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Language attrition and language change

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1 Introduction¹

People change the way they talk for social reasons, wanting to make themselves understood, and wanting to speak like the people they admire (accommodation) or to differentiate themselves from the people they don't want to be like (divergence). People also change aspects of the way they talk in order to express new ideas, new practices, and new things. This affects mostly vocabulary, but syntactic and morphological structures may also change under the pressure of new language technologies, such as writing, and the need to be concise for speed of production.

'Ways of talking' is a useful term for describing speech in communities where everyday conversation contains much code-switching and many multilingual conversations. Over time, shifts in ways of talking may move from being in-group talk and special registers to becoming new varieties or mixed languages, and then finally to splitting off as distinct languages.

Shifts in ways of talking are usually influenced by deep changes in the societies in which people live. The changes could result from actual movement of people, whether by speakers moving from their homes (emigration), or by speakers of other languages moving in (colonisation or invasion) (see Heggarty, this volume), or more recently from virtual movement (the arrival of other ways of talking through writing, radio, television and the internet), or from the introduction of new technologies. The changes in ways of talking range from those as apparently small as a shift in phonetic realisation where comprehension is unaffected, or the introduction of a new terminology set for new machines and their operation, to changes as large as a complete shift to another language, so that many people who could once understand each other can no longer do so.

For this chapter, I will first outline the terms used to label phenomena associated with language attrition, then discuss social, psychological and linguistic factors involved in these phenomena, then consider variation, and conclude with instances of change, starting with highly visible changes in vocabulary, phonology, morphosyntax, and concluding with changes in ways of talking.

2 Terms

Changes in ways of talking can be viewed from different standpoints – of the past or present ways of talking, of the structure of the way of talking, and of the position in time of the

speaker. Labels reflecting the disappearance of a way of talking include 'first language attrition' (Dressler 1991), 'language loss', 'language obsolescence' (Dorian 1989; Jones 1998), and 'language death' (Dorian 1981; Brenzinger 1992). Focusing on the people who use these disappearing ways of talking produces labels such as 'heritage speakers' (Kondo-Brown 2006), or 'terminal speakers' (Dressler 1991); focusing on their perceived deficits produces labels such as 'incomplete acquirers' (Schmid 2011) and 'semi-speakers' (Dorian 1981). Focusing instead on the development of new ways of talking produces labels such as 'language convergence', 'code-switching', 'pidgin', and, if the new ways of talking become the first language of the next generation, 'mixed language', 'creole' to denote the new way of talking (O'Shannessy 2006; Meakins 2011), and 'incomplete acquisition' (Sasse 1992) or 'impeded acquisition' (Cook 1995) to denote the changes to the old way of talking. Focusing on the social conditions of language contact and the linguistic phenomena resulting from this has led to the development of a field of contact linguistics (Thomason and Kaufman 1988; Van Coetsem 1988; Winford 2007). The considerable literature on second language acquisition and bilingualism has much to say about the effect of a speaker's first language (L1) on their acquisition of a second language (L2), through concepts such as interlanguage and transfer effects (Pavlenko 2000; Tóth 2007). In this chapter we focus on the other side of the change: the changes in L1, encompassed in part by the label 'language attrition', and in part by the labels 'subtractive bilingualism' (Fillmore 1991), 'incomplete acquisition' or 'heritage speaker bilingualism' (Pascual y Cabo and Rothman 2012). We now examine these.

'Incomplete acquisition' or 'heritage speaker bilingualism' is the result of acquiring a heritage language as a child either in a multilingual community in which the heritage language is not the dominant language, or by shifting from a community in which the heritage language is dominant to one in which it is either not spoken, or not spoken as a dominant language. 'Heritage speaker bilingualism' focuses on bilingual communication involving a greater or lesser proportion of the heritage language. 'Subtractive bilingualism' indicates that the learning of a second language can hinder development of the first language. The term 'incomplete acquisition', 'impeded acquisition' (Cook 1995), along with the terms 'semi-speakers', 'forgetters' (Sasse 1992) and 'rememberers', focus on the degree to which the variety spoken by the acquirers differs from that of previous generations. They encompass situations ranging from fluent speaking of a radically changed variety to the situation where people cannot produce fluent utterances but merely remember a few words (types of change are discussed later).

The terms 'incomplete acquisition' or 'heritage speaker bilingualism' cover both first generation migrant children, and second generation migrant children maintaining to some degree their heritage language, as well as children growing up in autochthonous communities that are undergoing language shift. In both situations new varieties may develop, with labels such as 'Australian Italian' (a cover term for various dialects of Italian spoken in Australia over several generations), focusing on the continuity with the old way of talking. Examples from Australian languages include 'Young People's Dyirbal' (Schmidt 1985), 'Modern Tiwi' (Lee 1987), and 'Teenage Pitjantjatjara' (Langlois 2004). What the heritage speakers/incomplete acquirers actually speak may be a shared variety used, say, by groups of second generation immigrants among themselves, or it may be highly variable, being, for example, the way that particular people in a family speak to their grandparents (rather than between each other), or in restricted domains such as school bilingual programmes (Jones 1998). The new varieties may sometimes be mixed languages, as the new Australian mixed languages 'Light Warlpiri' (O'Shannessy 2006) and 'Gurindji Kriol' (Meakins 2011), drawing from both the old way of talking and the language of the people whose influence has become dominant.

