

1988; Seifart, 2012; and many of the contributions to Hieda, König and Nakagawa, 2011, among many others). It would also be possible to do simulation-based studies,² or broad-scale quantitative studies that compare contact patterns between related and unrelated languages across the world. However, the sample size needed for such a study is formidable and at this stage infeasible to produce, given how time-consuming it is to identify loans systematically.³

Here I follow a third approach, by generalizing across case studies and looking at the question of contact between related languages from a theoretical standpoint.⁴ That is, given what we know about language change, what generalizations can be brought to bear on the problem of disentangling shared inheritance from contact-induced change amongst related languages? What cases are likely to remain unsolvable, and where have we made progress? In what follows, I examine several different ideas regarding the nature of language contact and change as it applies to related and unrelated languages. I take as a starting point the positional questions posed by Epps et al. (this volume) regarding the types of problems which are unique to dealing with contact among related languages, the implications of contact effects for reconstruction, and criteria for diagnosing contact effects. They note that previous studies on language contact have played down the possibility of differences between outcomes of contact between genetically related and unrelated languages. However, undiagnosed contact may lead to erroneous language classification, and longstanding contact may lead to shared areal features, and this may pose problems for the identification of the sources and paths of innovation.

I suggest that contact among genetically related languages has been problematized by correlations between factors such as phylogenetic closeness, geographic proximity, and structural similarity. I show that there are reasons that genetically related languages may show elevated levels of language contact that have nothing to do with the degree of language relationship *per se*; degree of relationship is epiphenomenal. I also discuss social models of language contact, particularly Thomason and Kaufman (1988), and show that social factors are relevant because of the processes which lead to language split.

² Greenhill et al (2009) uses simulation modeling to determine how much borrowing is necessary before a family tree becomes unrecoverable. Kandler (2009) and Kandler et al. (2010) simulate population dynamics of language shift.

³ Work by Matras and Sakel (2007a), however, is a step in this direction.

⁴ For a similar approach to the concept of linguistic areas, see Matras (2011); see Muysken (2000) for a similar approach to code-mixing.

Social factors, I argue, trump language relatedness, but those same social factors also affect language splitting.⁵

One way to examine this question would be to concentrate on ‘language contact’ as what happens in the mind of the bilingual individual who introduces features from one language to another. Such an approach would be to localize the question of whether relatedness matters to the mind of an individual. However, such an approach is difficult when generalizing from the behavior of individuals to the results of contact as seen in language history. My focus here is on studying the results of contact in the linguistic record.

2. Contact and Phylogenetics

2.1. *Is All Language Change ‘Contact’?*

At a superficial level, language ‘contact’ is not only clearly facilitated by a close genetic relationship between the languages; it is part of the definition of language change. Such a view is required by any theory of language change which recognizes that innovations occur in individuals but are introduced and are spread through speech communities by both adults and children (cf. Labov, 2001, 2007; Aitchison, 2008, amongst many others). That is, there are changes which diffuse through communities of speakers through speakers’ interaction (i.e., their ‘contact’) with one another. However, linguists also recognize that there is a difference between the types of changes that occur within a language (that is, anagenetically) and those that occur through contact between different languages. For example, basic vocabulary items are less likely to be loaned than they are to change through language-internal means (Haspelmath and Tadmor, 2009: 65–68).

This view—that all change is ‘contact-induced’ in that it involves speakers with different idiolects interacting with (that is, *in contact with*) each other—is most closely associated with Mufwene (2001) (though for earlier statements of similar views see Bailey, 1973; see also Karam, 2000 and Croft, 2008). We can observe that most linguistic changes spread easily through speech

⁵ The term ‘language contact’ is perhaps a misnomer, since for the vast majority of human history it is, of course, *speakers* that are in contact with one other rather than languages, and the transfer of linguistic material is the result of speaker behavior rather than something that languages do. This point originates with Milroy (1992: 199) (see also Milroy and Milroy 1985) and is worth reiterating here. It is therefore tempting to look for ways in which behavioral patterns may be systematically reflected in language contact outcomes. There has, however, been considerable resistance to this idea.

communities, less easily (but still fairly easily) across dialect boundaries where speakers are in contact with one another, and less easily still across language boundaries. That is, at some point there is sufficient change between two varieties to impede communication between the groups, and speakers no longer participate in each other's changes. Evidence comes from the bunching of isoglosses (Campbell, Kaufman, and Smith-Stark, 1986; Hock, 1991; Masica, 2005, and others) and from our ability to separate contact-induced changes from innovations within a speech community, both quantitatively and qualitatively.

