Processing exhaustive inferences

Introduction: Although English *only* (1b) and the *it*-cleft (1a) both convey exhaustivity (1d), substantial differences exist with regards to the inference's behavior. One example is that, while exhaustivity is required with *only*, it is not systematic and can be canceled (1e) with the cleft. This observation has led many researchers to argue that the association between the cleft and exhaustivity is a pragmatic phenomenon rather than an entailment (Onea & Beaver, 2009; Horn, 2013; Byram-Washburn *et al.*, 2013; Destruel *et al.*, in press). One area that has generated much debate concerns the processing of pragmatic inferences, and most notably (scalar) implicatures (Degen and Tanenhaus, to appear). Yet, virtually no work has examined the strength and speed of computation of the exhaustive inference (see Denhaus *et al.*, 2011 for ERP study). Thus, this paper seeks to answer two questions: What is the online processing cost of the inference with clefts as compared to exclusives and canonical sentences? Does context influence the ultimate interpretation of the cleft, and if so, how?

Experimental task: Accuracy and reaction times (RTs) were recorded in two sentence-picture verification tasks that tested participants' inferencing behavior in interpretation of *it*-clefts vs. *only* (Exp.1), and vs. canonicals (Exp.2). Forty experimental stimuli (adjective phrase with human subject + transitive verb + inanimate object) were prerecorded with pitch accent on the adjective in three conditions: cleft, exclusive or canonical sentence. Pictures (with four characters) corresponding to the audio stimuli were created in three conditions: W(rong) (i.e. control condition, fig.1), Exh(austive) (fig.2) and Non-exh(austive) (fig.3 and 4). Location of target AdjP was counterbalanced across four positions on the picture. Forty fillers were randomized with the experimental stimuli per participant into 8 lists (Latin square). Participants (n=32, distinct in each experiment) were asked to judge, as fast and accurately as possible, if the sentence heard appropriately described the displayed scene by pressing a 'True' or 'False' button.

Results: *Accuracy*: Speakers reject the cleft more often in non-exhaustive contexts when the competitor form is an exclusive (proportion of "False" judgments is 46% in Exp.1 vs. 34% in Exp.2). Moreover, consistent with recent studies, the cleft is compatible with non-exhaustive situations ("True" judgments are significantly above chance in both experiments). *RTs*: Significantly higher in the Non-exh condition for cleft vs. *only* ($p < .05$, Fig.5), and cleft vs. SVO ($p < .05$, Fig.6). No additional interactions between Sentence type and picture were significant. Interestingly, when comparing the cleft's RTs in the non-exhaustive condition, speakers are slightly slower to reject than accept it, suggesting that the exhaustive inference is slower to arise when not supported by the context.

Discussion: The experiments provide further evidence for pragmatic approaches to exhaustivity, suggesting that the inference is not part of the asserted content of a cleft. We explain the results above by arguing that the cleft is in fact systematically ambiguous and that the exhaustive inference is derived more frequently in cases when there is enough support from the context to do so.

1. Examples:

(1) a. It's a [BLOND]$_{foc}$ baby who is shaking a rattle.
b. Only a [BLOND]$_{foc}$ baby is shaking a rattle.
c. A [BLOND]$_{foc}$ baby is shaking a rattle.
d. $\rightsquigarrow$ *No other baby is shaking a rattle.*
e. ... Yes, but a [BROWN]$_{foc}$ baby is also shaking a rattle.

2. Sample of pictorial stimuli:

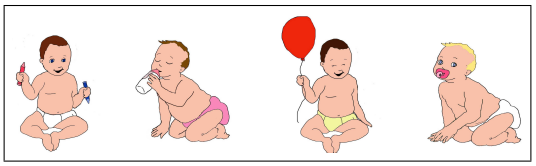

Figure 1: Wrong condition

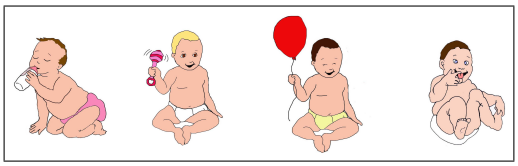

Figure 2: Exhaustive condition

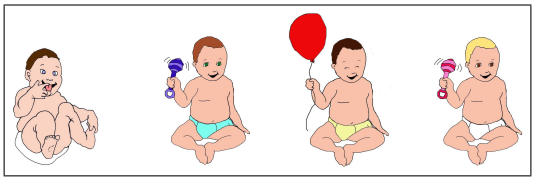

Figure 3: Non-exh (2) condition

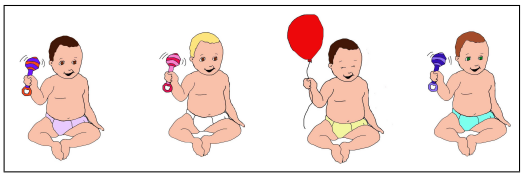

Figure 4: Non-exh (3) condition

3. Results:

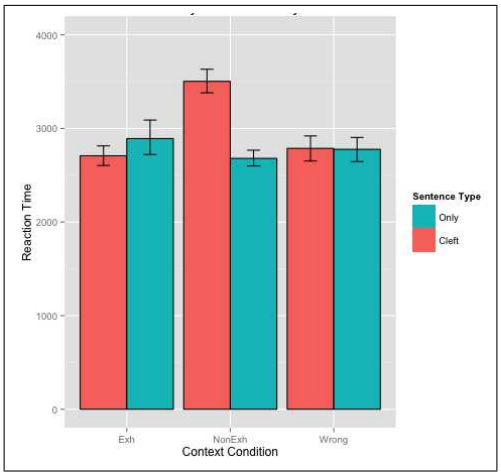

Figure 5: Study 1, Cleft vs. Only

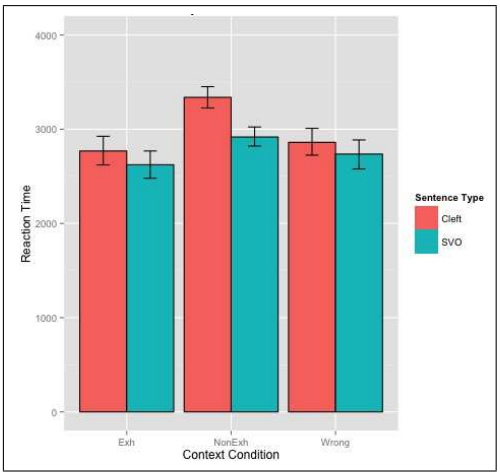

Figure 6: Study 2, Cleft vs. SVO

4. Selected references: Byram Washburn, M., Kaiser, E., and Zubizarreta, M. (2013). The Linguistic Society of America.• Hedberg, N. (2000). Language, 76. • Horn, L. R. (1981). In V. Burke, & J. Pustejovsky (eds.), Papers from the 11th Annual Meeting of NELS. • Kiss, K. E. (1998). Language. • Krifka, M. (2008). Acta Linguistica Hungarica, 55.