The results of growing up in a bilingual environment are the focus of the terms 'incomplete acquisition' and 'heritage speaker bilingualism'. In contrast, the term 'language attrition' has been restricted to losing a language which one has spoken into adulthood. Schmid defines it as 'the total or partial forgetting of a language by a healthy speaker' (Schmid 2011: 3). The speakers still have a means of communicating; it is just not the language they learned as children. (I discuss below this 'forgetting'.) After speakers have shifted completely to speaking another language most of the time, they may gradually find it harder to speak their first language. When talking with a linguist, they may find it harder to recall words or to put together sentences fluently without hesitations and pauses. Schmid argues that 'language attrition' is an advanced stage of the influence of L2 on L1 and distinguishes language attrition in degree, and perhaps also in kind, from 'incomplete acquisition'.

For Schmid, language attrition is a term which covers both the process and result of:

- Type 1: The erosion of first language (L1) or second language (L2) competence and performance of an individual speaker for medical reasons (e.g. aphasia).
- Type 2: The erosion of L2 competence and performance of an individual speaker resulting from speaking another language (L1 or L3) most of the time for a long period.
- Type 3: The erosion of L1 competence and performance of an individual speaker resulting from speaking another language most of the time for a long period.
- Type 4: The erosion of a shared language system across an original speech community resulting from many members speaking another language most of the time for a long period. This would include communities which have been multilingual for generations.

Types 3 and 4 are intimately linked, in that a speech community is made up of individuals whose language practices change. The language practices of an individual affect and are affected by those of the people they interact with – what language(s) they use, and how they talk. The kinds of language changes that take place among a group of speakers are constrained by the speakers' desire to be understood, and to be part of a group. Communication needs and group cohesion thus constrain change to some extent; but an isolated speaker without much opportunity to use their first language has no such constraints on the way they talk.

Type 3 speakers are commonly found when speakers have left their L1-speaking homeland to live in a different speech community, but they may be found in speech communities (autochthonous or not) in multilingual countries. Type 4 communities may develop from processes of chain migration or through major resettlements of refugees and displaced people, i.e. immigrant communities separated from their L1-speaking homelands. But they can also be found as autochthonous speech communities affected by the immigration of speakers of other languages, or in multilingual countries.

For considering historical change of a particular language, and the processes of historical change then, the relevant studies of language attrition are those that study a group of speakers (Type 4), rather than individual case studies (Types 2 and 3), important though the latter are. That is, we need to distinguish mastery of a language by an individual, and mastery by a speech community – and so distinguish between differential knowledge distributed across a community, and the erosion of an individual's language.

Once we consider a language as the behaviour of a community of speakers, as in Type 4, rather than only as a system in the mind of an individual, then we must widen the class of speaker to include not only those covered by the label 'language attrition' – people who learned the language fully and used it into adulthood (as in Schmid's definition) – but also the subsequent generations² of 'heritage speakers', 'incomplete acquirers', 'semi-speakers',

'terminal speakers' (Tsitsipis 1989; note that Tsitsipis also uses this term for some speakers of Type 3). This is because people don't only talk with their peers; the speech of a community comprises the ways of talking among all members in all domains about all things. So it comprises talk by adult learners of the incoming language, and child heritage language learners. The input for the child heritage language learners in constructing their grammars is multilingual – from the incoming language and from the heritage language spoken with varying degrees of fluency, and from any other languages.

Thus, for understanding historical change, understanding the practices of both kinds of speaker is essential: those who acquired the new ways of talking as adults (and are undergoing language attrition), and those who acquired both the old way and the new way of talking as children.

3 Social and individual factors leading to change

Individuals talk and change how they are talking. Their ways of talking may or may not diffuse through a speech community; whether and how they diffuse is a social phenomenon (Winford 2007). Thus, language attrition can be seen in the light of the individual and to the community.

For individuals, how much effect learning a second language has on their first language depends on: how old they were when they began learning the L2, how long they spent in an L2 speech community, what proportion of time they spent using L1, and their mastery of L2 (including how native-like the mastery of L2 is perceived by native speakers of L2 [Major 1992]). Individuals will differ as to the contact they have with speakers of the incoming language (L2), whether as traders, cultural brokers, colonised subjects, students and so on. They will vary as to whether they are using their old ways of talking (L1) in separate domains from L2 (a largely monolingual use of L1), or whether L1 and L2 are used in many domains with different degrees of code-switching (Schmid 2007). They will also vary in their attitudes towards the other language(s), whether they embrace it or resent it. Some work (Kabatek and Loureiro-Porto 2013) has been done on modelling changes using social factors such as relative prestige of languages and volatility (whether this allows for change within a language, or whether it allows for shift from one language to another), and linguistic factors that are claimed to play a role in bilingual acquisition, causing acceleration (where bilinguals show accelerated acquisition of a category) or delay (where acquisition is delayed). Delayed acquisition is likely to be relevant to language attrition, since delay may lead ultimately to categories not being acquired at all.

Communities differ in terms of the type and intensity of contact with other speech communities. They vary greatly as to how old and new ways of talking interact, and as to how contact speeds up changes in the old ways of talking. Thus in some communities there is clear domain separation of language use (e.g. the maintenance of German by Old Order Amish in the United States) and change may be slower; in other communities there is massive code-switching, borrowing, and variation in ways of talking depending on the interlocutor, the topic and where the conversation takes place.

