interestingly, the Taupota decision to draw a distinction between themselves and Tawala has resulted in making a distinction from Wedau, speakers of which have the same phonetic realization of this phoneme but use either ⟨g⟩ or ⟨ḡ⟩.

Iconization is also evident in work by linguists when different methods of language classification focus on particular features of language and draw boundaries based on these findings, whether the focus is on lexical differences, phonological differences or other features. In each case differences between them become iconic of languages.

Whereas iconization establishes difference, erasure removes awareness or representation of both difference and similarity. Easton demonstrates this process by looking at the orthographic choices made by the Wedau and Wamira communities, who chose the same orthographic symbol to represent phonetically distinct (though phonemically equivalent) sounds, apparently to reinforce their shared identity (Easton, 2007, pp. 244–245).

As can be seen from the maps from Wamira and Divari, discussed above, while there are differences in the speech between these villages, there is also a shared sense of identity. For Wamira this shared identity comes from their status as the descendants of the original occupants of the area. They refer to the language as Wamira, not Wedau, and consider that they were the original speakers and are the present day owners of Wamira/Wedau. They report that the ancestors of the occupants of Wedau village adopted their language when they settled in the area.

Table 2. Variation of coronal approximant

	Orthography	Wedau	Wamira	Divari
Word initial	*lam* 'food'	[ðam]	[lam]	[lam]
Intervocalic	*ola* 'hill'	[ɔða]	[ɔla]	[ɔla]

To find and objectively describe linguistically motivated language boundaries, linguistic methodologies have led to a process of erasure. As discussed above, from the early days of the missions, Taupota and Wedau were identified as different languages. Their prominence in the literature has come at the expense of recognition of the distinctiveness of the other speech varieties in the area. As a result Taupota and Wedau gained institutional status while the other varieties were marginalized and ignored. This story is told by speakers of these intermediate varieties as a process of loss of identity, language and culture.

The final process we discuss here is fractal recursion. Cultural oppositions based on land or history can be reflected recursively in the creation of the *other* as they are reflected onto language. Differences in the realization of phonemes become the salient expression of otherness which extends from a much deeper difference: *imagined others* are created.

Our next example shows how salient linguistic differences become objects creating cultural and social boundaries when changes in language forms are equated with change in language identity. This is evident in the use of phonetic variation of the glottal phonemes as the marker of membership to a group. This process is happening across the area and is most complete in Wedau. Glottals were already absent in the language at the time of missionization. In other varieties the process is underway. Table 3 shows the distribution of the glottal phonemes in Lavora, Aigura and Yapoa.

Table 3. Phonological assimilation of glottal phonemes /ʔ/, /h/

	Lavora	Aigura		Yapoa 1
		<35	>50	
'good one'	[aiaina]	[aiaina]	[ahiʔahina]	[ahiʔahina]

The shift is just beginning in Topura, where the older generation are saddened by the younger generation's deletion of [ʔ] and [h], making them now Wedau speakers.

As a result of linguistics having created the two central *languages* of Wedau and Taupota, other language development work in the area, in education and

language standardization through the task of orthography development, was expected to consolidate around these two varieties. In other words the boundaries drawn through language classification were projected outwards onto intermediate varieties and onto language products developed for them. The strength of this semiotic process is evident in the fact that this classification, which seems like a rational outcome to outsiders, was resisted and resented by the intermediate communities themselves.

4.   What might linguistics be missing?

Having explored the ways in which the socio-historical context of participants in linguistics-related activities (from mission settlement to historical reconstruction, and from grammar writing to *storying* with village leaders) impacts on the ways in which languages are identified and studied, we now consider those aspects of language that are typically prominent in the minds of speakers but absent from the descriptions linguists produce. Nakata (2007), in a review of studies of Torres Strait Islanders by outside experts, and with particular reference to research by Ray (1907), sums up the frustrations of many of the people we have worked with when he observes that:

> It is their speech, not their meanings, that is seen as the important part of the act of speaking. They are heard but not listened to; how the words are spoken is more important than what is being said.   (Nakata, 2007, p. 37)

The rise of structuralism in linguistics led to the exclusion of context and meaning from linguistic analysis and filtered out cultural knowledge from the process of language description. Although this dramatically developed linguists' ability to understand the structures of language, it shifted their focus away from other important aspects of language. Irvine and Gal observe that:

> In constituting itself as an academic discipline, linguistics rejected precisely this culturally embedded [folk theoretical] speaker's perspective. It insisted instead on de-culturing linguistic phenomena and establishing the theoretical and thus disciplinary autonomy of language […] signs are indeed *arbitrary* because the cultural systems that make them iconic are stringently and systematically excluded from consideration.   (Irvine & Gal, 2000, p. 78)

Consultants and other community members who are interested in linguistic research often go to great lengths to provide researchers with ways into understanding meaning in their community. Sometimes this is framed as *knowing about the culture*. This knowledge also refers to a set of experiences and concepts that together mediate relationships with outsiders. The position of linguistics must be

mediated in relation to the community. And consequently the creation of linguistic knowledge about the community's languages must also be mediated. However, if these areas of community knowledge in relation to language are not identified as contextually significant, the relationship between different ways of knowing about language is fractured. As a result, central concepts for deep understandings of the language in context may be read as distractions and irrelevancies within the discipline.

One single approach is unlikely to meet all the requirements of documentation and the aspirations of the community with regard to their language, and linguists cannot become experts in all possible approaches. A more manageable response is to be mindful of the various limitations of each of the approaches the discipline offers in relation to language. In this section we explore relationships between context and community worldviews that relate to language in ways that challenge the disciplinary boundaries of linguistics. We begin by considering the ways that language relates to place – both because different ways of speaking are related with different areas and groups of people and because particular stories, shared in language, are associated with particular places.

We then turn to the relationship between language and spirituality. Language is an important way to express spirituality and also to encode its meanings in particular traditions. This is important if experience of spiritual matters is to be shared and if relevant knowledge is to be passed on to others. Language and spirituality together have much to offer communities in connection to healing from past injustices and addressing the injustices of the present. Hinton (2002, p. 152) lists spirituality as a central theme in writings of North American Native people on the importance of language. In fact all four themes she discusses, language as healing, language as key to identity, language as key to spirituality, language as carrier of culture and worldview, revolve around the spiritual and social health of the individual, their community and culture. While many linguists readily acknowledge the importance of language to wellbeing in minority communities, these are nevertheless difficult ideas to articulate and respond to within the bounds of the discipline.

4.1   Language and place

A common feature of storytelling in Papua New Guinea is that the narrator expends a good deal of effort in establishing the location of the story in the mind of the listener. This may involve a visit to the location as part of the process of telling the story, or it may involve an extended description of a particular feature of the landscape and where it is to be found. Sometimes this

information is established before the story begins, while with others it may form part of the story itself.

The following reference to place closes a story about a man who meets with supernatural beings while out fishing. The story is by Mali elder Henry Methamon (Stebbins, 2009, pp. 131–134). These closing lines strengthen the veracity of the story by asserting continuity in relation to features of the natural world as they appear in a particular location.

(1)   *Dē chinak kēvicha ma morka chēvak ma cha tet tēcha renggi.*
       And that particular ancestor who went along the river.

       Dē cha met dē vus.sēcha ve, vēk kē kethopka chēvak ma tha tes ka ia Ulachēm, vono sēng angēmēng.
       And he went and emerged there at that pool, that one they call Ulachem, up among the trees.

       Da mamēr ia ngia thet dē ngi snan dē mamēr ia thi chura nge nēchama chethopka chēvap.
       It's good to go and ask if it's possible that they show you that pool…

       Dē chok kave chēlan nas, ma asik klan ia ichum, da sik klan ia chama angēmēng ngē don mano, dak vuves.sē ngēt ma vono sēng angēmēng ma vono.
       It's still the same, when it floods, and if [it's] like this that trees go down into the river [further up], but they arrive out up among the trees up there [in the pool].

       Chok ka ve chlan nas ma chēlan ia ichum, dē chok vuvuik nē chama angēmēng.
       It's just like that, when it floods and the trees arrive up [in the pool].

       Dasika vandi ngia thet diva ngi lu da chok mamēr ia ngi lu.
       And if you want to go in order to see, you can just see [it].

       Da avivui viavik dē munggurup ma Varongo chinēma Menima.
       Up that way, in the middle [of] Warangoi and Menima.

