The semantic scope affects the minimal planning unit in sentence production

Before the production of a sentence can be initiated, language users are required to plan at least the first noun from a conceptual up to a phonological/graphematical representation. The minimal syntactic unit of planning has been shown to embrace the first noun phrase (e.g., Martin et al., 2010, 2014; Roeser et al., 2015; Smith and Wheeldon, 1999). Different levels of planning are assumed to vary with respect to their encoding scope (Dell, 1986; Garrett, 1975) such that the message as result of the conceptual processing might have a propositional scope (Bock and Cutting, 1992) while syntactic planning is phrasal but phonological unit of encoding is the word (Griffin, 2001). At least to some degree, these planning stages need to unfold incrementally. Conversely, Lee et al. (2013) found that discontinuous attachment ambiguities are planned along with their head noun indicating that syntactic planning can operate hierarchically such that less effort is required if the production system is permitted to operate incrementally (e.g., Griffin, 2001). However, whether or not hierarchical planning is required would need to be determined by a pre-syntactic operation. The aim of this study is to examine whether the conceptual plan affects the planning effort of the to-be produced syntactic unit. In two image description tasks we controlled the syntactic structure of the target phrases (i.e., head-final and head-initial) but manipulated the semantic scope of determiner ambiguities of phrases such as 'The A's B' meaning either the B and not the C that belongs to the A (wide scope) or the B that belongs to the A and not the B that belongs to the C (narrow scope). Eye movements on the stimulus array and latencies to response onset were recorded as indicators of planning difficulty. We found increased planning difficulty for wide semantic scopes compared to narrow semantic scopes across syntactic structures.

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