These different conversational practices will have different results; some will result in attrition and loss of L1 with replacement by L2, while others will result in maintenance of both L1 and L2 in modified forms, perhaps showing convergence. Others will result in attrition and loss of L1 with replacement by a new variety, whether a creole or a mixed language, resulting from the interaction of L1 and L2.

As language practices shift, it becomes harder to define what a speech community is (Tsitsipis 1989), because use of a shared language is no longer the defining criterion. Instead, a community may consist of people who live in the same village, for example, and who talk with other community members every day, but one of whose languages is only spoken by an enclave minority of speakers in the community (Maher 1991). In their talk, they switch from one language to another to varying degrees, and may have varying degrees of mastery of one or other language. This is quite common in remote Australian Indigenous communities today, where older speakers may speak one or more traditional languages as well as a pidgin or creole, and may be code-switching between them depending on who they are talking with, while younger speakers may speak a creole and code-switch with something close to colloquial English, but retain a passive knowledge of the older speakers' traditional language (Wigglesworth and Simpson 2008).

4 Variability: the seeds of change

The collective mastery of the traditional ways of talking is eroded, as people shift from speaking one language to speaking another, and as the opportunities decrease for them to speak their first language with other people. Intensity of contact has been proposed as a major factor driving change (Thomason and Kaufman 1988). However, caution needs to be exercised here. No interaction was found between the measures of attrition and frequency of use of the L1 in everyday life in Schmid's (2007) study of word retrieval, diversity of word choice in story retelling and pauses among L1 German speakers living in Canada and the Netherlands (although there was some language attrition compared with a control group of German speakers living in Germany).

Loss of collective mastery of a language in a bilingual community means that people unused to speaking L1 will then diverge in how much they forget of the L1. This ranges from the easily visible lexical divergence to the more invisible grammatical aspects, and creates the impression of great variability. Variation in pronunciation is well-known; Dressler (1991) notes it in Breton and cites reports of this in several other endangered languages. Maddieson *et al.* (2005: 255–256) observed variation in progress in the endangered language Lowland Chontal (southern Mexico); an older speaker had less variability in her production of an ejective affricate than a younger speaker who produced five different variants in eight tokens. The variation may increase as children growing up in the bilingual speech community have different levels of exposure to their parents' first language and the dominant language, and different levels of use. Maddieson *et al.* (2005) suggest that, while variation increases as people lose mastery of the language, the phonology of the dominant language (Spanish in this case) may ultimately lead to stable Chontal pronunciation converging on Spanish. However, Cook (1995) shows great phonetic variability in Stoney and Chipewyan (Canada) and argues that this maintains intralanguage divergence, rather than reflecting a shift towards English or Cree.

Impressions of wide variation among speakers may also be gained simply because, when those speakers stop using their first language for everyday talk, they may forget different things. When faced with a linguistic elicitor, a speaker may remember a word from their L1 for the idea at hand, or may be unable to recall words for that idea, because they normally talk about that idea using a word borrowed from L2. Still another speaker may have more contact with speakers of a different language, and so use a word from L3 for that idea. One person may remember words for local medicines; another may remember ways of describing making artefacts. Speakers may be unable to recall how in earlier times adults expressed particular inflectional categories on irregular nouns or verbs, and they may

regularise the irregular inflections and generalise the regular way of expressing those inflectional categories. They may be unable to recall how they expressed switch reference in rarely encountered contexts (e.g. 'I showed you to her while sitting on the grass'), and they may express the same idea using a periphrastic construction. But if one person regularises tense endings, and another substitutes endings from a neighbouring language, and a third maintains irregular endings, this may give the impression of greater variation in the language that is being replaced than that in a language which is used every day. An example of variability in Modern Tiwi (northern Australia) is given by Lee (1987: 84–88). She shows the difference between older speakers of Tiwi and younger speakers in assignment of noun classes to loan words – an older speaker gave the expected forms; some young children could give appropriate forms while others could not. Some gave appropriate feminine forms but not plural forms; others gave appropriate plural forms but not feminine forms. These situations are familiar to linguists carrying out fieldwork with the 'last speakers' of a language.

Thus, language attrition is an extreme case of rapid shift within a language as speakers move to speaking another language. Jones (1998) suggests that language attrition differs from what is expected as normal intergenerational language change only in the rate and number of changes, and the contact context. This raises the question of what changes are due to cross-linguistic transfer from other languages, and what changes are internal changes whose pace is accelerated by the contact situation.

Our understanding of the processes by which speech communities shift languages is limited by the scarcity of studies of shifts as they are happening. There are plenty of before-and-after studies focusing on historical changes in a language, based on written records, e.g. the attested changes in English from Old English through Early Modern English to Modern English over many centuries. These give us pictures of relatively stable language systems before the shift, and a different stable language system after the shift. But language shift can take place over a generation, and there are few accounts of the variable ways of talking as a speech community shifts over a few years, whether from a stable situation of speaking more than one language to speaking just one language, or from being monolingual to being multilingual or to being monolingual in a different language.

