

Evolutionary dynamics of language: Insights from a diverse sample of sociolinguistic studies

John Mansfield, University of Zurich¹

Abstract

The evolutionary dynamics of language can be studied using phylogenetic modelling of changes over thousands of years, or by close observation of changes unfolding over a few decades at the community level. The phylogenetic approach uses data from hundreds of languages to make cross-linguistic generalisations, but when it comes to community-level studies, the sociolinguistic variationist method has until recently been hampered by very narrow language sampling. However this is now changing, with an increasing number of variationist studies published on diverse languages. In this paper I assemble a diverse sample of variationist studies encompassing 63 languages from 26 families, and review potential patterns regarding rates of change of linguistic features, and which features are associated with social categories or social identity signalling. These observations largely converge with results obtained from phylogenetic methods, suggesting that more systematic meta-analysis of diverse variationist studies will provide a new way to investigate the evolutionary dynamics of language.

1. Introduction

Linguistics has taken an evolutionary turn in the last two decades, with new methods and findings connecting the close study of languages with broader questions about language origins and its evolutionary dynamics. For example, evolutionary linguistics asks why there are so many distinct languages, and how they came to be so different from one another. One key to such questions is phylogenetic modelling of language families, which can estimate the rates at which linguistic features change, and whether some changes tend to enhance diversification among related languages. But understanding language evolution also requires us to zoom in and out between different spatiotemporal frames (Enfield 2014: 9). Alongside big-picture phylogenies spanning thousands of years, we also need to understand the socio-cultural processes by which innovations emerge and potentially spread through communities (Evans 2018; Roberts & Sneller 2020). The socio-cultural dynamics of language change has been studied in some detail since the 1960s, using variation within a community as a window into processes of change (Weinreich et al. 1968), but it is only more recently that this approach has begun to encompass a diverse range of languages and cultural settings. The ‘sociolinguistic typology’ movement recognises the need to integrate comparative linguistics with socio-cultural process (Trudgill 2011; Di Garbo et al. 2021). Trudgill characterises this subfield as investigating ‘whether, and to what extent, the typological characteristics of the world’s languages are influenced by social structure and social organization – by the sociolinguistic characteristics of the communities in which they are spoken’ (Trudgill 2017: 124). A growing number of variationist sociolinguistic studies now investigate diverse linguistic settings, and especially the type of small societies in which most humans have lived for most of our history.

In this article I propose new connections between diverse variationist research, and comparative research on the evolutionary dynamics of language. I assemble an informal sample of variationist studies encompassing 63 languages from 26 families, and report on potential patterns in this sample with respect to types of linguistic structure, rate of change,

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and association with social categories. These observations have implications for the role of soci-cultural dynamics in the evolution of linguistic diversity.

2. Evolutionary dynamics in comparative linguistics

Some comparative linguistic studies investigate the ‘evolutionary dynamics of language’ (Greenhill et al. 2017), that is to say, which linguistic structures change faster or slower, and under what conditions. Such studies usually estimate rates-of-change for types of linguistic features (e.g. constituent order, stop voicing), but some studies also investigate whether changes show a diversifying tendency, making related languages more different from one another than would be otherwise expected. Sometimes labelled ‘schismogenesis’ (after Bateson 1935), such changes are hypothesised to result from social groups using linguistic features to signal distinct group identities (e.g. Sorensen 1967; François 2011). When groups remain in contact, while also recognising each other as socially distinct, we might expect identity signalling to enhance the diversification of language varieties. But just as different linguistic structures may in general change faster or slower, different structures may also have more or less utility for social identity signalling (Errington 1985; Cheshire 1987; Labov 1993; Eckert 2019).

Following foundational work by Nichols (1992; 1995), several studies have used phylogenetic methods to investigate rates of change of linguistic features, also often referred to as ‘(in)stability’ of features. Such studies vary in their specific methods and datasets, though many have used phonological and grammatical features from the World Atlas of Language Structures (WALS: Dryer & Haspelmath 2013). A meta-analysis shows a promising degree of convergence between the results of these studies (Dediu & Cysouw 2013), for example finding slow change in some core inflectional features such as case marking and gender, as well as constituent order, but more rapid change in some phonological features such as consonant inventory size and consonant voicing, and in some pragmatically oriented grammatical features such as definite articles. An alternative method tests stability of linguistic features using a metric that takes into account both vertical inheritance and spatial diffusion (Kauhanen et al. 2021). This further generalises the question of stability in linguistic transmission processes, and its results substantially converge with the earlier work, for example finding rapid change in phonological and pragmatic features (e.g. front rounded vowels; definite articles), and slow change in constituent order (e.g. object-verb, numeral-noun). Individual features can also be grouped into nine categories defined by WALS (e.g. Phonology, Morphology, Word Order...), but differences of feature stability do not appear to generalise across these categories (Greenhill et al. 2010; Greenhill et al. 2017). However it remains possible that generalisations might hold over some alternative categorisation, especially one designed to capture differences of stability.

Some studies also measure stability of basic lexicon (changes of cognate sets), and compare this against structural features. An earlier study of Austronesian and Indo-European found no difference in rates of change between lexicon and structure (Greenhill et al. 2010), while a later study on Austronesian finds that most grammatical features change more rapidly than lexicon (Greenhill et al. 2017). This is somewhat surprising, since sociolinguists propose lexicon to be a prime domain for sociolinguistic differentiation (Durkin 2012), which might be expected to propel more rapid change.