Mufwene's model of language ecology is grounded in the idea that the social processes which give rise to creoles are no different from the social processes which give rise to other types of language change. Under this position, the amount of material transferred is a function of the intensity and type of sociolinguistic interaction. The mechanism by which the innovation is introduced to and spread through individuals in the speech community, however, is the same. Although the model might be controversial, the facts about speech communities described above are well established.⁶ It might therefore be thought that the idea would 'scale up'; that is, that the arguments applying to languages and dialects might also apply, *mutatis mutandis*, to subgroups and families. After all, language subgroups and families have their origins in languages and dialects, and it would not be surprising if the relics of diffusion patterning were visible in the reconstruction record at greater time depth.⁷ Under such an assumption, the degree of shared innovations and the permeability of linguistic boundaries would reduce to the degree of contact that speakers have with each other. That is, speakers typically have close contact with other members of their speech community, more distant contact with other dialect speakers, and only casual and infrequent contact with speakers of other languages. The degree of change would not be determined by linguistic boundaries *per se*, but rather by the amount of contact that speakers can easily have with one another. Authors such as Matras (2007: 31), indeed, have called such a link "obvious".

It is possible to demonstrate empirically, however, that this cline of contact and accommodation does not 'scale up' to subgroups and families, and that

⁶ Controversies about this model stem in part from how structurally exceptional creole languages are and how common are their circumstances of formation. For recent debate on this issue on both sides, see Bakker et al. (2011), McWhorter (1998), DeGraff (2003) and Bickerton (2004). The most controversial parts of the theory relate to how it places creoles in a general typology of language formation; the parts of the theory that relate to how non-creole languages are transmitted has received less attention.

⁷ This view is implicit in Schmidt's (1872) wave model.

both contact and change are sensitive to linguistic boundaries. That is, there is no single diffusability cline where languages become progressively and clinally more different from one another as they become more distantly related. Such a cline would be expected if the degree of difference is the main determinant of the diffusability of changes. The evidence that change does not spread irrespective of the type of boundary comes from data in Wichmann's (2010) study of Uto-Aztecan and has been replicated for the Pama-Nyungan family using similar data.

Wichmann plotted measures of language difference across the Uto-Aztecan family. In this case, the measure of difference is percentage of shared vocabulary between each possible pair of languages in the family. Figure 1 shows the frequency of each percentage. If language change (contact-induced or otherwise) were insensitive to linguistic boundaries, we would expect a linear distribution of frequencies, and presumably we would expect the distribution of distance frequencies to be roughly equal across language pairs. However, this is not what we find. Instead, there are two troughs in the distribution. The first occurs around 40% difference, while the second occurs around 80% difference. Wichmann provides evidence that the first trough occurs at the boundary between languages and dialects, while the second occurs at the boundary

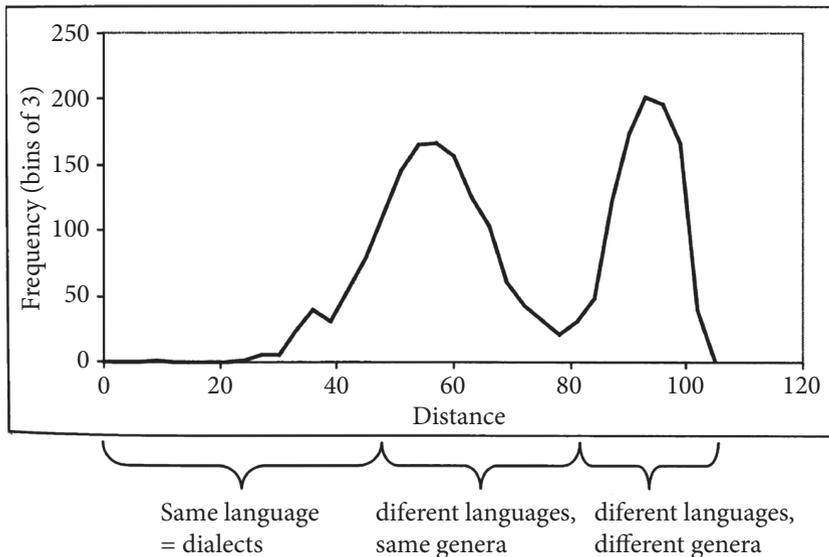


Figure 1. Frequency plot of distances of pairs of Uto-Aztecan languages, from Wichmann (2010).

of subgroups. The same distribution (that is, a two-troughed frequency distribution) is found with Pama-Nyungan languages.⁸

Thus the pattern emerging from these data is that sociolects and dialects show one set of facts (as reported in the sociolinguistic literature), while those patterns are not replicated by languages and across subgroups. That is, there is a continuous gradation of difference between dialects of a language but this does not extend to differences between either languages or subgroups of a family. There are several reasons why this result might obtain. There might be both qualitative or quantitative differences in speaker interactions at the dialect level versus the language level. In the absence of community-wide multilingualism, dialect contact and language contact happen with different numbers of community members (that is, one might assume that there would be fewer bilingual individuals than bi-dialectal individuals). Dialect transfer within an individual bilingual speaker might involve different processes from language transfer (see further Matras, 2010 for exploration of this point).