The rapid language shifts in Australian Indigenous communities provide new evidence to address these gaps in our understanding. In many communities, people have shifted from speaking a traditional language to speaking an English-based creole within a couple of generations. For Australia, we now have grammatical descriptions (but mostly not in the same communities) of the languages of the last speakers (e.g. Gaagadju [Harvey 2002]) and of younger community members (e.g. Young People's Dyirbal [Schmidt 1985]). We also have grammatical descriptions of new ways of talking: the development of traditional language koinés (e.g. Dhuwaya [Amery 1993]), the development of creoles (e.g. Kriol [Sandefur 1979]) and of mixed languages that have developed over the last 40 years from contact between a creole and traditional languages: Light Warlpiri (O'Shannessy 2006, 2012, 2013) and Gurindji Kriol (Meakins 2011).

This data has cast new light on language contact and mechanisms of change; for example evidence has been adduced to argue that mixed languages can emerge from code-switching (McConvell and Meakins 2005; O'Shannessy 2012; Meakins and O'Shannessy 2012). There is thus no hard-and-fast distinction between seeing these Central Australian mixed languages as extreme cases of attrition of the first language of the previous generation, or as extreme cases of local languages influencing an incoming creole.

Most importantly for understanding language shift, we now have data on the variability of the languages used in everyday conversation, both within the creole continuum (Disbray and Simpson 2005; Disbray 2008) and between the mixed language and the traditional language. In the latter case, careful recording of natural conversation and elicitation has allowed O'Shannessy to show that what is at first glance the same ergative ending in Light Warlpiri and Classical Warlpiri has overlapping but not identical uses and forms in children's production of Light Warlpiri and Classical Warlpiri (O'Shannessy 2006). In time we should have longitudinal studies, showing how in situations of intense contact, lack of use of L1 leads over time to attrition in individuals, such as that hinted at in written records more than ten years apart of the last speaker of Vegliote (who lived on the island of Veglia in the Adriatic). The later records show a collapse of present and imperfect (Maiden 2004) which is less apparent in the earlier records of the same speaker.

5 Linguistic factors leading to change

The language contact situations that lead to language attrition involve not only social and psychological factors such as intensity of contact and attitude towards languages, but also linguistic factors.

Some proposed examples of linguistic factors involved in bilingual acquisition are discussed by Lleó and Cortés (2013 with respect to bilingual Spanish–German children growing up in Germany and in Spain). The most important factor is *frequency* (how common the form is in the input, and whether it appears in all languages in the input). Categories that are heard frequently are likely to be adopted ahead of those that occur only rarely. High frequency of occurrence is suggested as relevant for the bilingual Spanish–German children acquiring closed syllables which are very common in German, and which are also present in Spanish. Bilingual children in both countries acquire them rapidly. Low frequency of spirants (found only in Spanish) and their complexity of allophony are given as possible reasons for delay in acquisition of Spanish spirantisation of voiced stops by bilingual Spanish–German children growing up in Germany (as compared with bilingual children growing up in Spain). This would lead to a prediction that in a language attrition situation where German was the dominant language, Spanish spirantisation would be lost.

Lack of frequency in input was proposed by Richards (2001) as the source for the divergences between Old Lardil (an Indigenous language of northern Australia) and New Lardil. He argues that divergences arose from regular language change processes accelerated by the scarcity of Lardil data in the input to children in a changing social environment. These processes involve most notably loss of regular morphophonological rules and reanalysis of augments as part of a base. The losses and reanalysis arguably represent Lleó and Cortés' linguistic factors of *complexity* (categories with more allophones or more allomorphs are said to be more complex) and the related *uniformity* (preferring forms that remain constant in phonetic contexts and in paradigms). Lleó and Cortés exemplify uniformity with the late acquisition of Spanish nasal assimilation across word boundaries within a phonological phrase (it is argued that uniformity is violated by the different forms of nasal-final words such as the indefinite article before words beginning with consonants at different places of articulation). Their final factor is *markedness* (the unmarked counterpart is more common in the world's languages). Markedness may underlie delayed acquisition of long vowels by German–Spanish bilingual children. Again, this may not be independent of frequency in a language contact situation, if frequency in all languages in the input is taken into account.

6 Types of change

Many changes are possible in language attrition. A major concern has been to distinguish between internal changes (perhaps accelerated by the contact with other languages) and changes due to transfer from the other language(s), whether borrowing, shifting or creating new structures different from either source language (Van Coetsem 1988; Pavlenko 2000).

Some changes fit the description of language attrition as 'forgetting'. These include changes due to borrowing – replacement of an L1 word by an L2 word, but may also include loss, where the speaker remembers that there was a word for something or idea (say a bird or plant or artefact), but not what it was, and does not know the L2 word for it – if there is an L2 word for it. They may include internal changes, using more general words ('go' instead of 'fly'), or extending denotations, e.g. using one word for 'bush honey' in Modern Tiwi, compared with 14 words for different types in Traditional Tiwi (Lee 1987: 84).

Which areas are more liable to loss is the subject of theoretical debate. Van Coetsem's 'stability gradient' (1988: 25, see Lucas, this volume) proposes that change in the lexicon will take more quickly than change in phonology and core syntax, both in language contact situations and in internal change. Differences in stability between these domains depend in part on frequency, but it is not the only factor.