       Mēni chama isia ma sai chok kēvingait ma tha tes ngait ia Ulachēm mēni ngait avēchit mui.
       On the ridge, just that one that they call Ulachem, on that one over there.
       (Methamon in Stebbins, 2009, pp. 131–134)

In these Papua New Guinean contexts, stories and the language that carries them are anchored in particular places, describe the formation of places, are validated by their connection to place, and are contextualized in a wider cosmology of other stories with reference to place.

Words and place are also central to the Tolowa understanding of language described by Collins (1992, p. 409):

> [W]ords are indexes of stories and situations, they are embedded within and associated with the art of remembering, a remembering interested in desire and sexual malfeasance,[2] and a remembering concerned with a relationship to land. For that knowing of names for places – 'every riffle in the creek' – is tied up with knowing what occurred at those places, why they are called by that name. It is a geography that is also a history.   (Collins, 1992, p. 409)

The discussion in Section 3 described how language also indexes locations and the communities settled within them. In the examples there, sounds and intonation patterns tended to be the focus of associations between language and place. In other communities words and structures may have more prominence. For example, in many parts of Australia language names are related to the words for meanings such as 'what' or 'no'. The Wemba Wemba and Yorta Yorta languages are named just in this way, with words for 'no' having the forms *wemba* and *yorta* respectively.

4.2   Language and spirituality

The relationship between language and country is a deeply significant one in Aboriginal cultures across Australia and connects to our final theme, spirituality. Sutton (1991, p. 50) describes how this relationship is primarily between land and language and how, through spiritual associations with land, language is then related to people.

> Tindale's (1974) 'tribal' map […] is still often misinterpreted as a map of the distribution of speakers of particular languages at some point in the past. It is more accurately seen as a religious statement. What it marks are the lands whose owners under Aboriginal customary law were given particular languages during the mythic foundation of the world, the Dreaming, and it plots those land/language associations.   (Sutton, 1991, p. 50)

Languages not only represent spiritual relationships but also mediate them. In his discussion of the translation problems that arise in shifting between oral Mohawk traditions and written English translations of these texts, Jocks (1998, pp. 218–219) refers to a situation in which the head singer in charge of a coming-of-age ceremony is frustrated by his inability to use English for communicating fundamental information about the implications of the ceremony to participants. Jocks asks how meaningful relationships with the spiritual world can be maintained in the

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2.   This refers to a particular example Collins mentions on the previous page of his work and should not be read as intending to make general statement about the community or the language.

face of language loss given that "[a]ccording to many Native North American elders, such relationships are only fully maintained through ceremonial work in traditional languages" (Jocks, 1998, p. 219).

This is not to suggest that linguistics should necessarily make the spiritual life of the language community into the centrepiece of its research. Whereas academia values the open availability of knowledge, language communities may have other perspectives. For instance, in many communities the access to certain areas of knowledge is restricted in various ways. Exploring the particularities of words as a way of learning about language is likely to involve encounters with the unknowable (cf. Stebbins & Planigale, 2010), and it will be necessary for linguists to find ways of clarifying exactly where the boundaries sit.

Stebbins' experience with the Mali community in Papua New Guinea (Stebbins & Planigale, 2010), for example, clearly shows that a community may be deeply committed to maintaining boundaries around ceremonial knowledge that exclude the researcher. Indeed, successful research in many communities depends on the linguist's ability to establish appropriate boundaries for enquiry. Respecting these boundaries of the knowledge economy within a community is quite different from failing to recognize that these areas of knowledge exist. Linguists need to be mindful that communities are more concerned with context and meaning than with the forms of language per se.

How can linguists understand the significance of spirituality to language? Jocks (1998, p. 230) argues that while a colonizing language may be used to attempt to fill the conceptual vacuum created by the loss of indigenous languages, the replacement can never be complete. The refashioning of traditional life this entails is certainly not something over which linguists can have authority. However, linguists can and do recognize this deeper significance of language, the ways in which it resonates in the communities in which they work, and give these concerns space in discussions with the community.

This aspect of community life can be an explicit part of linguistic fieldwork. For example, Vicki Couzens, a Keerray Woorroong Gunditjmara woman working on language revival in her family and community, describes the process of expanding the lexicon of the language, spoken in South Western Victoria (Australia), as a process of *dreaming* "to ensure that the choice and development resonate with my intuitive or spirit sense of what is appropriate to the language as an expression of country" (Couzens *pers. comm.*). Dreaming in this context refers to an active and creative process that takes long and deep reflection and incorporates whatever active knowledge is available to her from past learning.

