Investigating Context Sensitivity and Vagueness in Nominals in Child and Adult Language

Athulya Aravind (MIT) and Kristen Syrett (Rutgers University – New Brunswick)

Introduction: Previous developmental work has shown that when presented with a display like Figure 1 and asked how many forks there are, children often answer '6', treating each spatiotemporally-delimited entity as a unit for counting (Shipley & Shepperson 1990, Brooks et al. 2013, a.o.). This finding suggests a disconnect in how children and adults represent count nouns and their corresponding sortals. We present novel experimental data from children and adults that instead indicate that the child counting data reveal something about the nature of underlying semantic representations of count nouns that may be masked by extra-linguistic factors. More specifically, our results support the view that (at least some) count nouns are inherently semantically vague, requiring additional, context-specific information to precisify their interpretation. The child-adult difference thus lies not in semantic or conceptual representation, but in the degree to which the two populations are able to recruit relevant extra-linguistic information to restrict a noun's denotation in a given context.

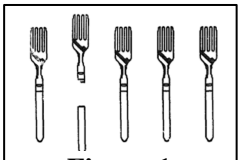


Figure 1

Exp-1 (Counting Task, Adults) was designed to probe the role of linguistic and extra-linguistic context in adults' counting strategies. Participants were shown images of sets of objects via Superlab software, and asked to '*Count the N*!' (e.g., *hammers*, Fig. 2). Four between-subject conditions differed depending on the presence or absence of a relative clause (RC) indicating explicit domain restriction (*'(I am assembling furniture.) Count the hammers (that I can use)!'*) and perceptual properties of the partial objects (e.g. 'natural' break vs. clean split): (A) no RC+natural (n=27), (B) no RC+clean (n=31), (C) RC+natural, (n=29), (D) RC+clean (n=30). We find a main effect of contextual domain restriction, with the presence of the RC leading adults to limit their counts to wholes in (C)/(D) (Fig. 3). In the absence of the RC, counting behavior varied: in (A), adults (like children) counted each partial object separately (>75%) whereas in (B), participants 'fused' the parts of the split object together to count a single whole (>75%). Thus, adults, too, are willing to treat non-whole objects as units for counting, but their counting strategies depend on both linguistic and extra-linguistic context.

Figure 2: Sample Scenes, Experiment 1

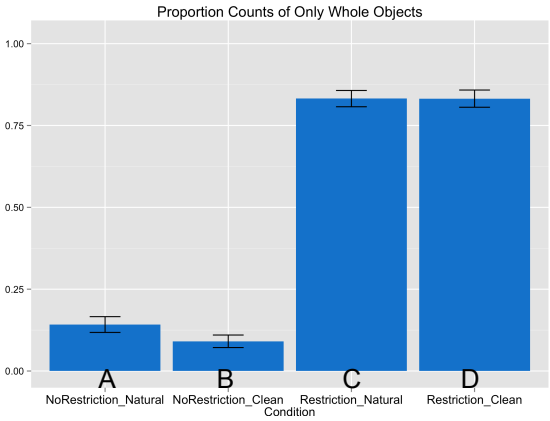
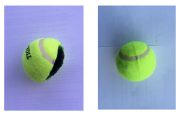


Figure 3: Results, Experiment 1

Exp-2 (Presupposition Assessment Task (Syrett et al. 2010), Adults) was designed to probe the nature of context-dependence exhibited by nominals in a direct comparison to paradigmatic cases of context dependence: Gradable Adjectives (GAs). We ask whether participants treat nominals like **Relative GAs**, shifting the standard of membership based on the context, **Minimum standard GAs**, accepting an object as a category member if it possesses a 'minimal degree of objecthood', or **Maximum Standard GAs**, requiring 'maximality' of objecthood for category membership. In **Exp-2a**, adults were presented with a series of pairs of objects on screen, accompanied by a prompt to '*Find the X (one)!*', triggering presuppositions of existence and uniqueness for the singular definite description. 'X' was either a GA (MIN, MAX, or REL) or an N. Participants accepted the request (selecting L(eft) or R(ight)), or rejected it (space bar). All objects all possessed a non-maximal degree of the property in question, with one object possessing a greater degree of the relevant property than the other. Adults overwhelmingly accepted the request and chose the greater-degree object for REL GAs (>80%), but rejected the request for MIN, MAX and Ns, suggesting that the standard for nominals does not shift automatically, as with REL GAs. In **Exp-2b**, we asked whether participants rejected the request for Ns in Expt-2a for failure of the existence presupposition (like MAX GAs) or because of a failure of the uniqueness presupposition (like MIN GAs).