A smaller set of studies investigate cross-linguistic evidence for schismogenetic change. Evans (2019) reviews examples from a wide range of languages, arguing that linguistic schismogenesis is more common than has been recognised. He presents some potential examples from the domains of morphology and syntax, but suggests that lexicon is likely the most frequent domain of schismogenesis, followed by phonetics. Turning to quantitative studies, phylogenetic reconstructions have been used to adduce evidence for

increased rates of change when phylogenies split, often called ‘punctuational bursts’, which can be interpreted as a schismogenetic effect. A study of Austronesian, Bantu and Indo-European phylogenies found a positive correlation between the number of splits a language has been through and its number of lexical changes from the family root (Atkinson et al. 2008). A later study replicated this result for Austronesian, and additionally found a smaller burst effect for some WALS grammatical features, including word order and the presence of some grammatical categories (Greenhill et al. 2017). However this study does not systematically analyse the schismogenetic utility of different types of grammatical structure. Further results can soon be expected in this area, as phylogenetic methods are now being extended to include punctuational bursts explicitly into computational models of language change (Douglas et al. 2024).

Using a very different method, a study of grammatical variables and dialect differentiation in 42 diverse languages finds that some types of variable are more likely distinguish dialects than others (Mansfield et al. 2023). The three types investigated are (1) form variables, in which distinct grammatical markers appear in the same linear position; (2) order variables, involving the same elements in different linear orders; and (3) omission variables, distinguished by the presence/absence of a grammatical marker.

(1) Kugu Nganhcara comitative (Smith & Johnson 2000: 393)

- | | |
|--------------------|---------------------|
| a. <i>thuli-ra</i> | b. <i>thuli-nta</i> |
| woomera-COM | woomera-COM |
| ‘with a woomera’ | |

(2) Komnzo adjectival attribution (Döhler 2018: 89)

- | | |
|----------------------|----------------------|
| a. <i>zagr karfo</i> | b. <i>karfo zagr</i> |
| distant village | village distant |
| ‘distant village’ | |

(3) Tundra Nenets comparison (Nikolaeva 2014: 174)

- | | | |
|--------------------------------------|------------------------|-------------------|
| <i>T'uku° pəni°</i> | <i>taki° pəne-xəd°</i> | <i>səwa(-rka)</i> |
| this coat | that coat.ABL | good(-COMP) |
| ‘This coat is better than that one.’ | | |

They find that grammatical form variables have a high probability of differentiating neighbouring dialects, but order and omission variables both have a much lower probability. This supports earlier proposals made in a case study of Vanuatu languages (François 2011), suggesting that the form of grammatical markers may, like lexical forms, have schismogenetic utility, but linear ordering has little schismogenetic utility.

In summary, evolutionary linguistic research has yielded a substantial body of evidence on differential rates of change among linguistic structures, though there is clearly much more to be done in this area. A few studies ask whether particular structures are involved in schismogenetic change, and these suggest that lexicon and the form of markers are more likely to be involved in schismogenesis than grammatical structures. In the following sections, I will discuss how these findings compare with results from a diverse sample of sociolinguistic variationist studies.

3. Diversity in variationist sociolinguistics

While the studies reviewed above scope over millennia, an alternative approach is to study specific linguistic changes as they unfold, often over a few decades. This is the domain of variationist sociolinguistics, which takes advantage of the fact that linguistic changes spread via intra- and inter-speaker variation, as ‘different ways of saying the same thing’ (Weinreich et al. 1968). The main limitation of this field, from the point of view of evolutionary linguistics, has been its limited scope in terms of language diversity. With its gravitational

centres in Britain and the United States, variationist sociolinguistics has been heavily focused on English and a few other European languages. For example in the decade to 2015, over half of the articles in *Language Variation and Change (LVC)* were on English alone, and 86% were on European languages (Stanford 2016). This limitation is not just about languages, but also about cultural contexts. Although variationism is deeply concerned with diversity in terms of gender, ethnicity and class, it has tended to focus on urban societies in a few wealthy nation states, while only occasionally venturing into the much wider range of sociolinguistic phenomena outside this context.

Fortunately, many variationists are well aware of this limitation, and the horizons of variationism are widening. There have been calls for a greater scope of diversity (Stanford 2016; Hildebrandt et al. 2017), and in 2015 the founding of a new journal, *Asia-Pacific Language Variation (APLV)*, promoting variationist research in an especially diverse region. These developments build on the earlier emergence of variationist research in non-European languages, such as Arabic (Royal 1985; Haeri 1994; Owens et al. 2013), Hebrew (Levon 2012; Gafter 2019), Mandarin (Zhang 2005), Cantonese (Zhang 2019), Japanese (Heffernan & Hiratuka 2018) and Indonesian (Gunarwan 1981; Abtahian et al. 2021). However the earlier studies were generally still on national languages with millions of speakers in urban settings. What has arisen more recently is a wave of research on ‘minority’ or ‘indigenous’ languages, that is to say, the majority of languages on earth, which also reflect the more diverse cultural settings humans inhabit outside of industrialised nation states. This is especially important if we hope to use variationist research as a window into broader patterns of language change.