More challenging still from a disciplinary perspective is the practice Couzens shares with a few other language revival workers in Australia of calling out new or revived words on country as a way of testing them to see if they feel

right. Although it is easy to see how this makes sense in the context of a connection between language, spirit and the land, from a disciplinary perspective, where words make sense either diachronically, with reference to other words related by form, or synchronically, in relation to words in lexical networks and paradigms, there is nowhere for this sensibility of sound shape, meaning and experience to go.

There are other ways of speaking with the world. People in Milne Bay talk about going out to catch fish and calling out their names. When the fish hear their names, they come to be caught. In this example, language is used for purposes that are both spiritual and practical. The connection between spirituality and everyday life is so deep that focussing on language without awareness of its connection to spirituality hides many purposes and practices from view.

These aspects of language are deeply important to speakers of many languages. As linguists working in community settings, we regularly encounter them. Even as they are difficult to place in relation to the discipline, they are central to the relationships linguists need to build with speakers if the work they do is to have positive outcomes for the communities who host them.

5.　What could linguistics do with this information?

We have argued that language is shaped by the socio-historical context of research, including the identities, theories and practices of linguists who work with speakers and communities. Particularly working as we do in the context of minority languages, we are concerned about the impact that our work has, not only on the shaping of languages as they are recorded for posterity but also on the communities with whom we work. As we noted in the introduction to this chapter, there are risks as well as benefits in seeking rapprochement between the different perspectives that linguists and speakers bring to the table in the joint work of language description, documentation, revival and revitalization.

In this section we consider how linguistics can be more responsive to the diverse perspectives on language that linguists find in joint work and ask how these different approaches can be accommodated in the larger project of sharing knowledge about language. There are three main strands to this discussion. We begin by exploring theoretical frameworks that can accommodate the diversity of views on language that we have encountered (Section 5.1). We also explore how linguistics as a practice can be framed in a wider set of intentions around cultural safety (Section 5.2). Finally, we review the types of products that have emerged from joint work to date and consider future directions for the discipline (Section 5.3).

5.1   Multiple perspectives on language

Although this chapter is mainly concerned with non-scientific perspectives on language, as we have already acknowledged, structural linguistics has provided many powerful tools for understanding language. It is not our intention to diminish the value or significance of these tools. Rather, we seek to broaden the scope of what is possible within the discipline so that these tools can exist and be used alongside a rich and varied set of resources that come from other ways of knowing about and understanding language.

Folk linguistics is one strand of work within the discipline that has been exploring others' perspectives on various aspects of language. This approach was used in Section 3.2 to document speakers' understandings of language variation. Niedzielski & Preston (2000, p. 5) identify a specific conceptual hurdle that linguists need to overcome in order to engage with other perspectives in any meaningful way. They note that empirical methods impose constraints that other knowledge traditions do not adhere to. In their discussion of objections to the study of folk linguistics, that is, the knowledge about language held outside of the discipline, they contrast the following two approaches:

> One of the styles of characterizing data demanded and admired by science is a consistent point of view; no such stringent demand is made on the folk. Such shifts, however, make folk taxonomies elaborate and overlapping, and the elicitation, characterization, and interpretation of folk belief is made both more complex and more rewarding as a result.   (Niedzielski & Preston, 2000, p. 5)

If linguists are to engage fully with other traditions of knowledge, they need to find ways to hold the different, often shifting perspectives of non-disciplinary knowledge traditions and communities *at the same time as* they contribute their own methods and techniques of knowing and finding out about language. Given that positivist frameworks generally struggle with the concept of more than one right answer (with some obvious exceptions such as the particle and wave theories of light in physics), we begin by exploring the writing of Gadamer because he provides a way for linguists to acknowledge that there are different ways of seeing and understanding the world and that they can know about the perspectives of others.