The abruptness of the changes is also a topic of discussion. Myers-Scotton has hypothesised that the effect on L1 of shifting to another language will be abrupt, by which she means that utterances that are intended to be in L1 are unlikely to contain the 'critical grammatical morphemes' of the L2 (Myers-Scotton 2007). 'Critical grammatical morphemes' are said to fall into two types: 'bridge' late system morphemes which are essential for grammaticality (e.g. English 'of' links nominals together: *cover of the book*; English requires an empty 'it' as subject of weather verbs like *It's raining*) and 'outsider' late system morphemes, like subject-verb agreement, where the form of the verb depends on information outside the verb phrase from the subject. In effect, this is saying that the core grammar of L1 will resist influence from L2. This was borne out in her study of interviews with 48 young Xhosa-English bilinguals, whose L1 was primarily Xhosa. 'Critical grammatical morphemes' were not found in their Xhosa, or Xhosa-framed code-switched utterances.

However, Myers-Scotton also predicted that some shift of the L1 grammar towards the L2 grammar would take place in non-core areas, for example in the order of adjuncts. She found little evidence of this, apart from double-case marking, where an English locative preposition co-occurred with a Xhosa locative prefix. Such double-case marking is found sometimes in Central Australian creoles (Disbray and Simpson 2005: 83). For the similar mixed languages Gurindji Kriol and Light Warlpiri, Meakins and O'Shannessy (2012) refine Myers-Scotton's approach, considering boundedness and transparency of the transferable morphemes, and structural congruence of the position in the new language as the key. Structural congruence is related to the question of 'language distance' raised by Van Coetsem, that is, whether the typological differences between the two languages will play a part in determining the kinds of changes that take place.

Different taxonomies have been proposed to describe the types of change from within different viewpoints, for example from the viewpoints of historical linguistics and contact linguistics there is the work of Thomason and Kaufman (1988), Van Coetsem (1988) and Winford (2007) who focus more on speech communities. Pavlenko (2000) presents a view from the fields of bilingualism and second language acquisition, which focuses more on individuals. She proposes five classes of change in language attrition: borrowing, convergence, shift, restructuring and loss, summable as *loss* (losing L1 elements), *convergence* (creating

new subsystems distinct from both the L1 and L2, which is different from shift to L2 or modification to make more like L2), *borrowing/restructuring/shift* (taking L2 elements or systems into L1). This last is complex; it includes borrowing of lexical items as well as Pavlenko's definition of 'restructuring' as 'incorporation of L2 elements into L1 resulting in some changes or substitutions (e.g. syntactic restructuring whereby L2 rules are incorporated into L1 grammar)' and 'shift' as 'a move away from L1 structures or values to approximate L2 structures or values'. Note that Pavlenko's use of 'convergence' is more restrictive than many uses of this term by other authors which she would classify as 'shift', and that while her use of these terms resemble those used by Lucas (this volume) and Van Coetsem, she is restricting them to effects on L1, which is relevant for language attrition.

We turn now to attrition within particular grammatical domains.

6.1 Lexicon

One of the most obvious signs of language contact is change in the lexicon, because, as Schmid (2011) notes, it is relatively easy to learn new words. It is widely accepted that the lexicon is more subject to change than other parts of the grammar (Van Coetsem 1988).

It is also quite common that when speakers of one language (LA) come into contact with speakers of another language (LB), they may also encounter new things (objects, ways of doing things, practices, ideas), all of which LB speakers may have names for. If the LA speakers need to express these new things, they may do so by devising expressions (words or phrases) within their own language, or by borrowing the LB names. Such borrowings are the most evident trace of contact between speech communities before the coming of sound recording. I have observed examples of such early borrowings in the Central Australian language Warlangu: objects (*makiti* 'gun' < 'musket'), ways of doing things (*brandim-ti* 'brand cattle'), ideas ('work' and 'holiday'), and practices ('ration' – ration as food given by station-owners or government agents to Aboriginal people). Borrowings may be particularly prolific when massive changes in technology and economy mean that the people of a speech community change their ways of life and no longer need the terminology of old ways of living, whether of traditional crofting practices in Scotland, or of traditional hunting and gathering for speakers of Australian Indigenous languages, or subsistence farming for immigrant Greek communities in Australia. Once a speech community has taken to large-scale borrowing of technical and everyday loanwords from a high status language, this may then have a detrimental effect on the prestige of the L1 borrowing language. A reduction in the prestige of the L1 may then hasten the decline in use of that language by favouring a shift to the high status language. Watson sums up the situation as follows:

The dual phenomenon of [borrowing] such technical and colloquial loanwords has the effect of making the languages appear more like patois to nonspeakers and, at the same time, reducing the confidence of the native speakers themselves in their language.

(Watson 1989: 50)

Whole semantic fields may change or be greatly expanded; for example changes in counting systems such as the loss of the Irish Gaelic vigesimal counting system in favour of a decimal system (Watson 1989), or the language engineering development in some Australian Indigenous communities of counting words driven by the need for children to learn a decimal system in early primary school, and by the fact that most of these languages do not have

decimal systems, and may only have monomorphemic words for 'one, two' and perhaps 'three' or 'several' (Bower and Zentz 2012).

Within semantic fields there may be large-scale changes which create new mixes of form and denotation. For example, in many Australian Indigenous languages the kin terminology involves calling one's mother's sisters by the same term as one calls one's mother, and so calling one's mother's sisters' children by the same terms that one calls one's brothers and sisters. There may be reciprocal terms for grandparents and grandchildren, and these may be divided into separate terms for mother's mother, and father's mother, and for daughter's children as opposed to son's children. However, the switch in many communities to a creole or a variety of English has led to the creation of a set of kinterms whose forms come from English, but whose denotations are either transferred directly from the traditional language or which have evolved from the denotations in the traditional language.