This further provides evidence that we should not generalize from contact and transmission within a speech community (and between speech communities speaking related languages) to more remote relationships. While Wichmann's data supports the social/contact model between speakers of the same language, it also implies that the social processes that lead to contact between speakers of different languages are not of the same type. That is, boundary formation leads to other processes which destroy the diffusability cline.

2.2. *Phylogeny and Dependent Factors*

We have shown that closeness of speech community does not directly translate to ease of transfer of features beyond the language/dialect level. When we examine phylogenetic closeness itself, it becomes apparent that degree of closeness between two languages in a family tree is not independent of other factors that may themselves be responsible for facilitating contact. That is, there is a relationship between the processes responsible for phylogenetic splitting or change within a language, and those responsible for language contact. This is particularly relevant for Epps et al.'s (this volume) concern about the lack of

⁸ Distances were calculated using a neighbor-joining tree of the 194 Pama-Nyungan languages used in Bower and Atkinson (2012), based on lexical cognate data. Wichmann's *genera* follows Dryer's (1989: 267) use of the term, where they are defined as "*genetic groups roughly comparable to the subfamilies of Indo-European, like Germanic and Romance.*" Wichmann's similarity metric is based on a modified Levenshtein distance; the modifications result in percentages above 100%.

attention paid to the role of genetic relationship in language contact. To take one example, Matras' (2007: 34) typology of explanations for borrowing include the claims that the degree of borrowing is related to the intensity of exposure to the contact language, and that the outcome of language contact is a product of structural congruence among the relevant languages. Such problems become relevant when trying to determine the role of genetic relationship in language contact.

There are several problems of this type. One involves the relationship between structural similarity and closeness of relationship. Some authors have identified structural compatibility as being more important in the transfer of linguistic features in language contact than phylogenetic relatedness. See amongst others Meillet (1921: 87), Weinreich (1979) and Moravcsik (1975) for this argument, and Thomason and Kaufman (1988: Ch. 2) for some discussion of the principles. It is still treated as a tendency in the literature (e.g. Haig, 2001), even though Thomason and Kaufman (1988) provided evidence that structural similarity alone does not determine the degree of transfer of material in language contact.⁹

Now, languages that are phylogenetically close also tend to be structurally more similar to one another than to less closely related languages. This is because the more closely related languages are, the less time there has been for the languages to accrue differences since their most recent common ancestor.¹⁰ Because of the co-dependency between structural similarity and phylogenetic distance, we cannot be sure that phylogenetic closeness—rather than structural similarity—is the cause of greater language contact. The test cases would be for broad-scale tests of language contact and transfer of features that controlled for both phylogenetic distance and linguistic similarity; it is doubtful, however, that there are sufficient well-described studies in the literature to conduct such a test.

An additional confound for structural similarity and relatedness is that related languages are more likely to express cognate constructions through

⁹ As an anonymous referee pointed out, claims of typological similarity as a facilitator of borrowing are most relevant when they occur as explanations for violations of borrowability hierarchies. Thomason and Kaufman (1988: 14–20) show that structural similarity is not a prerequisite for transfer of material in contact, as had been earlier assumed. This is not the same thing as arguing that contact is facilitated by structural compatibility, of course. They also review some variants of the structural similarity proposal, such as Jakobson's (1962: 241) assertion that languages only borrow material that has structural analogues in the recipient language.

¹⁰ This is not the same thing as saying that all languages change at the same rate. There are, of course, counterexamples to this tendency, where one language has undergone sufficient change that it appears to be rather different from its closest relatives. However, such counterexamples are rare compared to general patterns of change.

cognate lexical and grammatical material. (Indeed, the presence of cognate lexical or grammatical material is one of the main arguments for cognacy in such constructions; see Harris, 2008.) It is possible that speakers might more easily adopt new syntactic features on items which are cognate to items already in their language, by a process parallel to the semantic extension of words which are cognate but which have distinct (though related) meanings in different languages. This has not, however, been tested empirically to my knowledge. Moreover, there are numerous examples in the literature of structural borrowing from unrelated languages (see, for example, Matras and Sakel, 2007b),¹¹ contradicting claims by King (2000), Longobardi (2001), Crisma and Longobardi (2009), and others, that structural features are only borrowed when lexical items are borrowed with their associated syntactic features. Given the prevalence of Pattern borrowing (in Matras and Sakel's terms) without the borrowing of associated lexical material, it would seem that genetic relatedness is unlikely to be overly important.¹²