The remainder of this article will give a taste of what is now available in diverse variationist research, and demonstrate the value of further expanding this field. I have assembled an informal sample of diverse variationism, including studies that approximate the following set of features: (a) quantify use of linguistic variants; (b) consider social factors of variation; (c) study a language that is not European, not Indo-European, and/or not a national language; (d) appear in a variationist journal. I constructed my sample by first going through content lists of *LVC* and *APLV* for the last two decades. I then used web searches and recommendations from colleagues to add some more studies, especially for under-represented regions. The resulting sample encompasses 63 languages from 26 families, including sign languages. Figure 1 illustrates the language family coverage, while the list of studies is provided as an Appendix. Clearly, this remains a tiny sample of the approximately 8000 languages and 250 language families in the world. Furthermore, the coverage of regions and families is biased towards the Asia-Pacific region (thanks to the existence of *APLV*), and a strong representation of sign languages, while the regions of Africa, the Americas and northern Eurasia are under-represented. Thus the sample is small, and unbalanced. However given the lack of comparative research in sociolinguistics, this sample nonetheless represents significant progress in the state of the art.

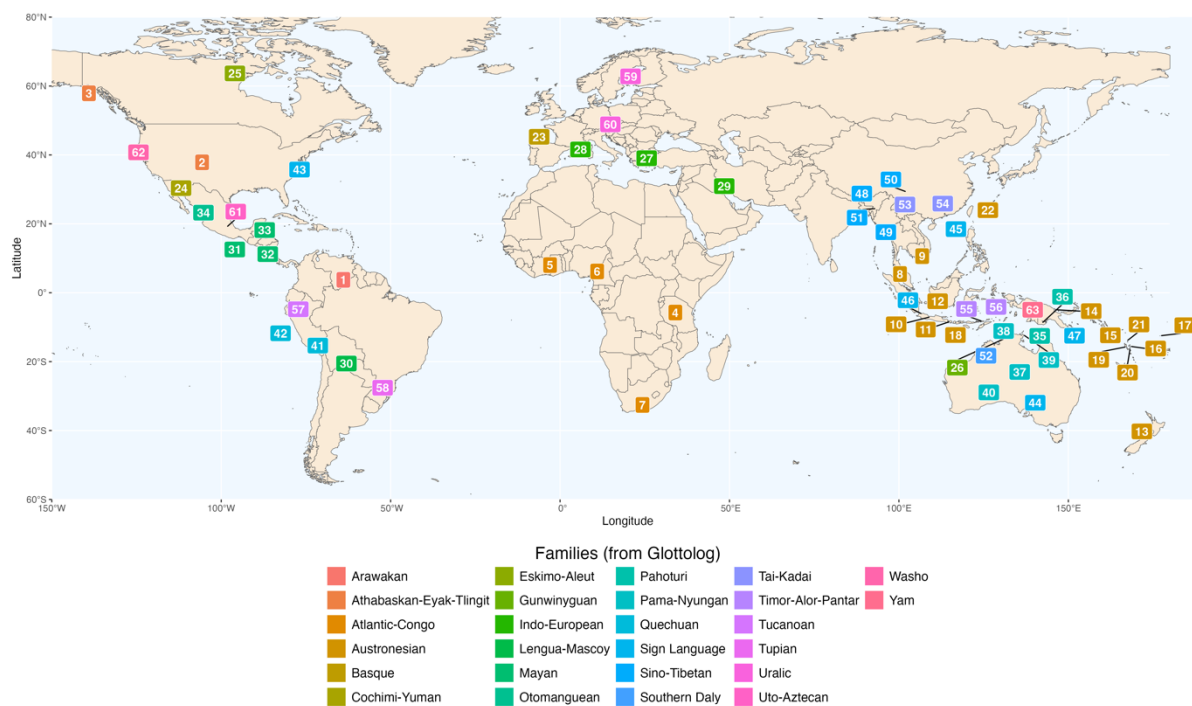


Figure 1. Language families included in a sample of diverse variationist studies. Numbers index specific languages, listed in the Appendix.

In the following sections I will consider how the sociolinguistic variables reported in these studies reflect on hypotheses about the evolutionary dynamics of language.

4. Implications of sociolinguistic variation for language evolution

Before diving into examples from diverse variationist studies, it is worth articulating some crucial parameters connecting linguistic variation, social structure and language change. Linguistic variables can in the first place be *correlated* with social categories (age, gender, prestige, etc), or they may vary without any such correlation. A secondary question, for variants with social correlations, is whether people have meta-linguistic awareness of the variation, and/or meta-linguistic associations between linguistic variants and social categories. The nexus of meta-linguistic awareness and social categories is too complex to do justice to here (but see Campbell-Kibler 2016; Drager & Kirtley 2016), but when speakers have meta-linguistic awareness of a variable, they may also associate it with social categories, i.e. ‘social indexicality’ (Eckert 2019 *inter alia*). Two key questions for socio-linguistic theory are, what types of linguistic structures are more likely to have social correlations, and what types are more likely to be socio-indexical. Both questions can only be approached satisfactorily by taking into account a diverse range of language types and cultural contexts (Labov 2015).

Social correlations and social indexicality both have implications for evolutionary dynamics. When a variable correlates with speaker age, this may indicate rapid change in progress, perhaps unfolding within a few decades (Bailey et al. 1991), though it may also be a youth variant that people grow out of. When a variable is socio-indexical, this implies the possibility of schismogenetic change, where social groups favour distinct variants as a means of signalling their distinct group identities.

Regarding different types of linguistic structure, some discussion has been framed in terms of phonology, morphology and syntax (e.g. Lavandera 1978; Cheshire 1987), but these categories are likely to be too coarse. The slightly more granular nine-category classification of WALS variables has also been used, as described above, but this categorisation was not

designed to reflect evolutionary dynamics. In the discussion below I will propose a different set of types, intended as a heuristic device for detecting patterns in the literature.

