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Abstract: In this paper, I introduce a situational approach to the study of linguistic complexity. As opposed to most research on linguistic complexity, which has focused on the grammatical complexity of languages, I consider this topic from a situational perspective. I make two proposals. First, I claim that languages can vary in their situational diversity. Languages that have been adapted for a wider range of communicative contexts are more situationally complex than languages that have been adapted for a narrower range of communicative contexts. To support this claim, I consider examples of situational diversity from across a range of different languages and varieties of languages, drawing on empirical research from linguistics and anthropology. Second, I claim that situational diversity can help explain variation in grammatical complexity. I propose that increasing situational diversity in a language over time should lead to decreasing grammatical complexity. Furthermore, I argue that this trade-off between situational and grammatical complexity could explain how overall linguistic complexity could be maintained across languages and over time.

Keywords: language complexity; language evolution; language variation and change; linguistic typology; register variation

1 The study of linguistic complexity

Linguists often compare the complexity of languages. Most commonly, this involves comparing individual grammatical systems based on the number of types of which they are composed (McWhorter 2007) or on the length of their linguistic descriptions (Dahl 2004).[1] For example, we can say the vowel inventory of English is more complex than Mandarin because it has more vowels (Maddieson 2013a), and the tonal system of Mandarin is more complex than English because it has more tones (Maddieson 2013b). Similarly, we can say languages that lack inflection like Hausa and Vietnamese have relatively simple morphologies (Bickel and Nichols 2013). The complexity of grammatical systems can also be compared within languages, including over time and across dialects. For example, we can say the English pronoun system was once characterised by greater complexity than it is today, especially due to the presence of additional second person pronouns (e.g. *ye, thou*), which are still found in some dialects (Trudgill and Chambers 2017).

Although these examples illustrate how the complexity of *individual* grammatical systems can be measured at a *local* level, the analysis of the *overall* grammatical complexity of languages or varieties of language on a *global* level is not as straightforward. Linguists have long debated if languages can vary in their overall complexity at all (Sampson 2009). Certainly, relatively high complexity in one system cannot be taken as evidence of relatively high complexity across all systems of a language, if only because greater complexity in one system may be offset by less complexity in another (Joseph and Newmeyer 2012), as the English and Mandarin examples suggest. This seems like a reasonable hypothesis about the nature of grammatical complexity, and one that is arguably endorsed by most linguists today (Newmeyer 2021), but if this were the

1 Comparing the complexity of grammatical systems in this way is what Miestamo (2008) calls an *absolute approach* to the analysis of linguistic complexity, which he contrasts with what he calls a *relative approach*, which involves comparing the difficulty associated with learning a language.

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case, change in the complexity of one system would need to somehow be balanced by change in the complexity of other systems. Whether such a mechanism exists and how it could maintain equilibrium in grammatical complexity across languages and over time is unclear (McWhorter 2001). In addition to helping to answer these questions, the analysis of the overall grammatical complexity of languages could help linguists better understand the causes and mechanisms of language variation and change, the typological diversity of human languages, and the emergence of language in our species.

There are two reasons why the comparative analysis of grammatical complexity is difficult to pursue (Moran and Blasi 2014). The first issue is technical. Even if measuring the complexity of grammatical systems at a local level is feasible, comparison requires corresponding systems to be identified cross-linguistically (Miestamo 2008), which is problematic as linguists do not generally agree on how to describe the grammar of any language, including how to divide grammars into systems (Haspelmath 2018; Joseph 2021). Comparing the grammatical complexity of languages at the global level is an even more challenging task because it requires methods for aggregating these types of local measures within and across languages. The second issue is ethical. Comparing the complexity of languages has long been a highly controversial topic in linguistics because such research risks being used to support claims that one language or dialect is superior to another, and even that the intellect of people who speak these varieties differs, which can then be used to justify discrimination. Such concerns are not academic. In modern times, examples of discrimination are perhaps most common in relation to the acceptance of languages and dialects in political and educational settings, including African American English (Labov 1982) and Australian Aboriginal languages (Freeman and Staley 2018). Although linguists have called attention to and opposed such injustices, we have also helped to advance these types of attitudes, for example, through the marginalisation of creole languages (DeGraff 2005). These are serious societal issues, which demand that the analysis of linguistic complexity be approached with care, but linguists can only engage with these issues seriously on a societal level, if we first engage with these issues seriously on a scientific level.