Secondly, the degree of structural integration of items has been claimed to be a defining factor in the likelihood of language contact (Weinreich, 1979). That is, the more integrated a lexical or grammatical item is into the syntax of the language, the less likely it is that it will be borrowed. This appears to be well established both in the literature on language contact and through case studies.¹³ A corollary of this fact, however, is that languages with similar typological profiles with relatively unintegrated lexical items might be expected to show less resistance to language contact. This implies that structural similarity in general does not facilitate language contact; it is only a particular type of structure that facilitates it. While this has not, to my knowledge, been tested empirically, it is notable that the languages where structural similarity has not led to transfer of features are often languages with high degrees of morphological complexity.

Thirdly, structural similarity might be the *result* of contact, rather than its facilitator. The presence of linguistic areas, where unrelated languages acquire

¹¹ One might also note that pattern borrowing without lexical borrowing is probably easier to identify than grammatical borrowing with lexical material when related languages are involved, simply because the presence of identical functions with unrelated forms provides evidence of innovation.

¹² Form/function similarity may be important for borrowings introduced to languages via code-switching among bilingual individuals (see, for example, Matras, 2010), but this is not the only way that loans are introduced (Muysken, 2000).

¹³ Thomason and Kaufman (1988) provide references and examples. I take 'structural integration' to refer informally both to the degree of morphological integration of morphemes in the language (bound vs free, etc) and to notions of obligatoriness (cf. Gardani's (2008) distinction between contextual and inherent inflectional morphology).

convergent features, shows that this can happen (Matras, 2011; Campbell, Kaufman and Smith-Stark, 1986). Another case where structural similarity is the result of contact is metatypy (Ross, 1997), where one language undergoes substantial grammatical restructuring so as to resemble the donor language. Ross (1997) provides examples from Takia and Waskia, and Gumperz and Wilson (1971) give examples from Kannada, Urdu, and Marathi convergence in Kupwar village. Now, both Gumperz and Wilson's and Ross' examples involve unrelated languages which can be shown to have become much more similar to one another, and comparison with varieties outside the contact zone allows us to show that convergence is the result of contact and not the cause.

Often, however, unless we are lucky enough to observe a change in progress, the historical record does not allow us to tell whether two languages have converged in structure, or whether their structural similarity has allowed greater contact to take place. McConvell and Bower (2011), in reconstructing coverb borrowing in the Kimberley and Victoria River Districts of Northern Australia, found a dependency between the degree of structural integration in the language and the amount of borrowing, rather than structural similarity between languages *per se*. This corroborates Weinreich's finding discussed above. However, in the languages with the strongest evidence for extensive contact, the contact and amount of coverb borrowing had led to restructuring the coverb systems and made the languages typologically more similar than they had previously been. That is, we cannot argue that structural similarity facilitated contact, or that contact was facilitated by the relative 'looseness' of the construction under investigation, because the evidence shows that contact caused structural convergence towards a less integrated construction.

2.3. *Degree of Contact*

Thomason and Kaufman (1988: 50) have argued that the degree of speaker contact is the best predictor for the spread of features between languages, and that the type of contact is a predictor of the extent of the spread.¹⁴ In casual contact with little bilingualism between the language groups, we can expect to see only lexical borrowing in non-basic vocabulary domains.¹⁵ Intense contact

¹⁴ Thomason and Kaufman also distinguish two outcomes of contact-induced language change: language maintenance with borrowing, and language shift. This distinction is not relevant for the discussion here.

¹⁵ Bower et al. (2011) show that intensive language contact is a necessary, but not a sufficient, condition for borrowing in basic vocabulary. This model is agnostic on the proportion of a population required to be bilingual in order to facilitate extensive contact-induced change.

over a sustained period is required for structural borrowing to occur, though it should be noted that sustained interaction does not necessarily lead to extensive contact-induced change.

However, the degree of contact between two groups might not be independent of phylogenetic distance either. Because of the way in which languages split, their geographic nearest neighbors tend also to be close neighbors phylogenetically (see, for example, Haynie, 2012; Reesink, Singer and Dunn, 2009). That is, there is typically a correlation between phylogenetic distance and geographic distance between pairs of languages. Therefore, the languages most available for contact also tend to be phylogenetically close.¹⁶ If we thus count the number of items that have been borrowed between related and unrelated languages, we would expect borrowings between related languages to predominate.

