Dependency locality matters. But where are dependencies?

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The nature of human working memory predicts *locality effect,* i.e., longer dependencies are more difficult to process. In line with this idea, a large-scale corpus study by [1] shows that dependency length minimization predicts word order in both grammar and usage of more than fifty languages. However, they also noted a correlation such that languages with more head-final dependencies have a longer mean dependency length. Psycholinguistic studies have also observed that verb-final structures are less likely to show a locality effect due to long argument-verb distance. In this talk I will introduce a possible explanation why verb-final structures are relatively insensitive to locality effect, and discuss its implications for the typology of word order.

Psycholinguistic investigations of locality effect have shown mixed results. The general architecture of human working memory (e.g., [2]) predicts that completing a dependency between A and B requires retrieval of A upon the input of B, and that takes more time when A is more distant from B. While some reading experiments indeed observed such effects (e.g., [3]), others did not (e.g., [4,5]). Unexpected results concentrate on verb-final languages such as German, Hindi, and Japanese. Various explanations have been offered for these mixed results ([4–7]). We will see that most of them face empirical problems when the wide range of data in the literature are considered.

One plausible account for the mixed results is that processing of verb-final structures requires retrieval of arguments and related elements before the verb [8,9]. Such pre-verb retrieval would cancel out the degradation of the arguments' representations, mediating the processing difficulty at the verb. [9] argued that pre-verb retrieval of arguments and related heads would be required if argument-verb relations are represented by a constructivist structure, which is popular in generative syntax today [10]. Experimental evidence for pre-verb retrieval is also found [9,11].

This psycholinguistic account has implications for typology of word order. If verbs are the sole pivot of thematic relations that trigger retrieval of arguments, SOV order should generally be more difficult than SVO order because the S-V distance is longer (cf. [1]). But SOV is the most popular word order among world languages [12]. This is no longer a mystery if O in SOV triggers retrieval of S: what matters for processing difficulty is the S-O and O-V distances, but not S-V. In the session we will discuss possible directions for future psycholinguistic, typological, and theoretical studies for deeper understanding of dependencies involved in thematic relations along the line of thought proposed here.

[1] Futrell, et al. 2020. *Language.* [2] Lewis & Vasishth. 2005. *Cog. Sci.* [3] Grodner & Gibson. 2005. *Cog. Sci.* [4] Vasishth & Lewis. 2006. *Language.* [5] Nakatani & Gibson. 2010. *Cog. Sci.* [6] Levy. 2008. *Cognition.* [7] Levy & Keller. 2013. *J. Mem. Lang.* [8] Nakatani. 2021. *IJPCP.* [9] Isono & Hirose. 2022. *HSP2022.* [10] Marantz. 2013. *Lingua.* [11] Isono & Hirose. To appear. *JSLS2022.* [12] Dryer et al. 2013. WALS.