These three categories were crossed with three types of comparisons between objects (Table 1): (C1) an object with a non-maximal degree of the relevant property and an object without the relevant property, (C2) both objects possessing some (non-maximal) degree (as in Exp-2a), and (C3) both objects possessed some degree of the property, and one maximally so. Rejection rates paralleled MIN GAs and not MAX GAs (Fig. 4): participants rejected requests when both objects possessed some degree of objecthood (C2/C3), even when one object was whole, and accepted requests when only one member of the pair possessed some degree of objecthood (C1), even when it was not whole. Thus, not only *can* partial objects serve as referents for the relevant count noun (consistent with Exp-1), they are construed as such by default in the absence of further contextual information signaling otherwise.

Table 1: Example Pairs of Objects, Experiment 2b

	NP *(tennis ball)*	MAX GA (*full*)	MIN GA (*stained*)
C1			
C2			
C3			

Exp-3 (Referential Task, Children and Adults): To further probe the role of contextual domain restriction in child and adult populations, 44 children (23 boys; 3;3-6;9) and 34 adults were shown scenarios where one character asked a second character (a helper) for an object, and the helper attempted to oblige by retrieving a partial correct, whole correct, or whole incorrect object. There were two conditions: a simple request, or a request accompanied by information about speaker's intention/goal. Participants judged the helper's performance on a ternary scale, assigning a trophy (the helper retrieved what was requested), ribbon (the helper 'kind of' got it), or black cross (the helper did not get it). Adults distinguished partial objects from whole correct and incorrect objects, in both conditions. Older children (>4;6) distinguished between partial and whole correct objects, but only when speaker's goal was explicit (Fig. 5). Thus, while children do not indiscriminately always allow partial objects to serve as referents for count nouns, they are less willing than adults to restrict the noun denotation to wholes in the absence of explicit cues.

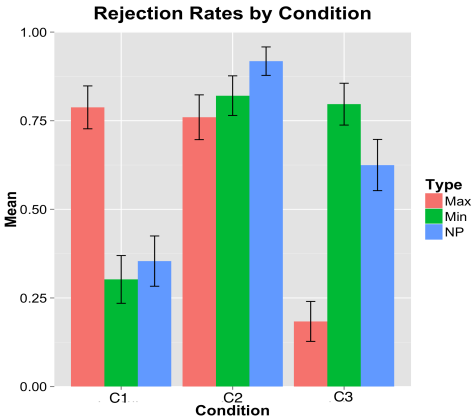


Figure 4: Results, Experiment 2b

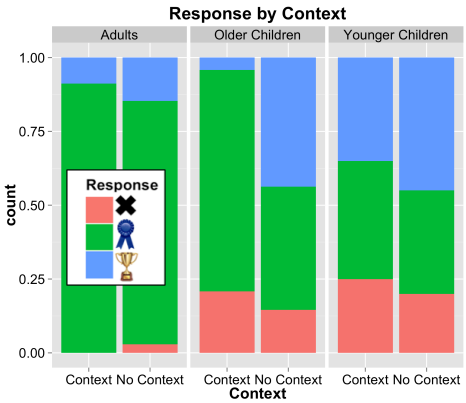


Figure 5: Results (partial object), Experiment 3

Discussion: Our results show that speakers allow entities with some degree of objecthood to fall under the count noun extension by default, suggesting that children's willingness to count partial objects has an empirical foundation. The determination of how to interpret nominals and select a referent does, however, vary by context, which sometimes requires a stricter, whole-object interpretation. We suggest that the 'whole-only' reading requires further restriction of the domain of quantification, be it explicit (as in Exp-1) or implicit (von Fintel 1994, Stanley and Szabo 2000, a.o.). Adults are more willing and able than children to recruit contextual information and world-knowledge to restrict the noun denotation.