A further confound involves the potentially different situations that lead to speakers of related and unrelated languages coming into contact. It remains to be seen whether the social processes that give rise to contact between unrelated languages are equivalent to those between related languages. For example, situations where unrelated languages come into contact with one another may reflect migration and colonization processes that are rare in the contact situations where the languages have diverged *in situ*. A major source of current language contact involves colonial languages such as English, Spanish, French, and Portuguese interacting with indigenous languages. This is an important confound for the argument that contact-induced change appears to be less frequent amongst related languages simply because it is more difficult to identify. Rather, it is possible that the social conditions which give rise to contact induced change appear more frequently when the contact is between distantly related or unrelated languages.¹⁷

There are other reasons why we might expect language contact rates to be higher between related languages. Related languages might be in contact more frequently because it is easier for speakers to acquire fluency in languages that

¹⁶ Many of these points are made independently by Jordan and Shennan (2003) in the context of using linguistic groups to track the horizontal versus vertical transmission of cultural innovations. A referee points out that a major source of language contact is between colonial languages and indigenous languages. However, while this may now account for many cases of language contact, this would not have been the predominant contact situation in either precolonial times or further back in prehistory.

¹⁷ This is related to the question of how (and whether) languages diverge while their populations remain in contact with one another. The biological speciation literature (such as Coyne and Orr, 2004) shows that biological species usually do not split under such circumstances unless there is a *de facto* barrier, such as niche specialization. I tentatively assume that isolation is also required for linguistic language split, though this isolation may be either geographic or social.

are more similar to their own native language. This might in turn bias speakers to associate more with those groups, leading again to more intensive contact.

In summary, contact-induced change between related languages might be higher than between unrelated languages because the ease of contact is greater. Alternatively, contact between unrelated languages might be higher than between related languages because of the social processes that led to the languages coming into contact with one another.

3. Causes of Change

The previous sections have been concerned with the problems of isolating the structural correlations between contact and relatedness. Further problems arise from the identification of causes of language change; that is, whether a change has been triggered by language contact, or whether it is the result of internal processes within the language. Arguments about the causes of change (whether internal or external/contact-based) often rely ultimately on arguments from plausibility (Vossen, 2011: 191 is an example).¹⁸ Even when the change was very recent or where information about the change is copious, it can be very difficult to determine whether the reason for a given change was primarily contact, internal factors, or some combination of the two. This is because changes reflected in the linguistic record are not single events; rather, they are the result of broad patterns of shifts in behavior of speakers. For example, in considering the Norse influence on English in the 9th and 10th centuries, Thomason and Kaufman (1988: 276–280) point out that the Northern dialects of English show more morphological innovations (and are morphologically more simple) than the Southern English dialects, but that while this area is correlated with the social upheaval associated with the Danelaw, neither are the changes found throughout the Danelaw, and nor do the changes indicate convergence to Old Norse.¹⁹ Thus even though there is a plausible contact event that occurred at approximately the right time to have

¹⁸ Vossen (2011) argues for areal influence in the distribution of pharyngealized vowels in Khoe languages.

¹⁹ As a reviewer points out, the treatment of English as a contact variety is controversial. Burnley (1992) summarizes the complexity of the situation but argues that even in areas of heavy Scandinavian settlement, there is unlikely to have been extensive bilingualism. Burnley (1992: 420) suggests a model of casual partial bilingualism where speakers of the two languages would communicate by relexifying their native languages to accommodate to their interlocutor. Evidence for this, or for how this would lead to lasting changes in English, however, is not provided.

triggered the relevant innovations, the lack of convergence makes tying the changes directly to contact problematic.²⁰

Language contact can also accelerate changes that are incipient in the language. As Trudgill (2011) has shown, one clear result of language contact is that it speeds up change.²¹ Contact may thus facilitate the adoption of changes which are already in progress prior to the contact. Such a claim has been made for the loss of inflectional case marking in the history of English. As Haeberli (2004: 119) discusses, the case system had been eroding since the end of the Old English period, before the Norman invasion led to extensive contact with French. There is no information on what degree of contact is necessary for such changes to take place.

Another example comes from King's (2000) study of Prince Edward Island (PEI) French. She argues that despite extensive superficial similarities between PEI French and North American English, the case for direct contact-induced grammatical change is overstated; instead, she suggests that the syntactic changes are internal, but facilitated by lexical borrowing. In particular, she argues that although PEI French shows preposition stranding constructions that are similar to some English structures (as shown in 1), there are sufficient differences between PEI and English preposition stranding that it is unlikely that the syntactic construction was borrowed directly.

- (1) *Qui as-tu voté pour?*
 who have-you voted for?
 Who have you voted for? (King, 2000: 3)

A result of this is that arguments about degrees of contact often reduce to how willing a linguist is to entertain contact scenarios. It may come down to a tension between a view that similarities between two languages where speakers are known to be in contact are likely to be due to that contact, versus a more nuanced view where languages remain largely autonomous despite speaker interaction. In other cases it may come down to definitions; for example, King does not argue against contact in general just grammatical borrowing.