Gadamer (2013) is concerned with the cost of adhering too closely to a single method. In order to explain our capacity for understanding each other, Gadamer describes people as operating within contexts of meaning, or horizons:

> Every finite present has its limitations. We define the concept of 'situation' by saying that it represents a standpoint that limits the possibility of vision. Hence essential to the concept of situation is the concept of '*horizon*.' The horizon is the range of vision that includes everything that can be seen from a particular vantage point [...] A person who has no horizon is a man who does not see far

> enough and hence overvalues what is nearest to him. On the other hand, 'to have a horizon' means not being limited to what is nearby but being able to see beyond it […] working out of the hermeneutical situation means the achievement of the right horizon of inquiry for the questions evoked by the encounter with tradition.
>
> (Gadamer, 2013, p. 301–2)

Speaking with reference to understanding across different times, Gadamer argues that people can see things from others' perspectives:

> In the sphere of historical understanding, too, we speak of horizons, especially when referring to the claim of historical consciousness to see the past in its own terms, not in terms of our contemporary criteria and prejudices but within its own historical horizon. The task of historical understanding also involves acquiring an appropriate historical horizon, so that what we are trying to understand can be seen in its true dimensions. If we fail to transpose ourselves into the historical horizon from which the traditionary text speaks, we will misunderstand the significance of what it has to say to us. To that extent this seems a legitimate hermeneutical requirement: we must place ourselves in the other situation in order to understand it. (Gadamer, 2013, p. 302)

In other words, by exerting ourselves to understand others, it is possible for us to glimpse the world from their perspective. We consider that this is equally true in cross cultural encounters and that the scope to see things from other perspectives in addition to our own can only enrich our vision of language overall.

> Transposing ourselves consists neither in the empathy of one individual for another nor in subordinating another person to our own standards; rather, it always involves rising to a higher universality that overcomes not only our own particularity but also that of the other. The concept of 'horizon' suggests itself because it expresses the superior breadth of vision that the person who is trying to understand must have. To acquire a horizon means that one learns to look beyond what is close at hand – not in order to look away from it but to see it better, within a larger whole and in truer proportion. (Gadamer, 2013, p. 304)

These connections and expansions in perspective have been anticipated by others within linguistics. For example, in her exploration of ethics in current linguistics research practice, Rice argues:

> [F]ield linguists have ethical responsibilities not only to individuals and communities, but also to knowledge systems. Collaborative working arrangements are not truly collaborative if the linguist still controls the content and framework of the research, and the form in which it appears. A reexamination of what the study of linguistics is all about is not necessarily easy, but under the best of circumstances it will ultimately lead to deeper insights into language, combining different intellectual traditions. It is this opening of the mind that, in the end, makes this type of research truly exciting and empowering for all.
>
> (Rice, 2006, pp. 149–150)

A more encompassing approach makes it possible to hold different perspectives on language in mind, a step that also necessitates further modes of enquiry. For example, in thinking about how language is used and experienced in relation to spirituality, it is obviously necessary to move away from a positivist approach. What is needed is a framework for exploring the relationship between language and experience. The French phenomenologist Merleau-Ponty (1962) provides one starting point in this direction in his *Phenomenology of Perception*. Toadvine (2004) summarizes Merleau-Ponty's discussion of the relationship between language and the body, that is to say experience, in the following terms:

> The style of a word or a language would include its tone and accent, its gestural or emotional significance, which provides the original mode of access to its linguistic signification. This generalizable 'emotional essence' refers back to a mode of behavior or experience of the body as a 'natural power of expression.' The style of the word is a gesture, a comportment of the body, its way of vibrating or resonating with its surroundings. Such gestural significations–words, vowels, phonemes–are, Merleau-Ponty tells us, 'so many ways of singing the world' since they extract and, in the strict sense of the word, express the 'emotional essence' of things. The body squeezes the emotional essence out of things like juice from an orange, and style is this juice. Different languages, on this view, are just so many variations on the body's manner of expression, and the unique worlds that result are never entirely translatable. Style acts as the spark that arcs the gap between natural sense and conventional expression. (Toadvine, 2004, p. 276)

To a structurally trained linguist this may sound romantic and beyond the realm of linguistic study. However, the possibilities of such an approach are easier to appreciate when we keep in mind that it is not designed to replace a structural analysis. Rather, it gives voice to aspects of individual experience, internal phenomena that can only be reported and not observed. It reminds us of the place of language in connection with spirituality, land and identity. This broader view of language certainly resonates with the practice of calling out words on country as part of language revival. It tells us why language descriptions themselves can be valuable cultural artefacts.

One advantage of incorporating a similar approach into linguistic understandings of language alongside structurally oriented work is that it would allow linguists to talk about language in ways that some, perhaps many, communities can identify with and value. In providing a justification for descriptive and documentary linguistics and for the importance of the issue of language endangerment, it is likely that a phenomenologically based account of the loss involved could prove to be more compelling than an account based on a loss of particular grammatical features or lexical networks.

