

A study of Individual Differences in L1 Grammatical Comprehension of Complex syntax

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The traditional assumption in generative linguistics is that all native speakers converge on (more or less) the same grammar, which is a key argument in favor of the universal grammar (UG) hypothesis. However, in usage-based linguistics, it is not assumed that all speakers achieve the same outcomes in their language learning. Instead, individual differences in (a) experience and (b) abilities are expected to have an effect on language learning outcomes.

We present a study that explores the potential effects of various factors on grammatical comprehension in adult native speakers. In order to account for the individual differences in experience, we measured print exposure (since the written input is syntactically more complex than the spoken input). In order to account for the individual differences in abilities, we measure implicit and explicit memory for sequences, (non-verbal) working memory, and language analytic ability (a measure of metalinguistic awareness). In addition, our study included two additional measures which are intended as control conditions: sustained attention (which assess participants' ability to stay focused on a task) and mental calculation (a secondary measure used in our working memory task that we expect to be unrelated to grammatical understanding).

We recruited 79 UK native speakers of English for this study. We measured grammatical comprehension via a force-choice task in which participants read sentences that contained structures relatively complex from the syntactic point of view, such as (2). They were then asked to answer comprehension questions, such as (2a-c).

- (2) Linda complained that the fact that cycling in the main square is forbidden annoys tourists.
- What did Linda complain about? (That tourists are annoyed. / That cycling is forbidden in the main square.)
 - What is forbidden? (Complaining about the cycling restrictions. / Cycling on the main square.)
 - What annoys the tourists? (That one is not allowed to cycle in the main square. / That Linda complained about cycling restrictions.)

Mixed-effects models show that three individual variables account significantly for the participant's results on grammatical comprehension: language analytic ability, print exposure and implicit learning. Language analytic ability and print exposure had large effects on grammatical comprehension, while implicit learning had a much smaller effect. These results suggest that there may be more individual differences in native language grammatical proficiency than previously believed. The existence of these individual differences in grammatical knowledge has important theoretical and methodological implications for language research.

These results, and those of other studies, demonstrate the existence of substantial individual differences, undermining the convergence argument for UG. Additionally, the findings challenge another widely-held assumption, namely the claim that the acquisition and processing of L1 grammar rely (almost) entirely on implicit learning. The study suggests that conscious controlled processes (i.e., language analytic ability) also play a role, at least when it comes to relatively complex structures. Furthermore, the study indicates that print exposure is also a strong predictor of grammatical comprehension. This effect can be due to increased exposure to complex syntax in more literate participants, to the processing advantages that the written medium offers to highly skilled readers, or to more indirect effects of literacy such as metalinguistic awareness. These findings have important implications for our understanding of language acquisition, representation, and processing.