²⁰ We know that language contact does not always result in convergence, and there are numerous cases in the literature of contact producing new language varieties. For example, the Young People's Varieties found in Australia (see, for example, Lee, 1987; O'Shannessy, 2005; McConvell and Meakins, 2005) have features that are found in neither the Australian languages spoken by the older generations, nor in the English with which they are in contact.

²¹ This finding is also congruent with Atkinson et al.'s (2008) finding that the amount of change is greater on branches with more splitting events; in Austronesian, this is correlated with languages in contact.

That is, the conceptualization of language contact and the theory of its role in language formation can substantially influence views about the interpretation of any given case.

Because of this, we need to be careful of biasing our views towards the exotic end of language contact. Thomason and Kaufman's (1988) work argued against a view that treats some types of contact-induced change as impossible, and against any theoretical restrictions on linguistic domains where contact-induced change might apply. The evidence they bring to bear is compelling. However, it does not follow from this that just because anything *can* happen in language contact, that 'anything' frequently *does* happen.

The focus on the presence of contact-induced changes in some languages might lead one to believe that such changes are more common than they in fact are. We have seen this with the Australian focus on language contact, where the surveys (e.g. Dixon, 2002) establish a baseline for contact-induced change that is far in excess of the average for the continent as a whole (Bower et al., 2011; Bower, 2011). In short, extensive contact has been established in the literature on Australian languages on the basis of case studies such as Heath (1978) and Hercus (1987), and this has created the expectation that contact has profound effects on language change throughout the continent. In fact, contact-induced change does not appear to be that much more frequent in Australia overall than elsewhere. This should be expected, given that multilingualism amongst Aboriginal Australians was not at all uniform, ranging from monolingualism or only rare instances of multiple language learning, to asymmetric multilingualism (where speakers of one language would speak their neighbor's language, but not vice versa), to the community-wide full competence in multiple languages that is known from Heath's studies of Arnhem Land.

Such assumptions hold us back from progress in linguistic prehistory. It is important to recognize that in many places we can, in fact, differentiate contact-induced change from transmission changes; recognizing this does not tie us to an antiquated view of prehistory that relegates language contact to a minor role in the historical record; it allows us to make the optimal use of data from both types of change in order to discover the past.²²

²² Aikhenvald (2004: 222) suggests that the requisite work has only been done in four areas in the world: the Balkans, India, Northern Australia's Arnhem Land and Daly regions, and the Vaupés region of Amazonia. This seems to me to be needlessly pessimistic; considerably more areas of the world have been the subject of detailed historical work than this list implies.

4. Contact Features in Reconstruction

4.1. Identification of Contact Features

Because unrelated languages tend to be both lexically and structurally distinct, identifying features in common and designating them as contact-induced is usually straightforward if the time-depth of contact is shallow. Barring accidental similarities, the lexical items are either close to identical or completely different, and close to identical items are most likely to be loans. Thus Bardi (Bovern, 2012) *boolaway* ‘pull away’ is a likely loan from English, but *dirray* ‘turn around’ is not.

However, because related languages contain material inherited through common descent, the possibility exists that similarities will fail to be identified as due to contact. That is, there is a baseline of similarity that may cloud the identification of loanwords. Words can be identified as loans if they have failed to undergo characteristic sound changes (or if they show sound changes which are characteristic of another language; that is, if they are exceptions to sound change). For example, Bardi *wanggid* ‘crow’ is most likely a loan because other words that begin with *w in the ancestor language Proto-Nyulnyulan have lost this consonant; cf. *aamba* ‘man’ < *waamba, *ara* ‘other’ < *wara, etc. Loans can also be identified through the appearance of foreign morphology. For example, English *focus* is identifiable as a loan because its plural is *foci* and not *focuses*. Historical linguistic textbooks such as Hock and Joseph (1996) provide other suggestions for identifying loans. However, because closely related languages contain much more common material than distantly related one, the possibility exists that similarities due to contact will fail to be identified. That is, they will not exhibit any of the characteristic shapes that allow us to positively identify a word as an exception. Loans from Nyikina into Bardi, for example, are unidentifiable if they do not exhibit one of the eight or so sound changes that characterize either Nyikina or Bardi. No one has, to my knowledge, estimated for any given language how many words this might affect for any given language pair. The calculation will be different for each language pair because it is directly related to their shared history and the number of relevant diagnostic changes and how many words they affect in the lexicon.