5. Patterns emerging from diverse variationist studies

I now consider some potential patterns emerging from the sample of diverse variationist studies, and how these might align with the dynamics of change and diversification described above. These should not be taken as strong claims, but rather as preliminary observations in a very new approach to evolutionary language dynamics. More robust generalisations will likely require a few hundred diverse variationist studies, rather than the few dozen consulted here. I begin with types of variation that appear to have the least connection to social categories, then move on to social correlations and finally social indexicality.

5.1. Grammaticalisation, redundant markers and mergers

The sample includes several instances where a grammatical category is variably expressed with a morphological construction, which can be interpreted as cases of grammaticalisation-in-progress. One example is in Matukar (Austronesian), where event directionality is variably expressed with a suffix-like construction (Davey & Barth 2024). The suffix-like forms transparently reflect phrasal serial verb constructions (4a), which have undergone phonological integration and sharing of pronominal prefixes to produce a complex word construction (4b). This innovation does not show strong social conditioning and speaker awareness is not reported. The suffix-like variant is more frequent with some main verbs than others, and with some directional markers than others. This appears to be a change-in-progress largely independent of social dynamics, spreading through the whole speech community under the influence of linguistic factors, and perhaps reiterating similar processes that have occurred in other Oceanic languages (Davey & Barth 2024: 180).

(4) Matukar

a. (serial verb construction)

...*ai luwadi-te diy-en di-mais-agokai*
tree middle-LOC 3PL.S-live 3PL.S-ascend-I.R.IPFV.HAB

‘They live up in the middle of the tree.’ (Davey & Barth 2024: 162)

b. (suffix construction)

...*bom main di-tarutiti-pid-din-e*
sago top 3PL.S-cut-down-3PL.P-D.SEQ

‘They cut down the sago...’

The Matukar example involves verb stems beginning to behave more like affixes. Other variables in the sample instead involve grammatical categories that can be redundantly marked. Such variables involve absence vs presence of a redundant grammatical marker, that is to say ‘omission variables’ (Mansfield et al. 2023). One example is in Paraguayan Guaraní (Tupian: Shain & Tonhauser 2010), where suffixal marking of direct objects has been innovated (5b), extending the use of a marker *-pe* that that was previously used only for recipients and locations (5a). This object marking remains variable, and is often redundant since the object role can be inferred from word order and/or context. The change has unfolded over a few centuries, and there is no mention of association with social categories. However it is likely to have been influenced by contact with Spanish, which has variable object marking favoured by animates. The Guaraní version is also favoured for animates, though it shows an additional preference for topical referents, which is not found in Spanish. Like with Matukar directional suffixes, the factors in conditioning Guaraní object affixation appear to be purely linguistic, rather than social.

(5) Guaraní

a. (traditional locative usage)

Che-váje-pe o-ĩ va'ekue peteĩ karai
B1.SG-town-PE A3-be back.then one gentleman
'In my town, there used to be a gentleman.'

b. (innovative object marking)

Kuehe a-hecha peteĩ kuñá-me
yesterday B1.SG-town one woman-PE
'Yesterday I saw a woman.' (Shain & Tonhauser 2010)

There are further examples of grammatical affixation developing seemingly without speaker awareness. Another omission variable is negative concord in K'ichee' Mayan, again potentially influenced by contact with Spanish (Romero 2015). A more complex example comes from Idi (Pahoturi), where a verb-final suffix *-n* can be used for both 1SG and 3SG subjects, and depends on conjugation class (Schokkin 2021). Although speakers are reported to be largely unaware of variation in this suffix, younger speakers use it more than older speakers, which could eventually point to its generalisation as a 1SG/3SG marker.

In other instances, redundant grammatical markers seem to be lost from a language, and changes in this direction can be rapid enough to generate age correlations over a few decades. For example in Oxchuc Tzeltal, progressive aspect is redundantly marked by two particles, of which the second can be omitted (Rocío Cruz Gómez 2008: 63). There is no mention of meta-linguistic awareness of this variation, but younger speakers omit the particle more frequently than older speakers, as much as 88% omission in casual speech (Rocío Cruz Gómez 2008: 118), which could foreshadow a relatively rapid loss of the marker. In another Oxchuc Tzeltal omission variable, noun classifiers can be omitted with non-human referents, when the lexical noun is present. This variable is reported to induce meta-linguistic awareness, with classifier omission considered to be incorrect speech (Rocío Cruz Gómez 2008: 66). While grammatical omission variables do not usually induce meta-linguistic awareness, perhaps noun classifiers are more salient to speakers, since they have relatively concrete meanings (Berlin & Romney 1964).

Grammatical markers can also be rapidly lost when mergers occur in inflectional paradigms. We find here another example involving noun classifiers, this time in Chichimec (Otomanguean), where four noun classes are marked on possessive pronouns: Food, Clothes, Animals, Other. Younger speakers largely collapse the Other class into the erstwhile Food class, creating a three-class system: Clothes, Animals, Other (Lastra 2009: 168). The merger is almost complete,² and has occurred rapidly over a few generations, though, there is no mention of meta-linguistic awareness. Another paradigmatic merger is Vatlongos (Austronesian), where subject prefixes traditionally distinguish singular, dual, paucal and plural number categories (Ridge 2022: 83). Table 1 shows some relevant forms for the immediate future tense. In the community of Mele Maat, which is closer to the urban centre than other Vatlongos communities and has more intensive contact with the lingua franca Bislama (Ridge 2022: 74), the paucal (PC) category appears to be merging in to the plural category. Again the change appears to occur rapidly and with no report of speaker awareness.