We see this type of loss in the example of Topura discussed in Section 3.3. While a linguistic analysis would focus on the deletion of the glottals and a corresponding change in relevant lexical items, for the community the loss of glottal phonemes is emblematic of a greater loss of cultural identity. This loss of culture has been a barrier to transmission of traditional knowledge as village elders have struggled to identify younger people with whom to share this knowledge. In statements about language loss, there is often allusion to these deeper issues, but only rarely does this extend beyond the domain of the richness of human knowledge to the sorely grieved for loss experienced by some communities or the irreplaceable nature of specific languages as expressions of human experience.

5.2 Practising cultural safety

We have argued that incorporating new perspectives on language into the discipline of linguistics will require linguists to hold contrasting perspectives on language more or less simultaneously. While linguists continue to make empirical investigations about linguistic behaviour and patterns using the powerful analytical concepts and tools available to them from the existing resources of the discipline, they could also develop more than a passing familiarity with other modes of knowledge about language that are made available to them by language speakers in their roles as ambassadors for the knowledge traditions their languages represent and are supported by the perspectives of other disciplines. Linguists' understanding of these other perspectives is no doubt enhanced to the extent that they become bilingual and bicultural. But simply learning other ways of being and doing is not enough to ensure that they are part of the *language's* community. Nor can they ensure that community perspectives on the language will be apparent in the language description, as it is constructed through the discipline for the gaze of outsiders.

The concept of cultural safety is a model of professional practice that developed in the Health Sciences to address issues of disadvantage in the health of Indigenous people. Cultural safety is concerned with the socio-historical context in which people from different groups come together. More specifically, it is defined as establishing

> […] an environment which is safe for people; where there is no assault, challenge or denial of their identity, of who they are and what they need. It is about shared respect, shared meaning, shared knowledge and experience, of learning together with dignity, and truly listening. (Williams, 1999, p. 213)

Linguists' work in communities is a professional practice that occurs in settings characterized by marked differences in access to a range of forms of power (Stebbins, 2012). We know directly from our own experiences as well as from

the experiences of others that it is not only community members who can be at risk when respect is not shared. Power imbalances create conflict and resentment that can be expressed in ways that cause damage to anyone, or indeed everyone, involved.

When an individual linguist (even a bicultural linguist), and a small set of language speakers bring their individual understandings of language to a shared task, they are likely to be functioning with different frameworks of *language*. Linguists' individual and cultural experiences and assumptions create their understandings of language, which differ from those of non-linguists. The mismatch is compounded when one group attempts to view the others' representations of language, potentially resulting in misunderstandings about the task, the methods and the goals. Linguistic data collection based on academic training focuses attention on linguistic structure and form, potentially limiting the ability to engage with the speakers' concept of language. As Nakata (2007) indicates, when speakers view a linguistic representation of their language, for example an annotated text collection, what they find may not match either their expectations of 'language work' or the intentions of the linguist.

One strategy for responding to this type of conflict is to be aware of and explicitly discuss the ways in which linguistic representations of language do not necessarily or directly reflect speakers' experiences of language. This allows linguists to explain their work to community members, as well as opening the opportunity to explore the community's perspectives on language. This approach also offers the discipline of linguistics the opportunity to expand and enrich its understanding of language. While an interest in these matters is hardly new, they continue to be at the periphery of much fieldwork activity and challenge our current methods of description. Grace (2006) notes that these types of changes within the discipline were anticipated by Hymes in 1964:

> Hymes used the term 'ethnolinguistic' to refer to an area of concern that included not only linguistic systems in a strict sense but also, in Hymes's words, 'the partial dependence between properties of linguistic systems (however narrowly conceived) on the one hand, and characteristics of their users and circumstances of use on the other' (1964: 6–7), in which the study of this dependence would constitute not simply an addition to the theory of linguistic form but would (1964: 44) 'in some significant respects entail its recasting'.   (Grace, 2006)

Inclusion of ethnolinguistic data would involve exploration of a broader concept of communicative competence including the notion of speakerhood and how it is enacted, the proper (linguistic) behaviour for specific groups of people within the community, the core values of the culture, the expression of these values through the language, and the theological and cosmological ideas informing religion

and world views as we described above. In our experience, speakers have told us directly that these areas of knowledge are foundational to the language work going on in the community. They have asserted that there is no cultural safety if these areas are not attended to, and they have expected us to take them into account in our linguistic analyses.

