Quantification with Every: Children's Error Types over Time

In a longitudinal study of 79 4-8-year-olds, we examine four classic errors of universal quantification (Table.1), to assess different claims about their interrelations.

Philip (2012) argues that children's EP-errors are due to a nonadult-like pragmatic restriction of the domain of quantification. The near-symmetry of the visual array makes the "symmetry-spoiler" salient, and an EP-child mistakenly takes the extra object to be relevant. An EP-child is predicted not to make US errors, as the extra element in the US scenarios would also be salient and lead to an adult-like "no" response.

Geurts (2003) claims children sometimes misanalyze *every* as a weak quantifier, whose domain is more flexible:

> (1) Many Scandinavians are Nobel Prize winners (where *many* quantifies over Nobel Prize winners, not Scandinavians)

In his framework, the interpretation of "Every cat has an apple" is as follows:

> (2a) Adult: [x: cat(x)] ⟨∀⟩ [y: apple(y), x has y]
> (2b) Child: […]⟨∀⟩ [x, y: cat(x), apple(y), x has y], where the front brackets contain an open variable for the domain of quantification.

Depending on the salience in context, the child might interpret the sentence as being about cats, or about apples (the EP-error). In his account, EP-errors and US-errors are reflections of the same failure.

Our data reveal that as children start making EP-errors, they display increasing accuracy on the US scenarios ($r(77)= -.665$, $p<.001$). This supports Philip's account, which predicts the negative correlation. However, if the salience of the extra item in each scenario is precisely what leads the child to define the domain of quantification, Geurts arguably makes the same prediction.

The steady increase ($F(1, 78)=57.5$, $p<.001$) in EP-errors from 4-to-8 (Fig.1) contradicts any "shallow" account that attributes such errors to processing limitations.

Roeper, Strauss, and Pearson (2005) found consistent age differences between types of responders, with the US-error group the youngest, then PR, then EP, then adult-like at 8. They take this as evidence for an early, *always*-stage, where *every* is misinterpreted as an event-quantificational adverb, i.e., "Every cat has an apple" would be true *iff* every subevent in the scenario is one in which a cat has an apple. Since the truth conditions for an *always*-type interpretation are not met in either EP or PR scenarios, we might expect PR-children to make coincident EP-errors. The same goes for Geurts, who considers PR a more extreme subset of EP-errors, where the child ignores the object's lexical specificity. Philip predicts the reverse: since there is no near-symmetry in the PR scenarios, EP-children should not make PR-errors.

We find that of 55 EP-children, 33(60%) make coincident PR errors, against Philip's prediction. 37 overall make PR-errors, of which 3 never make EP errors. This is only a slightly higher proportion (8%) than in Roeper et al. (2%).

Roeper et al. argue that children initially take *every* to be inherently distributive, but that EP-errors get resolved when they start permitting collective readings. This prediction is not borne out in our data, which show that the children readily allow collective readings throughout (Fig.2).

(498 words)

Table 1: Does every cat have an apple?

Exhaustive Pairing (EP)	Under-Exhaustive Search (US)	Perfectionist Response (PR)	Distributive-Only Response
Three cats each have an apple, and there is an extra apple. Adult Response: "Yes" A common child error is to answer "no", due to the extra apple.	Three cats each have an apple, and there is an extra cat. Adult Response: "No" An error would be to answer "yes", despite the extra cat that does not have an apple.	Three cats each have an apple, and a bunny has a banana. Adult Response: "Yes" An error would be to answer "no", because of the extra bunny.	Three cats share a single apple. Adult Response: "Yes" An error is to say "no", suggesting the child does not allow a collective reading.

Figure 1: Percent Adult-like Response in Exhaustive Pairing Scenarios

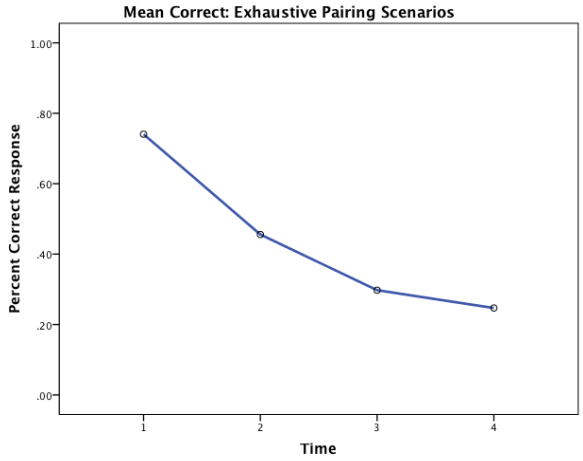
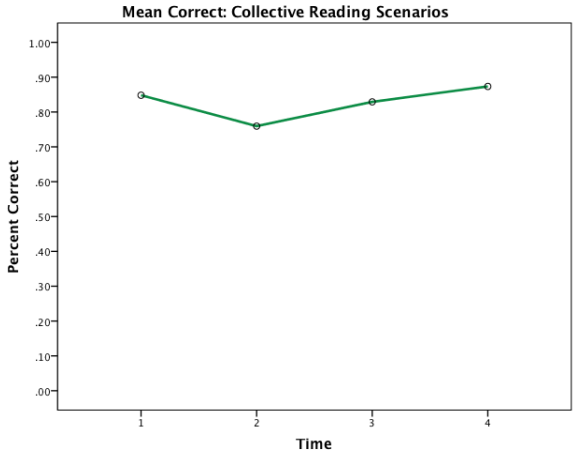


Figure 2: Percent Adult-like Response in Collective Scenarios



References

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