Quantifier Spreading is not Distributive

Many studies in the last 20 years have sought to explain the phenomenon of quantifier spreading (Philip, 1995; also Brooks et al., 2001; Crain et al., 1996; Drozd, 2001; Guerts, 2001, Roeper, Strauss, & Pearson, 2006, among many others). Shown three girls riding bikes plus an empty bike, and asked, "Is every girl riding a bike?" many children point to the empty bike, saying "no, not this bike." The child appears to be distributing girls to bikes and bikes to girls, and so spreading appears to entail distributivity. Spreading and distributivity have not been distinguished because experimental examples have always engaged both. We argue, rather, that spreading occurs before, and perhaps until, distributivity is recognized and isolated by the child.

In this study, we separated distributivity and spreading as follows. Three picture choices of vases and flowers were presented as follows (Brooks et al., 2001):

- A: Vase-fff V V
- B: Vase-f Vase-f Vase-f V V
- C: Vase-fff Vase-f Vase-ff

A and B both invite spreading with empty vases, but differ on distributivity. C has no opportunity for spreading, and its distributivity is not individual-by-individual, (but might be called "partial distributivity"). Crucially, no scene satisfies both spreading and distributivity, (although that condition was tested separately). Sentence prompts varied *each* and *every* because they differ in both syntax and semantics: *each* is strictly distributive, but *every* permits both distributive and collective readings (Tunstall, 1998).

Forty English-speaking adults and 32 children, ages 6;1 to 8;11, were asked to select the picture or pictures that matched the statements "Every (or each) flower is in a vase," and explain their choices.

Among the adults, predictably, 93% accepted all three scenes for "every flower," but 90% preferred B for "each flower," (although not always exclusively B). Many adults referred specifically to B's distributivity in their explanations.

By contrast, among children, for "every," C was the overwhelming choice, at 88%. Responses for *each* were mixed: 8 preferred A, 9 preferred C, and 4 chose "none." Only 6 preferred the one-to-one distribution in B. Few of the children's explanations for either quantifier mentioned the actual configuration of flowers (for example, [in their words] "all in the same vase is wrong" or "B is a little better because it's spread out.")

One 8-year-old accepted B, but spread the quantifier in her explanation: "<u>each</u> flower is in <u>each</u> vase." Fifteen children specifically rejected A and B because "they don't have flowers in all vases" or "C's the only one with flowers in every vase." By using the quantifier for the distant noun, these responses provide naturalistic data showing spreading for both *each* and *every*.

Thus, these results show that children can apply spreading without distributivity, and they provide a basis for investigating the hypothesis that children cannot impose distributivity until the quantifier ceases to be an operator above all NPs, and becomes a determiner within NPs (Roeper et al., 2006).

(487 words)

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