In Section 3, we saw how linguistic frameworks of language classification and speaker perceptions of language boundaries both use processes of matching their own sets of salient linguistic features to identify themselves and others. Acknowledging the different frameworks that underpin these processes of language differentiation and the meanings that these differences both reflect and represent enables the development of shared understandings of what language and membership in language groups means. In the case study presented in Section 3, knowledge was shared using culturally recognized methods including shared meals and *storying* about language, place and identity. The process of walking from village to village, accompanied by local people, traced the experience of the research across the land. This was a process of shared learning and discovery that enabled the voice of community members and linguists to be heard in the shared task of language development.

In order to create effective partnerships with communities, a commitment to cultural safety is required. In culturally safe relationships there is space for specific and different identities to be acknowledged and enacted. As we described in Section 4, linguists and community members can come together to discuss appropriate contents and boundaries of the research. In this joint process of negotiation, shared learning has begun. Establishing this direction in the early stages is a foundation for cultural safety as the work progresses.

Without a shift in perspective (without widening disciplinary horizons), it is difficult to do more than nod to these areas and, more importantly for this chapter, almost impossible to incorporate them into publications about the language concerned. As the discussion in Section 5.1 suggests, linguists do have a place to start on making space for these areas in their understanding of language. Section 5.3 closes this discussion with a review of places in which this type of knowledge is beginning to be recorded.

5.3   Other ways of creating language

Our discussion has shown that there are many aspects of the lives of speech communities that speakers present to us as being important. These may include an understanding of (the history of) social relations within the community, or between the community and neighbouring groups; aspects of the local cosmology; and so on. It is now common practice to mention some of this knowledge in

the introduction to a grammar under headings such as 'Sociolinguistic context' or 'Cultural context', but there is no established way to integrate this information into the language description at a deeper level. This is a trivial point in a certain sense. For example, linguistics does not consider spirituality particularly relevant to language and therefore does not study it in relation to language. In another sense the trivialization of human linguistic experience confronts us as linguists with some profound questions about the implicit choices that are made by the discipline.

Close work with communities challenges linguists' assumptions about what information is important as well as what must remain private. Particularly through the efforts of documentary linguistics, the discipline is gradually developing new ways of recording a more diverse range of materials. Even within the descriptive tradition, there have been changes in emphasis, for example the increasing focus on dictionaries that provide a space, through encyclopaedic definitions, for cultural notes and example sentences. Speakers who are active in developing descriptive material can use these documents as a place in which important particularities can be signalled.

Clearly, a great deal more could be done here. In-depth research on specific lexical sets in endangered languages is one avenue for exploring the meanings of words in contexts more deeply. A notable early example of a research partnership that foregrounds local perspectives may be found in Majnep & Bulmer's (1977) *Birds of My Kalam Country*, a beautiful book and detailed account of ethnobiological knowledge, which allowed for the recording of cultural information that may otherwise have been lost. In a review of this partnership, Marcus (1991) notes that:

> […] the [Saen] Majnep- [Ralph] Bulmer relationship stands out from the history of sustained collaborations […] in the extent of Ralph's willingness to compromise his own authority and authorship by introducing Saem into the professional presentation of their research. While Ralph downplayed any experimental claims or ends, the decision to bring Saem so far into his academic world of discursive practices and intentions […] was bound to have led to the production of texts that would radically depart from the conventions of ethnographic writing.
>
> (Marcus, 1991, p. 37)

The importance of our themes of place and identity were identified by Manjep in the epilogue to this book. As Marcus (1991, p. 42) notes, place and memory are the ground on which the description has been laid out. The epilogue is entitled *How I walked about with my mother and she showed me these places*.

> Now that I am finishing this book I want to explain about the parts of the forest that I know well, so that those who read this will know where I have seen the things that I have described…
>
> [Four paragraphs of description of the forest here]

These places I know about. When I was older I went to them by myself, or with my brothers. Since then I have travelled round in many other places too, but the places that I truly know well are those my mother first showed me. When I wander there, I remember what my mother told me, and the things that my father did there.

Sometimes when I am in town I get fed up and walk about by myself, and I think about these places that I knew when I was a child, and I know that I must go back there. That is all that I wanted to say, to finish this book.