The goal of this paper is therefore to consider how to measure and compare the overall complexity of languages, dialects, and other varieties of language in a principled, ethical, and meaningful way. However, as opposed to focusing on grammatical complexity, I introduce a new *situational* perspective on linguistic complexity. I make two proposals. First, I claim that languages vary in terms of their *situational diversity*—the number of communicative contexts over which they are used or, equivalently, the number of *registers* with which they are associated. In other words, a language that has been adapted for communication across a wider range of contexts is more *situationally complex* than a language that has been adapted for fewer contexts, providing its users with a wider range of registers to learn and use in specific situations. Furthermore, languages can differ in their situational diversity across domains. For example, some societies may differentiate between an especially large number of legal, religious, or artistic contexts, resulting in differences in the distribution of registers across these societies. To support these claims, after defining the concepts of *situation* and *register variation*, I present examples of situational diversity across languages and other varieties of language, drawing on research in anthropology and linguistics, especially empirical research on the ethnography of speaking and register variation. Second, considering recent research on grammatical complexity, I propose that *increased* situational diversity in languages should lead to *decreased* grammatical complexity over time. I argue that the concept of situational diversity not only provides a new perspective on linguistic complexity, but an explanation for why languages might vary in terms of their grammatical complexity. Finally, I argue that a cognitive trade-off between situational and grammatical complexity may provide the mechanism through which equilibrium in overall linguistic complexity could be maintained across languages and over time.

2 Situation and register variation

This paper considers the relationship between the diversity of the situations over which a language is used and the overall linguistic complexity of that language. By *situation* I mean the *communicative context* in

which any instance of language use occurs, as defined by the full range of extra-linguistic variables that can be used to describe any communicative event, including but not limited to the mode and medium through which the participants communicate, the physical location of the participants, the number, roles, and relationships between the participants, and the communicative purposes of the participants (Biber and Conrad 2019). Furthermore, I define a *register* as a variety of language that is associated with a specific communicative context (Biber and Conrad 2019). Different registers are associated with different situations. Notably, situations, and by extension registers, can be defined at any level of generality. For example, we can make a broad distinction based on mode of communication, distinguishing between speech and writing. But we can also make much finer distinctions. For example, within spoken English, registers include monologues and dialogues, face-to-face and telephone conversations, and service and sales calls.

In addition to their situational characteristics, registers are associated with distinctive patterns of language use. Often these patterns are measured based on variation in the rate at which different grammatical forms tend to be used in texts from that register (Biber 1988; Biber and Conrad 2019). For example, in English and other languages, speech and writing tend to be distinguished by variation in the use of a wide range of linguistic forms, such as the more frequent use of pronouns and interjections in speech and the more frequent use of nouns and noun modifiers in writing (Biber 1988, 1995). Furthermore, these differences in the frequencies of grammatical forms do not reflect arbitrary conventions: they directly reflect variation in the affordances, constraints, and communicative goals associated with specific situations. The context in which language is used shapes the way language is used. For example, writing tends to be characterised by more frequent use of complex noun phrases than speech in part because writers generally have more time to carefully construct dense sentences that convey complex information, whereas speakers are more likely to interact spontaneously with less opportunity for planning. Similarly, face-to-face conversations tend to be characterised by a higher rate of certain pronouns than telephone conversations because interlocutors have a shared visual frame of reference, allowing entities to be identified via pronoun use combined with gesture and eye gaze.