² Except for a few lexemes denoting saints and sacred items continue to be classed by younger speakers in the erstwhile Other class, which would make this a micro-class for Sacred referents.

Table 1. Vatlongos immediate future subject prefixes (Ridge 2022: 83).

	Traditional			Mele Maat		
	1	2	3	1	2	3
SG	<i>na-</i>	<i>o-</i>	<i>va-</i>	<i>na-</i>	<i>a-</i>	<i>va-</i>
DU	<i>malo-</i>	<i>mulo-</i>	<i>lalo-</i>	<i>malo-</i>	<i>mulo-</i>	<i>lalo-</i>
PC	<i>mato-</i>	<i>muto-</i>	<i>lato-</i>			
PL	<i>ma-</i>	<i>mu-</i>	<i>la-</i>	<i>ma-</i>	<i>mu-</i>	<i>la-</i>

In summary, variables involving grammaticalisation, omission of grammatical markers, and mergers of inflectional paradigms are not reported to induce meta-linguistic awareness, and therefore can be expected to play less role in schismogenetic change. The development of new grammatical markings is slow enough that it does not produce strong differences between age cohorts; but the loss of redundant markers, or merger of paradigmatic categories, can both happen quite quickly.

5.2. Ordering variables

There is a notable scarcity of ordering variables in the sample. This would appear to prevent us from saying anything about this type, but the absence could also be taken as meaningful: the lack of such variables, among studies that investigate sociolinguistic variation, may imply that ordering variables rarely have social correlations. In fact there is one ordering variable in the sample, which involves variable suffix ordering in Murrinhpatha (Southern Daly) (Mansfield 2015a). This appears to be changing within the period of a few generations, suggesting a rapid change. However it is unclear whether this is something particular to affix order variation, as opposed to word order. Overall, the sparse attestation of socially correlated ordering variables remains compatible with the expectation from evolutionary dynamic studies that grammatical order usually changes slowly, and without social influence.

5.3. Phonological mergers

Another type of change that occurs frequently in the sample is phonological mergers, where some speakers tend to collapse a phonological contrast maintained by others. Features neutralised include aspiration (Zhuang, Tai-Kadai; Stanford & Pan 2013; Madurese, Austronesian; Misnadin 2021), retroflexion (Javanese, Austronesian; Zen & Starr 2021), velar labialisation (Igbo, Atlantic-Congo; Opara & Mbagwu 2021; Máihĩki, Tukanoan; Skilton 2017) and rounded front vowels (Chichmec, Otomanguean; Lastra 2009). Most of these involve rapid changes across a few generations, and in some instances the merger is associated with a specific regional dialect. Language contact may again play a role, for example Madurese speakers in the western region have more contact with Javanese, and are losing the Madurese retroflex coronal distinction, which is absent in Javanese (Zen & Starr 2021). But while phonological mergers can happen quickly, none of the studies report meta-linguistic awareness of mergers. For aspiration mergers in Zhuang (Stanford & Pan 2013), which is a stable dialectal variable, it is specifically noted that speakers do not find the variation noticeable. Overall, it appears that phonological mergers can be rapid changes, which may result in differences between closely related varieties, but there is no evidence of mergers as schismogenetic change.

5.4. Form of grammatical markers

Several variables involve distinct phonological forms of a grammatical marker (e.g. an affix, clitic or particle), which in all instances involve a morphologically specific sound-change (Mansfield et al. 2023). These variables thus have a phonological aspect, but also a grammatical aspect. They don't necessarily affect grammatical structure or grammatical categories, but they have potential to do so, for example if they later facilitate category

mergers. The grammatical form variables in the sample tend to have social category correlations, and in some instances provoke meta-linguistic awareness.

One example is in Vatlongos (Austronesian), where verbal 2SG subject prefixes have alternate forms differentiated by an *a > o* innovation, e.g. *ote-* ~ *ate-* 2SG.PRIOR and *o-* ~ *a-* 2SG.NFUT (Ridge 2022). There is evidence that this is a rapid change-in-progress led by women, and speakers have meta-linguistic awareness of the variation, which they associated with the more urbanised community of Mele Maat, in contrast to the more traditional communities (Ridge 2022: 86). Similarly, in Oxchuc Tzeltal, definiteness is marked by a combination of proclitic and enclitic, but these have alternative forms (to simplify somewhat) *te*=[NP]=*e* ~ *i*=[NP]=*i* (Rocío Cruz Gómez 2008: 62). Speakers of all ages show style-shifting between the former variant in monitored speech and the latter in unmonitored speech, suggesting that these may be metalinguistically evaluated as correct and incorrect variants respectively (Rocío Cruz Gómez 2008: 144). However not all grammatical form variables provoke meta-linguistic awareness. In Máihiki (Tukanoan) there is variation between past tense suffixes, e.g. *-ao* ~ *-go* ‘3SG.F.PST’, which reflect parental dialects of the speakers, though in this case the variable is not the focus of meta-linguistic awareness (Skilton 2017: 102–108). Overall, grammatical form variables appear liable to rapid change, and are sometimes recognised as differentiating social groups.

5.5. Phonological reduction

The most frequent type of variable in the sample is phonological reduction. In most cases (though not all), younger people use a phonologically reduced variant more frequently than older speakers. In several cases this also induces meta-linguistic awareness, including negative evaluation from older speakers.