	Traditional language	Modern talk
Mother	X	mum
mother's sister	X	mum [often first name is added, Mum Annie]
Sister	Y	sister
mother's sister's daughter	Y	sister, cousin-sister
mother's mother	Z	granny
daughter's children	Z/A	granny

These changes exemplify Pavlenko's 'convergence' in that a new system of kinship has evolved, drawing on L1 ideas and L2 forms.

Methodologically, it is not always easy for an outside observer to determine the extent of cross-linguistic transfer accurately. For example, with loanwords it is not always easy to determine whether an L2 word is being used in code-switching, or whether it has become part of the L1 (this is especially true if there is no need for inflection, and if the phonology and phonotactics of the borrowed word happen to conform anyway to those of the L1; Boyd 1993). It may also be because speakers use the L2 word commonly in informal speech, and mostly use the L1 word in formal speech, or in speech to an outside observer where they are consciously representing their L1 speech community. In the latter, speakers may try to replace English loanwords with a translation equivalent or paraphrase from their L1, whereas normally they might use the English word freely. When the L2 word or expression is used frequently in everyday talk, this may bring about loss or reduction in a speaker's L1 lexicon; that is, when L1 speakers find it hard to bring to mind words from their L1 lexicon. Loss occurs not only because of replacement by the L2 translation equivalent, but also because of changes in ways of living. For example, the looked-for L1 word may be a word denoting something for which there is no everyday word in the L2, but which the speaker has not used for a long time (e.g. the name of a plant, or species of animal that is locally extinct).

Beyond loss of forms and borrowing of forms, ways of expressing ideas may be borrowed (Pavlenko's restructuring/reanalysis). Loan translations may come in; they are quite common in Warumungu translations of institutional English. For example, the idea of 'help' (for which there is no equivalent Warumungu verb) is calqued from English in this translation as 'give someone hand'.

- (1) *Counselling Service-jja* *ajurnu* *murnarri* *nyu-njan*.
 Counselling Service-ERG 3PL.OBJ hand give-PRS
 'The counselling service gives them a hand.'

Expressions can be changed through reanalysis of an L1 expression using L2 morphemes and/or rules or selectional restrictions and subcategorisation frames: Schmid (2011: 28) illustrates this from a German American speaker saying 'die Mühe genommen' using *nehmen* 'take' rather than the expected *machen* 'make' (calqued from English 'take the trouble').

Changes in the lexicon may also result from internal changes which are affected by the other language. An example of L2 influence on L1 production is provided by Pavlenko and Malt (2011) who tested Russian immigrants to the US with respect to naming a class of everyday household items, drinking-vessels. Their subjects were adults: native Russian speakers, native English speakers, and bilingual Russian-English speakers. These were divided into three groups: arriving in the US before the age of 6 ('early arrival' bilinguals), between the ages of 8 and 15, and between the ages of 19 and 27. L2 → L1 influence was shown, in that all three groups of bilingual Russian-English speakers showed some shifts in the denotations of the Russian words compared with native speakers of Russian. Unsurprisingly this tendency was strongest in the 'early arrival' bilinguals. The shift included narrowing of the denotation of one word, and widening of the denotation of another, but in both cases the shift resulted in denotations more closely resembling their English translation-equivalents. How much this is due to push-pull effects within a semantic field is unclear (i.e. if the early arrivals lost a term denoting a particular object, this would influence either extending the denotation of another term, or borrowing to take its place).

6.2 Phonetic and phonological

Changes in the sound systems of languages undergoing attrition have received considerable attention, both as to the kinds of changes (at the phonetic level, at the level of phonological contrasts, or in the phonotactics) and as to the motivations for the change, whether externally motivated or internally motivated (Van Coetsem 1988; Pavlenko 2000).

Lexical borrowings may introduce new phonological contrasts and new phonotactic possibilities into the language, depending on the extent to which the speakers nativise their pronunciation. The extent of nativisation may vary considerably from people who acquire the L2 as adults, and those who acquire it as children. Age effects are commonly noted; late bilinguals usually fail to pass as natives on accent (Lengeris 2012: 26). Social effects are also noticed, and are particularly strong when dialects, rather than mutually unintelligible languages, are involved (Siegel 2010). For example, Australian English lacks post-vocalic /r/, but speakers may return from long periods in the United States using post-vocalic /r/ because they have accommodated to American English. If this pronunciation is stigmatised in their social networks, they may then abandon it. Watson (1989) claims that sometimes speakers of a dialect of an endangered language may change the pronunciation of some sounds or words to make them more similar to the pronunciation in a more prestigious, or more standard dialect. They may not succeed in reaching the target, and hypercorrection has been proposed as a source of change (Labov 1972). The phonetic and phonological changes are less likely to be even semi-conscious among speakers in the second generation.