It is also important to distinguish *registers* from *dialects*, which are varieties of language defined based on the social and regional background of people, as opposed to the situations in which people use language. These two types of variation are related (Finegan and Biber 2001). For example, people who write academic papers tend to be well educated, while people who give sermons tend to be religious. Furthermore, registers tend to be based in part on the dialects of the social groups who created and who most often communicate in those situations. Nevertheless, register and dialect variation are distinct sources of variation: in principle, people from any social background can participate in any of the registers of their language using their own dialect, while also conforming to the patterns of that register. For example, academic papers can be written in a wide range of national dialects.

Although there is considerable variation in how the terms *situation* and *register* are used in linguistics (Biber and Conrad 2019), my intent is to define these terms broadly so that the proposals being made in this paper are meaningful to linguists from different theoretical backgrounds, including formal linguists who are generally concerned with the nature of grammatical knowledge as opposed to the nature of situated language use. Despite this distinction, it is important to acknowledge that because users of a language are able to recognise and produce patterns of linguistic variation that are associated with different communicative contexts, this type of situational variation necessarily reflects a form of linguistic knowledge, which is often referred to as *communicative competence* (Rickheit et al. 2008). These patterns of language use must be learned by people if they are to communicate effectively in these situations. It is not necessary to agree on where exactly the boundary between this type of communicative knowledge and grammatical knowledge lies (or the distinction between *linguistic performance* and *linguistic competence*) to appreciate the basic argument I am making in this paper, which is that situational diversity provides an important perspective *in general* for understanding variation in the *overall* linguistic complexity of languages, dialects, and other varieties of language.

3 Situational diversity

To support my claim that languages and varieties of language vary in terms of their situational diversity, in this section, I consider a range of examples of situational diversity drawn from previous empirical research in linguistics and anthropology. Although linguists have primarily been interested in comparing linguistic complexity across languages, I begin by discussing variation in the situational diversity of registers because these examples provide a relatively simple illustration of my basic claim. Specifically, because registers can be defined at any level of generality, where one broadly defined register can be composed of many more narrowly defined registers, registers must vary considerably in their complexity: the more sub-registers encompassed by a register, the more situationally complex it will be.

For example, consider spoken English, a very generally defined register of the English language. As noted above, spoken English is composed of a range of sub-registers, each conforming to the general patterns of spoken English, while being characterised by their own distinct patterns of language use (Biber 1988). For example, varieties of spoken English are generally characterised by frequent use of pronouns, compared to written English, but different pronouns are more or less common in different sub-registers, like the frequent use of second person pronouns in personal conversations. Spoken English is therefore necessarily more complex than any of its constituent registers. A complete description of spoken English usage would need to be far more extensive than a comparably detailed description of any of its sub-registers, as it would need to include descriptions for each of these sub-registers. Similarly, an individual's knowledge of spoken English is necessarily more complex than their knowledge of any of its sub-registers. Part of knowing how to speak English is knowing how to vary the structure of language across different contexts where speech is used for communication. Furthermore, the complexity of the registers of a language can be compared based on this variation. For example, it seems clear that registers of American English related to popular sports like baseball —which range from box scores to injury reports to opinion pieces—are more diverse than registers related to less popular sports like sumo wrestling.

Following this same basic approach, we can observe variation in the situational complexity of other varieties of language, including languages and dialects, and even the idiolects of individuals. For example, consider change over time in the complexity of the language known and used by one person. The general linguistic knowledge of any person includes information on how to vary the structure of their language across different situations. The complexity of this knowledge generally increases over time as people are naturally exposed to a wider range of communicative contexts, well past the putative critical period for first language acquisition. Although basic grammatical competence may have been reached by a relatively young age, we undeniably continue to extend our communicative competence throughout much of our adult lives as we learn new registers, although this process presumably slows down and eventually reverses in later years. In the modern world, this is achieved most explicitly through education systems, where students learn how to read and write and communicate across a wide range of specific communicative contexts—how to talk to a teacher, how to give a presentation, how to write an essay or a lab report. This type of learning, however, is not restricted to school. For example, part of starting a new job is learning how to communicate effectively in that domain, while part of finding a partner is learning how to flirt.