In Pitjantjatjara (Pama-Nyungan), there is a variable vowel deletion process targeting extrametrical vowels at word boundaries, which appears to have been active in the community for some time (Goddard 1985; Wilmoth 2022: 148). This is illustrated in (6a), where the word-final /i/ is external to the foot formed by the preceding two syllables. However younger speakers show signs of extending deletion to syllables that could fall within feet (note that codas are not moraic), as in (6b). Furthermore, a quantitative study of deletion in the specific context of verb-final tense suffixes shows that younger speakers here systematically extend deletion beyond the metrical constraint observed in older speakers (6c). Vowel deletion is sociolinguistically salient, with older speakers criticising younger speakers for their ‘short’ (*mutumutu*) pronunciation (Wilmoth et al. 2021). This is despite the fact that older speakers also produce deleted forms, though perhaps reflecting sensitivity to the more constrained contexts applied by older speakers, compared to younger speakers.

(6) Pitjantjatjara

- a. *A-na-ny(i) tjuwa-kutu*
 go-AUG-PRS store-ALL
 ‘Go to the store.’
- b. *Tjulp(u) panya*
 bird ANAPH
 ‘That bird.’ (Wilmoth 2022: 118–119)
- c. *Kunkun-ari-ŋ(u)*
 sleep-INCH-PST
 ‘Was beginning to sleep.’ (Wilmoth et al. 2021)

Phonological reduction accounts for most of the Australian Aboriginal variables in the sample. Several other instances involve word-initial reduction, including /p, k/ lenition in

Murrinhpatha (Southern Daly; Mansfield 2015b), /ŋ/ deletion in Bininj Kun-wok (Gunwinjguan; Marley 2021) and /ŋ/ deletion in Gumatj (Pama-Nyungan; Amery 1985: 45). In some instances there is evidence that initial reduction is part of a sound-change in progress (Marley 2021), others appear to involve age-graded style shifting (Langlois 2006), but in many studies there is insufficient evidence to decide between change-in-progress versus stable age-grading. This is the case for Murrinhpatha initial lenition, which is complicated by a potential contact effect. Data from older Murrinhpatha speakers generally shows stop realisations of initial /p, k/, while younger speakers often produce fricative realisations or other lenited variants (7). Older Murrinhpatha speakers identify stop variants as the correct forms, which some describe as *bangamlele* or ‘biting’ the words, but nonetheless, many younger speakers do not show any sign of style-shifting towards stops in careful speech. This variable may also be related to contact with Western Daly languages, where initial obstruents vary freely between stop and fricative articulations (Mansfield & Green 2021).

(7) Murrinhpatha (young speakers)

- a. *purtek* [puɽek ~ ɸuɽek]
ground
- b. *kardu* [kaɽu ~ xaɽu]
person (Mansfield 2015b: 206–209)

Beyond Australia, in Ende (Pahoturi) retroflex obstruents are frequently affricated in everyday speech as [tʂ, dʂ], but prestigious individuals with status as public orators prefer purely plosive variants [t, d] (Strong et al. 2022). In Nmbo (Yam) younger speakers favour initial /h/ deletion, which appears to be a rapid change-in-progress (Kashima 2020). In Australian and New Zealand Sign language, signs that are canonically produced at the forehead have lowered variants, which can be interpreted as a type of phonological reduction (reduced effort), and these variants are favoured by younger signers (Schembri et al. 2009). Other changes-in-progress are at or near completion, with young people almost completely shifted to reduced variants. For example in Oxchuc Tzeltal (Mayan), unstressed vowel deletion is highly frequent in younger speakers (Rocío Cruz Gómez 2008: 126), while in Chichimec (Otomanguan), initial /g/ reaches categorical deletion in young speakers (8) (Lastra 2009).³ In Inuit (Eskimo-Aleut), initial short vowel deletion approaches categorical deletion in young speakers (9) and is subject to style-shifting, likely forming part of the recognised youth speech style that is ‘bemoaned’ by older speakers (Clarke 2009: 112, 120).

(8) Chichimec

- a. *(g)a-kén*
1.FUT-pull
- b. *(g)a-rácʔ*
3.FUT-rub (Lastra 2009: 162)

(9) Inuit

- a. *(a)kuhp*
coat
- b. *(i)skeu*
woman (Clarke 2009: 122)

³ Chichimec /g/ only occurs word-initially in a few verbal prefixes, though it occurs medially in a variety of words.

Not all reduction variants are straightforwardly favoured by younger speakers as opposed to older speakers. In Máhĩki (Tukanoan), intervocalic /h/ deletion has regional dialect associations, and some speakers consider it perfectly acceptable while others consider it to be incorrect (Skilton 2017). In Fataluku (Timor-Alor-Pantar), the fricative /z/ is lenited to a glide in word-medial position, with a traditional rural dialect association (Grama et al. 2024). Raga (Austronesian) has initial /g/ deletion, favoured by both younger men and older men, potentially linked by their kava-drinking socialisation (Duhamel 2022). In Rotuman (Austronesian), middle-aged speakers delete /ʔ/, while older speakers retain it, which could be an instance of a common glottal-stop deletion processes in Oceanic languages (Fimone 2020). However in this instance, younger speakers, who are deeply concerned about the endangerment of the Rotuman language and the weakening of their ethnic identity, retain /ʔ/ as a sociolinguistically salient marker of Rotuman identity in the face of cultural homogenisation.