<div style="text-align: right;">(Majnep & Bulmer, 1977, p. 184)</div>

Also relevant here is the paper by Peile (1996) which beautifully sets out Kukatja ethnobotanical knowledge (Western Desert, Australia) by interweaving comments in language by speakers about the workings of the botanical world with additional word lists and commentary. In describing the life-principle of plants, for example, we read that:

(2) *Kurrunpa kanyinytjarra tjarlu-rriwa.*
     spirit   inside   big-become

     Kurrunpa ngara tjarlu-rii   malalpa-rri marraka-rri
     spirit   stand big-become big-become strong-become

     yintarra-rrinytja-ngka
     large:plant-become.NOMINALIZATION-ADJUNCT

     'The life-principle inside [a plant] becomes big. The life-principle remains [there]; it becomes big and strong when it grows into a large plant or tree.' (Peile, 1996, p. 79)

Earlier, Peile comments:

Details of the food and medicinal plants used by the Kukatja and their Dreamtime significance are beyond the scope of this paper. But with regard to this significance, it should be pointed out that particular plants grow, develop, flower and fruit in the way that they do because they did so in this way in ancestral times and accordingly must do so today: this is the Law.

<div style="text-align: right;">(Peile, 1996, p. 72)</div>

The research in Milne Bay described in Section 3 explored language identities in relation to orthography development. The establishment of schools in local languages required communities to have orthographies in place. In order to qualify for schools where their children could learn in their own language, community leaders engaged in the process of language development, in the form of preparing orthography guides and books. For many, this was the first time they had seen their way of talking written down. These books included word lists and texts that were illustrative rather than exhaustive, intended to demonstrate how the language

could be written and not to meet the needs of the comparative-historical linguist. These books fulfilled a specific purpose for the community but had no particular standing in the context of linguistics.

Language can be represented in numerous ways. Text collections are a means of providing space for materials that the community want to be recorded. Different formats are needed for the community and for linguists because interlinearized texts, although standard within linguistics, are alienating and difficult for outsiders to read. How such work could be legitimized within the discipline, by peer-review and publication, is a question that a number of linguists in the field are currently concerned with. Language recording and transcription, both well-established ways of recording language information, are considered marginal academic outputs that do not contribute to a linguist's academic standing. This underlines the difficulties that practitioners of linguistics face in broadening their responses to the needs of the communities in which they work. Even well-established ways of recording language are not legitimized as having academic standing. This has potential to undermine the integrity of our relationship with the community.

As we have written this paper we have paused at regular intervals to consider whether something we knew was appropriate to write about in this context and for this audience given the expectations of the speakers who originally shared their knowledge with us. Part of our concern in this area relates to whether or not we are entitled to make these kinds of representations of the language. As outsiders to these language communities we will never reach a level of knowledge of the language that is equivalent to that of well-informed community members, since much of this knowledge and the capacity to fully understand it is acquired during early socialization. Perhaps a shift to a more culture-centred focus in language work also requires a shift to a more community-centred set of agents in the work, such as the culturally safe partnerships described above. This would help in addressing often-voiced community concerns relating to authorship, acknowledgement and the ownership of knowledge.

6. Conclusion

We have argued that languages are shaped as much by the socio-historical contexts in which they are known as by the social, cultural, historical, and natural environments in which they are used. When linguists work with speakers and create descriptions of languages, the discrepancies between linguistic and non-linguistic perspectives on language are thrown into sharp relief. This has potential to cause significant levels of dissatisfaction and even conflict. It is easy

for linguists, as outside experts, to maintain the boundaries of the discipline by excluding or omitting facts and practices that do not fit within disciplinary expectations.

Finding ways to recognize and accommodate these different perspectives and ways of using language has two significant benefits for the discipline. Firstly, a stance that respects the knowledge systems in place in the community contributes to the practice of cultural safety, strengthening working relationships and improving the quality of the data that we collect for our own ends. Secondly, as others have noted before us, these other ways of knowing have the potential to enrich our discipline if we are willing to allow it to be transformed.

Rather than focussing on legitimising languages by objectifying them in the creation of linguistic descriptions, this paper has suggested alternate ways of viewing language as it is legitimized in the culture and identity of its speakers. Rather than being an object of study, this allows language to be an expression of identity and personhood. In this approach, speakers are also no longer objects of study but active partners in the creation of their languages.

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