Similarly, we can observe changes over time in the situational diversity of a single language. For example, we have experienced this type of change directly over the last few decades with the rise of a wide range of forms of internet communication, which are distinct in many ways from offline registers, as well as from each other (Grieve et al. 2010), shifting how we communicate and necessitating that we learn new patterns of language use suitable for effective communication in these new situations. The rise of communicative technologies generally engenders language change, especially writing, whose introduction appears to lead to an explosion of new registers in any society (Biber 1995; see also Maas 2009). In this way, the rise of new communicative technologies can directly increase the complexity of a language, expanding the range of situations where that language is used. This process, however, is far more general. As a society grows in complexity over time—for example, due to increased diversity in cultural, governmental, and commercial contexts—so too does the

communicative landscape in which members of that society interact, which in turn directly affects *how* they use language.

This is not to say the situational diversity of languages never reduces over time. Entire forms of communication regularly fade out of existence, like telegraphs and faxes, although often they would appear to be replaced by more effective forms of communication that encourage *increased* register diversification, like telephones and emails. However, the overall loss of register diversity is also a fundamental part of the process through which language death occurs, especially when one language replaces another (Brenzinger and Dimmendaal 2012). In such cases, the dying minority language is not only used by an increasingly small number of people, but over an increasingly small number of situations, where the dominant language becomes the only option, if only because the people with whom one needs to interact only know the dominant language. Furthermore, as the number of situations in which a dying language is used contracts, at some point the situational diversity of the dominant language must overtake the dying language. A language dies not only by losing users but by losing registers. This does not imply the linguistic knowledge of users of a dying language is less complex than the users of the dominant language, as these people are often bilingual, able to communicate across a range of registers in both languages.

Apart from the process of language death, there is considerable cross-linguistic research that shows that languages vary substantially in their levels of situational diversity, both overall and within specific domains. Evidence comes from both qualitative research on the *ethnography of communication* (Bauman and Sherzer 1975; Saville-Troike 2008) and quantitative corpus-based research on *register analysis* (Biber and Conrad 2019). For example, taking an ethnographic approach, Gossen (1971) presented a taxonomy of genres of verbal behaviour in Chamula society in Mexico. In addition to everyday conversations, Chamula encompasses various registers of what are known as 'emotional speech' (e.g. children's songs, court speech, political oration) and 'pure words' (e.g. true recent narratives, true ancient narratives, prayers). Notably, Goosen did not identify these registers himself: they are all named by the Chamula, recognised as distinct and important communicative contexts in their society. Similarly, Sherzer (1983) described the range of communicative contexts encountered in the Kuna society in Panama. These registers include forms of everyday conversation as well as three more specialised registers associated with politics, curing and magic, and puberty rites, each encompassing several sub-registers.

Taking a corpus-based approach, Biber (1995) conducted a multidimensional analysis of grammatical variation across corpora representing the major registers of four languages—English, Korean, Somali, and Tuvaluan—through collaboration with local researchers, identifying considerable differences in register variation across these languages. For example, Biber notes the wide range of contract law sub-registers in English and the unique specialisation of Somali news registers, reflecting the cultural priorities of these societies. Alternatively, he discusses the relatively limited number of registers of spontaneous public speech in Korean, reflecting certain traditional values of this society. Biber also highlights how the development of literacy in a society leads to a proliferation of new registers, with the diversity of these registers depending on how long writing has been in existence in that society and the degree of literacy across the population. For example, Tuvaluan, where literacy is relatively recent, only has two major written registers in which people regularly participate—personal letters and scripted sermons.

Situational variation across these languages illustrates that languages can vary broadly in their situational complexity, both in general and within more narrowly defined domains. For example, English and Korean appear to encompass a much wider range of registers than Tuvaluan or Kuna, exemplifying how larger societies with more diverse social structures can be characterised by more diverse registers overall. Alternatively, English and Korean do not have the same range of ceremonial religious registers as Tuvaluan or Kuna, reflecting the greater importance of these specific communicative contexts in these societies.