Alongside phonological reduction, the sample includes a few instances of phonological assimilation, where one segment is variably influenced by neighbouring segments. We might expect these to pattern with reduction variables, due to the general link between reduction and segmental context (Harris 1984; Katz 2016), and indeed the evidence suggests that assimilation variables are also amenable to socioindexicality. For example Eastern Cham has variably labialised nasal codas after rounded vowels, e.g. [uŋ ~ uŋm] (Baclawski 2018). The labialised variant likely derives from contact with Vietnamese, which has similar allomorphy. Earlier in the twentieth century the labialised variant was associated with women's speech, though it now appears to be spreading as a change among all speakers.

Overall, the multiple instances of phonological reduction (and assimilation) variables in diverse languages suggest that this is a very frequent form of sociolinguistic variation, often sociolinguistically salient, and often associated with youth speech. Since reduced articulation is present to some extent in all human language, it provides an ever-present means for younger people to annoy their elders. In some instances, youth reduction variants may become sound changes, and while this would apparently be favoured in situations where the reduction is unconscious, there is an intriguing possibility that salient reduction variables may also become sound changes, if older people are not able to impose a stylistic switch to phonologically conservative variants. At the same time, even if there is a tendency for reduction variants to be preferred by youth, this is not an inviolable rule, and other sociolinguistic dynamics may unfold due to contact between languages or dialects, or as we saw in Rotuman, ethno-linguistic identity becoming attached to a conservative variant.

5.6. *Lexicon*

Although lexicon is expected to be one of the main dimensions of schismogenetic change, there is little to report on lexicon in the sample. In fact lexicon generally tends to be excluded from variationist studies for methodological reasons (Durkin 2012). The sample includes one dedicated study of lexical variation in Kata Kolok, a Balinese sign language (Mudd et al. 2020), though this focuses on the degree of lexical variation within deaf vs hearing groups, and is not easily relatable to questions of evolutionary dynamics. Studies on dialectal variation in Sui and Zhuang (both Tai-Kadai) also describe some lexical variation, in both cases finding strong social indexicality as expected. In Sui, women move to their husband's village, where they are expected to maintain sociolinguistic markers of their own clan, especially lexicon (Stanford 2009). For example, women from the Pan group maintain use of a distinctive 1SG pronoun *ju*, after moving to a Zhang village where the local 1SG pronoun is *ej*. Shifting to the local pronoun would be considered an act of disloyalty to their own ethno-geographic heritage. By contrast, in Zhuang, where wives also move to their husband's village, women from the northern dialect group who marry into the southern dialect group are

expected to shift to the lexicon of their husband's group (Stanford & Pan 2013). Whether the rules is for lexical differentiation, or lexical shift, these dialect studies both demonstrate the social indexical importance of lexicon.

6. Discussion and conclusion

As we have seen, reviewing the increasingly diverse variationist literature reveals potential trends in the evolutionary dynamics of language. This offers an alternative approach to the existing tradition of comparative research, and in general the findings converge with comparative studies on several points. Table 2 summarises the observations made above, alongside expectations from the comparative research.

Table 2. Summary of expectations from comparative studies, and observations from diverse variationist studies.

VARIABLE TYPE	COMPARATIVE FINDINGS	VARIATIONIST FINDINGS
Grammatical categories	Core inflection: Slow change Pragmatic grammar: Rapid change	Grammaticalisation: Slow Redundant marker loss: Rapid Paradigmatic merger: Rapid
Ordering variables	Slow change, non-schismogenetic	<i>Limited evidence</i> , but compatible with slow change, non-schismogenetic
Form of grammatical markers	<i>Not distinguished in studies of rates of change</i> Dialect differentiation study suggests schismogenetic effects	Potential for rapid change and schismogenesis
Phonology	Rapid change (but varies by phonological feature)	Mergers: Rapid change, non-schismogenetic Reduction and assimilation: Rapid change, schismogenetic
Lexicon	Basic vocabulary: Slow change, but highly schismogenetic	<i>Limited evidence</i> , but studies report schismogenetic effects

Regarding grammatical categories, the comparative studies do not reach any strong overall generalisations, but appear to show differences depending on type of category. In the variationist studies just reviewed, potential differences were noted according to type of process, i.e. whether markers are being gained, lost, or merged. Both approaches broadly agree that ordering variables are likely to change slowly and without schismogenetic effects. The form of grammatical markers has not been investigated in phylogenetic studies, but the dialect differentiation study finds potential schismogenetic effects, which are echoed in some variationist studies.

In phonology, the variationist studies again suggest differences according to the type of process, which are not distinguished in the phylogenetic studies. Both studies suggest that at least some types of phonology can change rapidly, and variationist studies additionally suggest that phonological reduction and assimilation tend to provoke metalinguistic awareness. In both grammatical and phonological variables, language contact is potentially implicated in a high proportion of instances. This suggests that in small societies, where multilingualism is the norm (Lüpke 2016), contact plays an especially prominent role in language change.

As for lexicon, the variationist research does not add much to the existing picture, but what evidence we do find remains compatible with the idea that lexicon has a high schismogenetic utility. This may seem paradoxical alongside the phylogenetic finding that lexicon changes more slowly than grammatical features, since schismogenetic processes in general should drive more change. One potential resolution could be that schismogenetic lexical change does not tend to target the basic lexicon. Another possibility is that the number

of changes involved in a rapid, punctuational burst of lexical change is simply less than the number of grammatical featural changes built up slowly over a process of gradual change.

