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Linguistic Variation

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Languages and their users show considerable variability. While crosslinguistic variation amongst the world's 7,000 or so languages is self-evident, there exists significant variation amongst individuals (i.e., individual differences) and within and across communities of language users (i.e., sociolinguistic and dialectal variation). For instance, at the individual level, there is variability in the rate with which children acquire language and in adults' ultimate attainment. There is also consistent language-internal variation in the way users produce language. This is evident both in how they say something (e.g., differences in pronunciation of words) and what they say (e.g., differences in the expression of the same or similar ideas). Finally, there is variation across linguistic communities in the form of dialects, which mark language users as part of a sociolinguistic and geographically defined group. Linguistic variation is important because it sheds light on how languages are acquired and represented, how they interface with other cognitive and social variables, and how variation leads to language change across time.

History

The study of linguistic variation has a checkered history in cognitive science. It has long been acknowledged in disciplines like psychology that individuals vary in systematic and measurable ways ([Cronbach, 1957](#)). This variation is most clear in studies of individual psychology, which explicitly investigate how humans vary on continua like personality traits. Likewise, in anthropology, it has long been assumed that groups vary on cultural grounds. However, for many years the study of linguistic variation was not considered to be important to the central enterprise of developing theories of language. In this vein, [Chomsky \(1986\)](#) wrote that variation “is marginal and can safely be ignored across a broad range of linguistic investigation” (p. 18). In contrast, [Levinson \(2012\)](#) called the denial of variation and diversity in human cognition the “original sin of the cognitive sciences” (p. 397). There is growing acknowledgment that a full explanation of the cognitive and social bases of language must incorporate variation.

Historically, questions regarding linguistic variation have been tackled in ways that met the immediate goals of subdisciplines. For example, the field of first language acquisition [see [Language Acquisition](#)] has sought to explain why some children acquire language faster than others, and conversely, why some children lag behind their peers ([Bates et al., 1995](#)). This interest derived from an obvious fact: even an untrained observer can tell that children vary in their rate of learning. The observation also extends to adults acquiring an additional language. In contrast, in adult psycholinguistics [see [Psycholinguistics](#)], a comparatively smaller number of studies focused on variation in first language processing, perhaps because the differences in skilled language processing are subtle and fewer in adulthood. On the other hand, the field of *variationist sociolinguistics*, inspired by [Labov \(1963\)](#), systematically investigated how language use varies in defined contexts, including linguistic factors (contexts of use—e.g., when a word's pronunciation is influenced by words around it) and social factors external to the linguistic context, such as a speaker's age, gender, and social affiliations. For example, in American English, there is large variation in the way grammatical words like *the*, *that*, *and*, and *I* are pronounced, and this depends on

variables such as where they occur in an utterance (they are longer in duration at the beginning and end of utterances) and who is using them (female and older speakers produce words of longer duration; [Bell et al., 2003](#)).

The study of dialectology has a long tradition, at least in Europe, having roots in 19th century philology. Notably, in their attempts to construct historical links between languages, philologists observed that some dialects tended to preserve older, more regular language features from their historical relative, whereas “standard” forms (e.g., Received Pronunciation in English, or High German) might have undergone greater historical change, moving towards the use of more similar language features through a process called *leveling* ([Petyt, 1980](#)). Thus, dialect variation was a valuable form of evidence in historical reconstruction. Many *language atlases* were subsequently published on dialects (or “varieties”) of languages in Europe and beyond, and so dialectology became a field in its own right. More recently, research has investigated naive participants’ knowledge of dialect variation in their language ([Preston, 1999](#)). In these studies, participants are asked to describe variation they have noticed, with results showing that people recognize and attach meaning to different manners of speaking.

Core concepts

Two core assumptions underlying the study of all forms of linguistic variation is that it is both *systematic* and *constrained*. Consequently, variation should be predictable from a range of linguistic and non-linguistic variables and reveal underlying and describable patterns. For instance, variation in children’s acquisition of morphology appears tightly linked to the size of their vocabulary ([Bates & Goodman, 1997](#); [Frank et al., 2021](#)). Variation in processing speed, working memory [see [Working Memory](#)], executive function, and statistical learning [see [Statistical Learning](#)] have been linked to both acquisition and adult language processing (see [Kidd et al., 2018](#)). Overall, studies of individual differences in language point to linguistic experience in interaction with internal cognitive variables (e.g., memory) as important predictors of variation in language proficiency. However, there is as yet no coherent account of what variables matter and how they interact.

Studies of sociolinguistic variability reveal that speakers choose particular forms (e.g., pronouncing the English progressive morpheme as *-ing* or *-in*, e.g., *working* versus *workin’*) depending on range of factors, such as their geographical region, age, gender, and social class, to name a few. Though languages can tolerate variability (e.g., *-ing* vs. *-in’* has existed in English for hundreds of years), often one form will win out over another, therefore leading to language change. Thus, variability is a precondition for language change ([Weinreich et al., 1968](#)). Change occurring in specific regions or in cultural groups can result in new varieties that are identifiable by these *shibboleths* (i.e., words or phrases that are identifiable with a particular social group). One prominent example is the innovative use of copula BE in African American English ([Green, 2002](#)). Another is the emergence of *innit* as an invariant tag question in British English (e.g., *you don’t got chips, innit?*), which emerged in London and is most identifiable with London English ([Cheshire, 1982](#); [Pichler, 2021](#)).

A common thread that links all levels of linguistic variation is that its study offers a method for understanding the dynamic processes of language. Thus, understanding what may contribute to individual variability in language proficiency tells us something important about the architecture of language in individual minds. Similarly, understanding sociolinguistic variation illuminates the complex reasons people speak the way they do. Ultimately, these different levels should be related to each other: Individuals form groups, which form language communities.

Questions, controversies, and new developments

Although it is safe to assume that individuals and groups vary in their use of language, determining the sources of variation is a key challenge because many variables are likely to be involved. Thus, an important question for any study of variation is exactly which variables to choose. Related to this issue of what to measure is how to measure variables. A key controversy in studies of individual differences is their measurement. In particular, individual differences measures must meet high standards of reliability and consistency. That is, they must accurately rank individuals on a concept (e.g., vocabulary), and that ranking must be consistent across time. This is different from how experimental designs deal with variability (see [Hedge et al., 2018](#)).

Another key controversy that pervades studies of variability concerns social attributions (intended or unintended) linked to differences. For instance, studies that have linked socioeconomic status to language acquisition have been criticized for ignoring the many variables that contribute to development ([Sperry et al. 2019](#)). Concerning sociolinguistic variation and dialects, it is not uncommon for speakers to rank variants or dialects as more prestigious than others, which can have far-reaching implications, for example, via linguistic discrimination ([Craft et al., 2020](#)).

Broader connections

The study of linguistic variation naturally connects subfields of linguistics and connects language to language-interfacing cognitive and social variables. This set of connections underlies an important point: there is little about humans that does not vary, from gene expression to complex social systems. The challenge is to identify the range of that variation and determine how it reflects deeper insights into language.

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