

Aging language and language typology, or why we should pay attention to cross-linguistic features when studying aging

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Abstract. Studies of language and aging have generally found similar patterns across users of different languages. However, there have been a few studies that have found differences, and these merit more attention. These differences can provide insight into the ways that the experience of aging differs among users of these languages, which can be useful information for practitioners. It can also uncover underlying differences in the target languages that researchers might not otherwise recognize, which could prove useful for theoretical investigations of language as well as provide ways to better inform directions for future research into language and aging.

Keywords. language typology; compensation; aging; vocabulary; phonology

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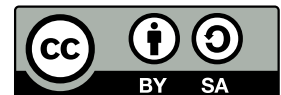
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1 Is aging language cross-linguistically systematic?

In the last decade, studies on phonetic changes in aging have demonstrated a high level of systematicity across languages. The native language factor does not seem (or, at least, has not seemed so far) to influence how phonation and articulation are altered as speakers age following either healthy or pathological itineraries. Indeed, speakers of languages so different as Spanish, Hungarian, Basque, French, or Japanese present a very similar pattern of acoustic, prosodic, and temporal deviations even though the phonological systems of their languages are characterized by marked segmental and suprasegmental differences (Ivanova, Martínez-Nicolás, and García Meilán 2023). Yet, even such strong systematicity in phonetic decline agrees with the fact that language typology can cause and actually causes certain deviations in how older adults speak. Crucially, typological variation has been consistently disregarded in most research on aging language. At present, nonetheless,

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the effect of language typology is gaining increasing weight in language studies across the lifespan. Child language development is deeply sensitive to the typological properties of the first language (Ravid, Levie, and Ben-zvi 2003), even in clinical populations (e.g., Leonard 2022 for Developmental Language Disorder, or Martínez-Castilla et al. 2012 for Williams Syndrome). Similarly, as suggested by work on bilingualism in aging, language typology can be determinant in predicting the degree of cognitive advantage from language learning (Antoniou and Wright 2017). Truly indeed, while the general pattern of aging-related neurocognitive change is more or less stable across populations (Benítez-Burraco and Ivanova 2023), cross-linguistic aspects of language change in aging cannot be disregarded straight off. In their seminal study, Juncos-Rabadán and Iglesias suggested that aging speakers of languages so different as Azari, Basque, English, Farsi, Hungarian, or Swedish (to mention only a few) show similar patterns of language decline as measured by Bilingual Aphasia Test (Juncos-Rabadán and Iglesias 1994). In contrast, performance on such a classical neuropsychological test as Digit Span Task is directly influenced by the language type, conditioned by the patterns of phonological length of each specific language (Ardila 2020), that is, its clustering properties. Such controversial data suggests that, despite a common pattern of language involution parallel to cognitive decline, certain aspects of aging language cannot be adequately understood (and, in fact, may lead to misinterpretation) without considering cross-linguistic differences.

2 How does cross-linguistic variation affect aging language?

To which extent cross-linguistic differences are to be considered in the study of aging is a challenging question. Certainly, much evidence points to cross-linguistic systematicity of aging language. Yet, typology may become a relevant feature for an adequate interpretation of how (and why) aging speakers perform on different language tasks considering the language domains they test and the cognitive functions they involve. Truly indeed, some language domains seem more cognitively robust against cross-linguistic variation. Accordingly, some tasks can level out important typological differences by eliciting more universal language properties. An insightful example comes from the comparison of two fluency tasks, based on semantic and phonological cues, respectively (see Rosselli et al. 2002): while semantic fluency largely favors more shared, cross-linguistically universal units (mainly, concrete nouns), phonological keys unchain dissimilar productions, as driven by the specificity of grammatical boundaries of each specific language. This has an obvious parallel with the cognitive embedding of semantic tasks, in which reliance on categorization is usually more automatic, against phonemic tasks, in which reliance on specific rules involves high-order functions (Rosselli et al. 2014). It is eye-catching, however, that semantic categorization is not cross-linguistically consistent and, actually, a strong reliance of semantic fluency on language-specific functions (e.g., access to semantic storage and vocabulary access and retrieval) (Ostrosky-Solis et al. 2007) begs the question about the plausibility of cross-linguistic semantic systematicity.