Clearly, much more research is required on the evolutionary dynamics of language. However between the variationist and comparative approaches, we can hope to gradually triangulate more findings. The contributions from variationism remain too sparse for a systematic meta-analysis, but the tentative patterns observed above should motivate further growth in this area. Ideally, the surge of variationist study in the Asia-Pacific region will be matched by similar growth in other regions, eventually producing a more detailed picture of linguistic dynamics at the community level.

Appendix: A sample of diverse variationist studies (see also Figure 1)

FAMILY	LANGUAGE	GLOTTOCODE	STUDIES
Arawakan	1 Baniwa	bani1255	(Gonçalves 2018)
Athabaskan	2 Navajo	nava1243	(Palakurthy 2019)
	3 Tlingit	tlin1245	(Cardoso et al. 2022)
Atlantic-Congo	4 Chasu	asut1235	(Yohana 2009)
	5 Ewe	ewee1241	(Noglo 2009)
	6 Igbo	nucl1417	(Opara & Mbagwu 2021)
	7 Xhosa	xhos1239	(Bloom Ström 2018)
Austronesian	8 Acehnese	achi1257	(Travis & Ghina 2021)
	9 Eastern Cham	east2563	(Baclawski 2018)
	10 Javanese	java1254	(Zen & Starr 2021)
	11 Kata Kolok	bali1278	(Mudd et al. 2020)
	12 Madurese	nucl1460	(Misnadin 2021)
	13 Maori	maor1246	(Harlow et al. 2009)
	14 Matukar	matu1261	(Barth 2020; Davey & Barth 2024)
	15 Nkep	hogh1234	(Meyerhoff 2015)
	16 Raga	hano1246	(Duhamel 2022)
	17 Rotuman	rotu1241	(Fimone 2020)
	18 Sasak	sasa1249	(Khairunnisa 2021)
	19 Tamambo	malo1243	(Meyerhoff 2009)
	20 Vatlongos	sout2859	(Ridge 2022)
	21 Vera'a	vera1241	(Schnell & Barth 2018; Schnell & Barth 2020)
	22 Yami	yami1254	(Lai & Gooden 2024)
Basque	23 Basque	basq1248	(Gondra et al. 2024)
Cochimi-Yuman	24 Kumeyaay	kumi1248	(Field 2012)
Eskimo-Aleut	25 Inuit	inui1246	(Clarke 2009)
Gunwinyguan	26 Bininj Kunwok	gunw1252	(Marley 2021)
Indo-European	27 Albanian	alba1267	(Riverin-Coutlée et al. 2024)
	28 Faetar	fran1269	(Nagy 2009)
	29 Persian	west2369	(Ghafar Samar & Bhatia 2018)
Lengua-Mascoy	30 Sanapaná	sana1298	(Gysel 2022)
Mayan	31 K'ichee'	kich1262	(Romero 2009; Romero 2015)

	32	Kaqchikel	kaqc1270	(Leonard 2009)
	33	Tzeltal	tzel1254	(Rocío Cruz Gómez 2008)
Otomanguean	34	Chichimeca	chic1272	(Lastra 2009)
Pahoturi	35	Ende	ende1235	(Lindsey 2021; Strong et al. 2022)
	36	Idi	idii1243	(Schokkin 2021)
Pama-Nyungan	37	(Light) Warlpiri	warl1254	(O'Shannessy 2008)
	38	Djambarrpuyngu	djam1256	(Wilkinson 1991)
	39	Gumatj	guma1253	(Amery 1985)
	40	Pitjantjatjara	pitj1243	(Wilmoth et al. 2021)
Quechuan	41	Chanka Quechua	ayac1238	(Povilonis & Guy 2022)
	42	Huaylas Quechua	huay1240	(Julca Guerrero 2010)
Sign Languages	43	American S.L.	amer1248	(Lucas et al. 2002)
	44	Auslan	aust1271	(Johnston et al. 2015)
	45	Hong Kong S.L.	hong1241	(Wei et al. 2018)
	46	Indonesian S.L.	indo1333	(Palfreyman 2020)
	47	Papua New Guinean S.L.	papu1255	(Reed 2020)
Sino-Tibetan	48	Angami	anga1288	(Suokhrie 2016)
	49	Black Lahu	lahu1253	(Yang et al. 2022)
	50	Ersu	ersu1241	(Chirkova et al. 2018)
	51	Manipuri	mani1292	(Satyanath & Laskar 2009)
Southern Daly	52	Murrinhpatha	murr1258	(Mansfield 2015b; Mansfield 2015a)
Tai-Kadai	53	Sui	suii1243	(Stanford 2009)
	54	Zhuang	yong1276	(Stanford & Pan 2013)
Timor-Alor-Pantar	55	Abui	abui1241	(Saad 2020)
	56	Fataluku	fata1247	(Grama et al. 2024)
Tucanoan	57	Máíhiki	orej1242	(Skilton 2017)
Tupian	58	Guaraní	para1311	(Shain & Tonhauser 2010)
Uralic	59	Finnish	finn1318	(Kuparinen et al. 2021)
	60	Hungarian	hung1274	(Csernicskó & Fenyvesi 2012)
Uto-Aztecan	61	Nahuatl	cent2132	(Vicente Ferrre 2017)
Washo	62	Washo	wash1253	(Yu 2008)
Yam	63	Nmbo	namb1293	(Kashima 2020)

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