A bilingual has two phonetic and phonological systems. These can interact and influence each other, and they both change over time. The influence of L1 on the perception and production of L2 categories are well-known; that L2 can affect the phonetics and phonology

of the L1 is less obvious (Cutler 2012). But in fact various studies have shown effects on L1. Processes can be lost where there is no high functional load; Watson (1989: 59) notes that Scots Gaelic speakers often lost initial mutation when its appearance is predictable following particular particles. More subtle differences relate to phonetic realisations such as voice onset time (VOT). Bilinguals in two languages which differ in how stops are realised (voicing and aspiration) may show differences from monolinguals in the VOT for the stops in their L1. A small study (Flege 1987) compared 42 women: monolingual French, monolingual American English, three groups of American English learners of French with different degrees of proficiency, and one high proficiency group of French learners matching the highest proficiency of American English learners of French. Flege found that the production of word-initial /t/ in comparable English and French words varied between the monolingual speakers and the proficient bilingual speakers. While VOT for initial /t/ diverged substantially between the monolingual speakers of English (mean 77ms) and the monolingual speakers of French (mean 33ms), proficient French learners of English and English learners of French showed little divergence in their VOT for both languages, and substantial differences with the monolingual speakers.

	English 'two'	French 'tous'
monolingual French speaker		33 ms
monolingual English speaker	77 ms	
proficient French learner of English	49 ms	51 ms
proficient English learner of French	49 ms	43 ms

Shifting of sound systems is illustrated in Bullock and Gerfen's discussion of French in the United States. They show that in 2002 two of the last native speakers of French in Frenchville, Pennsylvania had merged the two mid front round vowels of French [œ] [ø] and replaced them with an American English-like rhoticised schwa, whereas older native speakers recorded in the same town in 1973 did not use rhoticised schwas in their French (Bullock and Gerfen 2004). They argue that the two mid front round vowels are allophonic variants in standard French, and that replacing them with the rhoticised schwa is a case of making them more similar to their English vowel system. They observe that both round front vowels and rhoticised schwa are marked. The change is not one of simplification through reduction of markedness, because, while there is simplification through loss of an allophonic alternation, the marked high front round vowel [y] is retained, and the mid front round vowels are replaced by the rhoticised schwa, a sound which is cross-linguistically rare.

Another example of shift comes from stop consonants in some Australian Indigenous languages. Most Australian Indigenous languages usually have only one series of stop consonants; they lack the voicing/aspiration contrast of Australian English. The phonetic realisation depends on where the stops occur in a word and to some extent on the place of articulation, but commonly they are realised as phonetically voiceless and unaspirated. However, it is common for terminal speakers and rememberers to perceive these as voiced. For example, the southern Australian language Barngarla was recorded a couple of years after first contact by a German missionary (Schürmann 1844), who wrote most stops as voiceless (so that the name of the language was *Parnkalla*, and the word for 'head' was written as *kakka*). In 1994 when I took part in a language revival workshop with Barngarla people, at a time when a few people remembered a few words, they were adamant that these

should be written with voiced stops, writing the name of the language as *Barngarla*, and the word for 'head' as *gugga*. Their neighbours to the east and west showed a similar preference for voiced stops. Thus a Kokatha woman (Kokatha is a western neighbour of Barngarla) has recently published 170 words used by her mother (Coleman 2012), which include what she writes as *gugga* 'head'. In her spelling of these words there are 172 voiced stop letters and 32 voiceless stop letters. The voiceless stops are found mostly for laminal stops ('th' in *tharldubula*, 'true as true') or in English loanwords ('t' in *rabbity* 'rabbit'), and the seven changes in voicing in loanwords are all changes from voiceless to voiced (e.g. *boonie* 'horse', *biggy* 'pig'), suggesting that they hear the consonants of the traditional language as more similar to English voiced stops. In similar language revival contexts around the same time, Doris and Cecil Graham remembered Narrunga words (Narrunga is to the east of Barngarla), and wrote them mostly with voiced stops initially, and some voiceless stops medially, e.g. *gucka* 'head', but again using 'th' for lamino-dentals.

6.3 Morphosyntax

The morphosyntax of the first language of adults who switch to speaking another language may also be subject to change (Pavlenko 2000; Mougeon and Nadasdi 1978), although this seems less common than changes in phonetics/phonology and lexicon (for example, a preliminary study of English speakers of Turkish showed little evidence of L1 syntactic attrition [Gürel 2007]).

Maher (1991) summarises data from enclave speech communities, both immigrant and autochthonous, showing changes in the forms and uses of morphological systems of languages (Finnish: American English; Scots Gaelic: English; Bhojpuri and Trinidad Hindi: English; Bhojpuri: Mauritian French creole). All but two of her examples come from morphologically richer languages coming into contact with morphologically poorer languages such as English and creoles. She notes that the changes are more often examples of loss or restructuring. Typical patterns she notes include the reduction in use of inflectional morphemes on words, reductions in the forms of morphemes (loss of allomorphy and regularisation of paradigms), and reductions in concord of inflections. All these changes relate to Lleó and Cortés' linguistic factors of 'complexity' and 'uniformity'. Maher suggests that these changes result from incomplete learning of the minority language by children due to reduced exposure, once their parents, grandparents and older children in the speech community have moved to talking another language more of the time. However, all these changes can be seen in other situations, in the development of creoles for example, and so incomplete acquisition cannot be the whole answer to the question of why these changes occur. Finally, the loss of inflectional morphology can have concomitant effects in the syntax; for example, loss of an ergative marker may relate to greater use of word order to indicate subject functions (O'Shannessy 2006). Such changes may have the effect of adding complexity in another area of the grammar.