Examples like this can be found in all language domains. In phonetics, aging-related changes can be driven by how each specific language preconditions speech temporalization. Language-specific compensatory strategies during spontaneous uttering can drive dissimilar (or even opposite) patterns of change in such a stable motor variable as articulation

rate (see Gerstenberg et al. 2018 for a comparison between French and German). In vocabulary, the distributional frequency of letters predicts cross-linguistic lexical fluency (Oberg and Ramírez 2006) and the group of sensitive predictors of naming in different languages includes word frequency, AoA, conceptual familiarity, and word length (Kremin et al. 2003), which cross-linguistically vary. In syntax, the dominant word order (e.g., right-branching or left-branching) predicts working memory performance, possibly imposing cognitive challenges and facilities on processing of specific structures (Amici et al. 2019), which could explain how speakers of different languages age grammatically. Importantly, even semantics is not free of cross-linguistic variation. A comparative analysis of semantic fluency task in 15 languages (Ardila 2020) showed that such a highly universal semantic category as ‘animals’ can report significant differences in the number of elicited words when all other relevant variables are controlled for. Surprisingly, a recent experimental research (Ivanova et al. 2020) also proved that ‘animals’ is not sensitive as a semantic category to the discrimination of healthy and pathological aging in Spanish language. However, Spanish is significantly more enriched in semantically empty compensatory units (the so-called discourse markers) in comparison with other languages (Ochoa-Obeso, Ivanova, and García Meilán, 2023 (forthcoming); Ivanova, Martínez-Nicolás, and García Meilán 2023).

3 Why to consider cross-linguistic variation in aging language?

A common pathway of aging-related cognitive decline guides quite a regular pattern of language change in aging. Roughly, older speakers systematically show a growing difficulty in word retrieval and a gradual decline in syntactic complexity (Benítez-Burraco and Ivanova 2023; Marini 2017). Yet, as discussed above, cross-linguistic peculiarities can lead to significant variation in how speakers of different languages perform in different language domains, including such robust levels as phonetics and phonology.

Implications of considering cross-linguistic variation in aging are quite a few. For Clinics, typologically focused patterns of language can be very sensitive to early discrimination of healthy and pathological aging. Furthermore, it looks essential to determine to which extent neuropsychological testing is to be adapted cross-linguistically. This is particularly relevant considering that cross-linguistic information on how healthy and pathologically aging speakers perform in different neuropsychological tests is still very scarce (Ardila 2020). Neither there is available a necessary representative sample of language change in aging for most World languages.

However, implications will be no less important for Linguistics. A cross-linguistic perspective can provide strong experimental data about the robustness of language domains, specific language phenomena, and their language-specific parameters. It could also approach us to answering one intriguing, yet very little explored aspect: how aging language trajectories frame cognitively favored structures, and which language structures are indeed cognitively favored in natural languages.

Definitely, cross-linguistic research should be if not central, at least relevant to our understanding of language change in different aging itineraries. However, this is only a necessary start to consider one of the most important issues in aging: its variability. Aged speakers are diverse biologically, psychologically, and socially, with aging being an unequal, cumulative, and individualized process (Pichler, Evans Wagner, and Hesson 2018).

Cultural contexts of language use can be significant in estimating how language ages in speakers of the same language separated by cultural differences. What's more, some very recent views from sociolinguistics, especially those based on panel studies, suggest lifespan changes in language use (Buchstaller 2015). Crucially, such lifespan changes across language domains (e.g., phonetics vs. grammar) do not necessarily evolve in the same direction, varying from more conservative or stable to more progressive (Sankoff 2019). All the stated means that there is still an important gap in our understanding of how language typology specifically, and language variability in general, can affect not only the language assessment of aging as healthy or pathological but also how aging affects language itself.

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