There are, however, ways to minimize this problem. One is to exploit the fact that language contact has patterns. That is, because contact is a function of speaker interaction, we expect to see some systematicity in the contact patterns which should affect all forms regardless of whether they might show a change or not. That is, if we have no evidence for contact between languages from the forms that would be expected to show a change, there is no reason to

assume contact in only the forms that would not show it. In my example from Bardi and Nyikina above, since identifiable Nyikina loans into Bardi are confined to a few flora/fauna terms, it is unlikely that there are many other loans in the lexicon that happen to have escaped attention in other domains. Another clue to diagnosing contact comes from Wanderwörter: we should be suspicious of inheritance of similar words which are very widespread across an area, especially if they also show irregularities in correspondence. For example, Bardi and Nyikina share a word *baarni* ‘goanna’. Although there is no reason from sound correspondences to identify this word as a loan, its presence throughout the Nyulnyulan, Bunuban, and Worrorran families, as well as in Kimberley Pama-Nyungan languages, makes it a likely candidate for a Wanderwort.

Secondly, we can follow the lead of Alpher and Nash (1999) by studying the areal distribution of lexical forms. That is, rather than relying solely on sound change, we can also see which languages exhibit which lexical items and use that as evidence for prevailing contact patterns. This works even in the absence of identifying sound changes. For example, the Karnic language Pirriya has the form *djiloi* for ‘eye’, which is cognate not with the other Karnic words for eye (which are based on a stem *mil) but with innovative forms in the Maric languages to the northeast (Barrett, 2005). Cognates of *dhili ‘eye’ are otherwise confined to Maric. This lexical pattern strongly implies that the Pirriya form is a borrowing, even though there are no known sound changes (at this stage) which would provide evidence of loanhood.

Thirdly, we should note that the similarity of dialects has not prevented detailed work from being carried out on dialect contact, even with imperfect data from the historical record. For example, the records of Early English allow the identification of a number of dialects and the tracing of loans between them due to sound change. Dialect borrowing explains doublets in English such as *fat* and *vat*, as well as irregularities such as *fox* versus *vixen* with varying initial voicing. The words with an initial voiced segment come from a Southern English dialect, where such segments were regularly voiced.

A bigger problem for identifying contact stems from completed changes. The methods described above for identifying loans rely on there being a point of comparison that does not show the change. For example, varieties of German spoken in the USA can be shown to have been influenced by English because they show innovations that varieties of German spoken in Germany do not (Boas, 2009). Romanian can be shown to be a member of the Balkan Sprachbund because it shows changes in common with other Balkan languages that other Romance languages do not (Joseph, 1992; Tomić, 2006). In the absence of external comparanda, some contact-induced changes will be

indistinguishable from shared innovations. This problem is not unique to language contact, however. It is a problem with any investigation of the past, as historians of science such as Sober (1991: Ch. 1) have pointed out.

The very existence of a complex literature on contact effects which have been reconstructed using the comparative method shows us that there is a lot that can be done in situations of contact amongst related languages (see, for example, Hercus, 1987; Evans and Palmer, 2011; Cyffer and Ziegelmeyer, 2009). However, one area where contact between related languages may be difficult to diagnose in the historical record is the shift to a closely related language (or dialect) with resultant substrate effects. This would be ‘contact’ because of the presence of substrate effects (that is, it would not be a straightforward case of vertical transmission) but it would lack most of the telltale signs that would let us diagnose contact. McConvell (2010) provides an example of language shift and probably borrowing from substrates (and describes the problems of identifying such substrate influence when the substrate has not been documented).

4.2. *Language Contact and Subgrouping*

Does intensive language contact cause problems for subgrouping? In simulation work by Greenhill et al. (2009), it was found that lexical loan levels had to be substantially above those typically found in real data before they caused problems for recovering tree topologies when using Bayesian phylogenetic methods. This implies that comparative methods that use not only patterns of lexical replacement but also sound change, morphological, and syntactic data, should be robust to regular levels of language contact in most cases.

Nonetheless, there have been claims that some parts of the world show areas where subgrouping has been obscured due to intensive contact between related languages. The classification problems in one of these areas—Australia—have recently been shown to be tractable (Bovern, 2011; Bovern and Atkinson, 2012), though several subgroups, such as the Karnic group of Central Australia (Breen, 2007; Bovern, 2009) remain difficult to classify. Other areas, however, appear to show sufficient contact effects that their internal subgrouping remains intractable.