More purely syntactic changes occur, such as ways of marking subordination. Tsitsipis (1989) notes the almost systematic replacement of a subordination marker by a future marker among Arvanitika terminal speakers in Modern Greece. Bowden notes among Taba speakers (an indigenous group in the North Maluku province of Indonesia) an early borrowing of Malay *jadi* 'become, thus' as *dadi* 'so', as well as borrowings from Malay of a relativiser *yang* and the conjunction *karna* 'because' (itself borrowed into Malay much earlier from Sanskrit). These, according to Bowden, are cases of borrowing words for which there are no one-word translation equivalents in Taba (Bowden 2002: 126–129). Bowden notes also that this allowed a reordering of clauses to result-cause, not otherwise available in Taba grammar,

and he argues that this is an example of 'metatypic remodelling' (the "diachronic process in which the syntactic system of one of a bilingual community's languages is restructured so that it more closely resembles the syntax of its speakers' other language" [Ross 2007: 116]), which approximates Pavlenko's shift. Something similar is seen in Warumungu, where a creole form *pju* (< English 'suppose') has come into Warumungu meaning 'if', as a substitute for expressing conditionals by inflections on verbs.

Word order changes provide other examples of shift. The Azeri of younger bilingual speakers of Azeri and Persian living in Tabriz, Iran, showed a shift from right-headed noun phrases to left-headed noun phrases. Erfani (2013) argues that this change occurs under the influence of Persian which has left-headed noun phrases.

(2) Younger speaker

müdir-i *mädräsä*

director-EZ school

'the school director' (EZ is said to be a suffix borrowed from Persian)

(3) Alternative form

mädräsä *müdir-i*

school director-LNK

'the school director' (LNK is described as a grammatical linker)

(Erfani 2013: 60)

However, the fact that older monolingual speakers of Azeri also used left-headed noun phrases (albeit to a lesser extent) means that further work is needed to ascertain whether bilingualism in Persian is causing the change, or hastening an existing change that was already in progress.

Word order as it relates to information structure provides examples of change whose sources are similarly indeterminate. Tsimpli (2007) compared 19 L1 speakers of Greek living in England with a control group of 20 speakers living in Greece and with no or minimal exposure to English. The speakers who had considerable exposure to English produced more preverbal subjects in contexts of new information than the control group. The latter used some preverbal subjects, but used more postverbal subjects in the same contexts. The increase in preverbal subjects in this new information context could be seen as an extension of an existing L1 possibility which happened to resemble the normal practice of English, the L2 in this case (Tsimpli 2007). Word order shifts to less flexible orders more closely resemble English are also found in the Australian languages Gurindji Kriol, Light Warlpiri and New Lardil. For the latter Richards (2001: 441) notes that the dominance of SVO order in New Lardil (94 per cent) reflects the fact that it was the most common order in Old Lardil (38 per cent, the next most common being 20 per cent).

6.4 Ways of talking

The formal characteristics of some ways of talking may have no obvious correspondents in the ways of talking of another language, and so are likely to be lost when language shift takes place. An example is affective affixes in Cup'ik (Central Alaska) which differ formally from English in occurring as suffixes on both nouns and verbs. They are linked to other ways of expressing feelings, and are used intensively in narratives in a way which, if translated into English, seems 'too wordy', 'too cute', or 'too sharply evaluative'

(Woodbury 1998: 256). Woodbury predicts that the loss of this aesthetic tradition would be a consequence of radical language shift from Cup'ik, because it would be difficult to transplant into English.

The retreat of languages in particular domains and registers may lead also to losses of particular structural features or terminology systems. Bowden (2002) connects the loss of the *alus* 'refined' forms of a three way speech level system by younger Taba speakers with a decline in the use of Taba language generally in formal speeches made on ceremonial occasions.

7 Conclusion

For historical linguistics, the question arises as to the place of languages which have undergone attrition. A common end-state of language attrition is disappearance of the old language as people shift to speaking another language. But the shift could be halted. This may happen because of a sudden reduction in the intensity of contact and the influence of the other language, as when colonisers are expelled or their contact with their original homeland wanes, and the language of government and trade in their new country changes back to the language of the colonised, albeit with much loss accompanied by convergence, borrowing, shift and restructuring from the colonisers' language. Something like this may have happened to English in the period between the dominance of French and Latin as languages of power immediately after the Norman conquest, and the mid-fourteenth century when Edward III's government gave official recognition to English in the 1362 Statute of Pleading requiring English to be spoken in law courts (Ormrod 2003).

In these cases the historical linguist will have conflicting evidence for determining the genetic status of the language that has undergone massive change (Thomason and Kaufman 1988). While it is clear that the extent of L2 effects on L1 varies across all areas of the grammar, we do not yet have clear ways of deciding which changes are due to loss, borrowing, shift, restructuring and convergence under intense contact, and which are internal changes accelerated through intense contact. Much more work is needed to discern the variation of ways of talking which occurs during times of rapid change. This will allow better understanding of the input to language learners, and thus of the materials that they are using to form the grammars of new ways of talking.

Notes

- 1 I am grateful to Claire Bowern and Bethwyn Evans for many helpful editorial comments. Any remaining mistakes are mine.
- 2 As Clyne (2011) shows, immigrant communities vary as to how many generations continue to speak the heritage language in some form.

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Part IV

Interfaces