My proposal is that the analysis of situational variation in a society, grounded in the beliefs and practises of its people, allows for an understanding of the overall linguistic complexity of its language—not directly in terms of its grammatical complexity, but in terms of the range of situations over which it is used to allow for communication to be achieved in efficient, effective, and recognisable ways. Situational diversity mirrors societal complexity: the greater the number of distinct communicative contexts recognised by members of a

society, the more diverse the registers of their language. The registers of a language represent the unique structure of the society that uses that language. Every day people are striving to make their language exactly as situationally diverse as their society requires at that point in time.

Enumerating the registers of a language is therefore a meaningful way to measure the linguistic complexity of a language. As I have begun to demonstrate in this paper, measuring linguistic complexity in this way can best be achieved through ethnographic fieldwork, ideally conducted by or with members of the society, to describe how many culturally distinct communicative contexts are recognised by that society and how they are organised (e.g. hierarchically). Crucially, this does not require any linguistic analysis: these contexts should be named by the society and known to its members. We should trust these categories and we should trust that they have linguistic consequences. There is nothing to judge from a linguistic perspective: we can only accept the communicative contexts identified by members of a society and describe the effect of these social structures on patterns of language use. Further and more systematic ethnographic research of this type is necessary if we are to fully understand variation in the linguistic complexity of languages of the world. The study of linguistic complexity cannot be restricted to formal structural analysis of language; it requires understanding of the structure of the society in which language use is embedded and the communicative needs of its speakers.

4 The relationship between situational diversity and grammatical complexity

In this paper, I have argued that languages vary in their situational complexity, with languages characterised by increased situational diversity also characterised by increased complexity in their patterns of language use. A language that has been adapted for communication across a wider range of contexts provides its speakers with a wider range of registers to learn and use, and is therefore more complex from a situational perspective.

I have been careful, however, not to imply that the underlying grammars of languages exhibiting different levels of situational diversity are any more or less complex. Grammatical complexity and situational complexity are two distinct forms of linguistic complexity, especially if we accept that some kind of distinction can be drawn between linguistic competence and performance. Crucially, the grammatical patterns that characterise any register must be licensed by the grammar of that language. Each register of a language can be seen as a probabilistic instantiation of the grammar of that language – a specification of what types of grammatical structures are most useful in a given communicative context. For example, written and spoken English both contain nouns and pronouns, and their use is constrained by the same underlying grammar, but the frequencies of these forms and how they are used differ substantially across these registers because there is variation in the communicative needs of people who interact in these situations and the communicative affordances and constraints associated with these situations.

Whether there is a stronger link between situational diversity and grammatical complexity is an empirical question, which should be pursued through large-scale typological research. For example, situational diversity could be measured across languages of the world, following the general ethnographic approach outlined in this paper, and correlated to measures of grammatical complexity, of the type that have been the focus of research on linguistic complexity until now. The relationships between specific dimensions of situational and grammatical complexity cross-linguistically might be especially fruitful areas to explore. However, to conclude this paper, I wish to consider the link between grammatical complexity and situational diversity from a different perspective, synthesising the results of two lines of existing empirical research that has explored the relationship between linguistic complexity and population size.

First, recent research on grammatical complexity has found that languages used by societies with larger populations are often associated with simpler grammars, at least from a morphosyntactic perspective (Lupyan and Dale 2010; Trudgill 2011; Raviv et al. 2019). For example, Lupyan and Dale (2010) observed that languages with larger populations tend to exhibit simpler morphologies, a relationship that has recently been replicated

in artificial language learning experiments (Raviv et al. 2019). These results are often explained by appealing to the effect of language contact, as adult second-language learners are assumed to be more common for larger languages and to simplify grammars over time.

