

## Diverse mechanisms explain Scalar Diversity

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Scalar Diversity (SD) Effect: When research on scalar inference has looked at scalar expressions beyond the usual quantifiers like ‘some’ and connectives like ‘or’, a consistent finding has been that participants seem more liable to derive a scalar inference in some cases than others (Doran et al. 2009; van Tiel et al. 2016). The main focus of research on SD has been to consider ways in which relations between the scalar term and its Alternative, or sentences containing them, might impact on participants responses. Viewing SD through the prism of exhaustification wrt alternatives explains only a limited amount of variance. In this paper, we will explain how other well-studied pragmatic mechanisms could be involved in explaining SD. In particular, we will look at ways in which apparent scalar inference is derived without exhaustification wrt alternatives. The starting point will be to consider noun phrases containing numerals (‘two children’), which can be understood in a lower-bounded, ‘at least’ mode as well as a doubly-bounded, ‘exactly’ mode (Horn 1992; Geurts 2006 a.o.). While the ambiguity can be understood in terms of scalar implicature/exhaustification, there is reason to question this approach (Horn 1992; Breheny 2008). Recent work (Kennedy 2015; Buccola & Spector 2016) treats numerical expressions like ‘two’ as picking out a degree on a scale of cardinality and derives the ‘exactly’ reading in terms of a Maximality operation. We show that a similar explanation of apparent scalar inference can be applied to most scalar expressions used in van Tiel et al.’s study. We propose that, conceptually, language users may derive apparent scalar inference either through negating a salient alternative (exhaustification) or by relating a scalar term to an underlying degree scale and applying some kind of maximality operation. Our proposal is that expressions used to demonstrate the SD effect differ in the extent to which they are biased to be strengthened via Maximality. We have devised experimental measures which are able to probe this bias and a second strengthening bias pushing up the standard up the scale. In our studies, measures which probe relations of Association and Distinctness between scalar terms and their alternatives, devised by van Tiel et al., can explain around 40% of variance. The addition of our two further measures bring to above 70% the variance explained. In sum, measures motivated by the standard approach (negating Alternatives) and measures related to these other operations not involving exhaustification all significantly explain variance. We conclude from this that there are multiple mechanisms involved in the SD effect and that apparent scalar implicature may be arrived at by more than one route.

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