There are, however, situations where language divergence and contact may impede subgrouping. Note that ‘regular’ contact on the whole does not seem to cause problems for recovering language relationships once historical reconstruction has been done. As in other parts of this article, this is theoretical, but based on an attempt to generalize from existing case studies. I propose that there are three situations where language contact might become problematic

for subgrouping. The first is where two languages become isolated and distinct through sound changes which differentiate them, but speakers later come back into intensive contact so that the languages share features. Mithun provides an example in this volume. Another well-known case is Armenian, which has been heavily influenced by Iranian languages (Hübschmann, 1875; see also Lehmann, 1967: Ch 12) and which was initially subgrouped with Iranian before Hübschmann was able to show that it constituted its own branch of Indo-European. Cases like this are not usually problematic once the work is done because this type of contact shows the hallmarks of language contact asymmetries in semantic fields and loans can be identified through relative chronology (Vossen, 2011 provides a good example). Occasionally, the amount of language contact may be sufficiently great that there may be insufficient material to allow for conclusive subgrouping (such as in the case of Albanian within Indo-European, where loans from Greek, Romance, and Slavic languages have obscured subgrouping within the family).²³

The second case is where languages have gradually diverged *in situ* and non-overlapping isoglosses remain from the old dialect area. Such a situation was described in Bowern (2006; 1998) for the Karnic subgroup of Pama-Nyungan. In Karnic, some early changes place the Northern Karnic languages Pitta-Pitta and Wangkayutyuru in a subgroup with Arabana-Wangkangurru, while other changes group the languages with Central and Eastern Karnic. This situation is similar to that described by Ross' (1997) linkage model, which he characterizes as "*the (usually gradual) geographic spread of a group of speakers*"²⁴ (Ross, 1997: 212). In the Karnic case, the changes are old (that is, they can be shown through reconstruction to predate other changes which are subgroup defining). Networks of this type, however, are messy because of divergence processes; that is, it is not contact between related languages that directly produces ambiguities in discrete subgrouping, but rather conflicting language split. Another example of this type of subgrouping difficulty comes from the Polynesian subgroup of Austronesian; see Greenhill and Gray (2012: 530-531) and the references therein. While the status of Polynesian within the larger Austronesian family is uncontroversial, the internal subgrouping of Polynesian is far from agreed. The most plausible reason for this is that the formation of

²³ An anonymous referee points out that in addition to the extensive loans from surrounding languages in basic vocabulary, the retentions are mostly from Proto-Indo-European and are thus uninformative for subgrouping.

²⁴ Ross here is contrasting population fission, where one group splits into two, from cases where a single group expands its range but speakers remain in contact with one another. Ross's linkage model is said to apply, however, to speakers and speech communities, whereas the situation I describe for Karnic has languages as the terminal nodes of the tree.

the group is due to overlapping dialect chains which have subsequently diversified into mutually unintelligible languages. Geraghty (1983) sketches the same argument for the languages of Fiji. Old dialect chains can be distinguished from extensive post-break-up language contact by the type of shared material and by the relative chronology of the changes.

The third problematic case for subgrouping is extensive convergent parallel development. This may look like contact, or it may just be that the preconditions for the change existed in both languages. For example both Greek and Sanskrit show a type of aspiration dissimilation known as Grassmann's Law. Now, in the case of Greek and Sanskrit, there is no reason to assume that language contact was involved, and we know from relative chronology that the change was independent. The same change in two languages that are adjacent isn't any more likely to be due to language contact unless we also have evidence that speakers were in contact with one another. Because of the way that language change works, we might expect to see parallel development in related languages, simply because the same seeds of a change (the biases which lead speakers to change in particular directions) are present in both cases. Such change may, however, be vulnerable to contact, because the contact conditions are likely to reinforce the biases that are already present in the languages. Heine and Kuteva (2003) call this 'contact-induced grammaticalization'.

5. Conclusions

Thus in conclusion, there are several mutually dependent factors that may (or may not) facilitate contact-induced change. These are language relatedness, structural similarity between the languages, and the exposure of speakers to one another. Because of this, it is difficult to tease apart the contributions that each of these factors might have to facilitating change. It is also likely, of course, that such factors do not work independently.

Problematic as such cases are, I argue that we already have the methods to identify contact from inheritance. We can consider what is known about the overall contact patterns in the region, we can compare domains of vocabulary, and use the evidence from relative chronology to reconstruct the prehistory of the region. Crucial in such cases, however, is the consideration of reconstruction evidence from a range of languages, and not just the cases that are most interesting from the language contact perspective. Only then can we get an accurate idea of the scope of contact in language evolution as a whole.

Finally, should we treat contact between genetically related languages as a special type of contact? I would suggest that typologies of contact would be

better served if they paid attention to the type of speaker interaction that their models imply, rather than the type of language relationship. Contact is what speakers do, not what languages do. Whether one adopts an individual agentive model of contact such as van Coetsem's (1988; 2000), or a population level one such as Thomason and Kaufman (1988), social considerations constantly cross-cut relatedness typologies to the extent that we can likely factor out the language relationship altogether.

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