Second, cross-linguistic research on register variation, as reviewed in the previous section, suggests that languages used by societies with larger populations (like English and Korean) are generally associated with greater situational diversity. This seems plausible as greater diversity in communicative context is presumably both a prerequisite for and a product of population growth. For example, the development of new contexts for communicating about topics like agriculture, government, and healthcare can lead to population expansion, while population expansion can lead to the development of new contexts for communicating about topics related to laws, arts, and recreation.

Taken together, these two putative relationships between language and population size appear to predict that languages associated with *increased* situational diversity will be associated with *decreased* grammatical complexity. Although this may seem counterintuitive, I believe this claim is not only reasonable but may provide a basis for explaining *why* languages with larger populations tend to be less grammatically complex in a more general and insightful way than by appealing merely to the influence of second language learners or language contact, which clearly are not generally necessary for language change, given that language change occurs in isolated populations. Specifically, my hypothesis is that the grammars of languages spoken by larger populations tend to be simpler than the grammars of languages spoken by smaller populations because they tend to have developed over time to be more well-suited for use across a wider range of communicative contexts. The greater the situational diversity over which a language is used, the greater the value of a relatively simple grammar, as this facilitates the variable use of language across a wider range of communicative contexts. If we see a register of a language as a probabilistic instantiation of its underlying grammar, then a simpler grammar is, in a sense, better suited for adaptation to new situations, as it is more flexible, placing fewer restrictions on how language can be used, allowing for greater linguistic variation and hence specialisation. Languages being adapted to be more amenable for second language learning would be one of many contextual forces that could lead to the simplification of the grammar of a language over time.

The concept of situational diversity, as introduced in this paper, therefore not only provides a new perspective on the measurement of linguistic complexity, but may provide a basis for the formulation of a general functional explanation for the evolution of grammatical complexity, specifying how situational factors can drive language change. Assuming languages with growing populations tend to become more situationally complex over time, my hypothesis is that the grammars of such languages – including most major languages of the world – would tend to simplify over time, at least after some stage of initial development, with the rate of language change linked to the rate of societal diversification due to the emergence of new communicative contexts. The diversity of communicative contexts found in a society – and recognised by its members – might even offer a general measure of societal complexity.

Crucially, this hypothesis about the nature of linguistic complexity and language change can be directly pursued with current data and methods for one language at a time and for one grammatical system at a time, avoiding some of the pitfalls associated with empirical work on linguistic complexity. Research on dialect levelling (Cheshire et al. 1993), cross-linguistic simplification in morphology (Sims-Williams and Baerman 2021), and the development of discourse structures (Groom and Grieve 2019), for example, may be interpreted as offering some initial support for this claim. Notably, this hypothesis also points to a reciprocal relationship between linguistic competence and linguistic performance, where core grammatical knowledge not only constrains patterns of language use across communicative contexts, but where the demands of language use across these contexts leads directly to change in the underlying structure of the grammars of languages. Variation in communicative context can be seen as fulfilling a similar role in the evolution of language as variation in the physical environment in the evolution of species.

Finally, my hypothesis that the grammatical complexity of languages decreases as the situational complexity of languages increases may also provide a basis for explaining how *overall* linguistic complexity could be maintained across languages and over time. Specifically, this inverse relationship between grammatical and situational complexity could be a product of a cognitive trade-off between knowledge of language

structure and knowledge of language use. Assuming the amount of cognitive resources that can be devoted to language in general is limited and consistent across populations, a society that encourages its members to develop relatively complex situational knowledge would also encourage the development of relatively simple underlying grammars over time. If we accept that the intellect of the members of all societies are equivalent, this is how equilibrium in general linguistic complexity could be naturally maintained. Languages can vary in terms of their grammatical and situational complexity, but the overall *linguistic* complexity of all languages is the same, determined by the general cognitive capacities of our species. In this way, a situational approach to linguistic complexity has the potential to address the serious and legitimate ethical concerns about language-based discrimination that have limited research on linguistic complexity for so long.

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