

## **The cognitive costs and benefits of encoding and interpreting colour adjectives**

Euro-XPrag: Collaborative research proposal

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### **Background**

At the end of 2008, we ran a pilot for a developmental study investigating children's use of referential descriptions, in particular the issue of under-informativity. Children (n=17) were shown a booklet with paper dolls and were asked to help an experimenter choose the clothes that she needed in order to make her own paper dolls look like the ones in the booklet. All the paper dolls in the booklet were wearing 3 garments (e.g. a hat, a dress and a pair of shoes) and children had to ask a second experimenter for each one of the garments. The second experimenter was standing next to a display of clothes placed up on a board. Each display included 4 garments and children had to request the one that matched the paper doll in the booklet.

The difficulty of the task progressively increased and then decreased, so a simple request for 'the hat', for example, would have been informative enough during the first set of trials, yet children needed to ask for 'the blue dress' or 'the red boots with a star' later on in the task. Like the first set of trials, the last set did not require any description of the garment in question. The point of this design was to investigate whether children in training studies simply learn to be more verbose in their requests, or whether they appreciate that they need to be informative enough to successfully communicate (see Matthews, D. E., Lieven, E., & Tomasello, M. (2007). How Toddlers and Preschoolers Learn to Uniquely Identify Referents for Others: A Training Study. *Child Development*, 78(6), 1744-1759). If children in our study learned to be informative rather than verbose during the experiment, they should produce simple referring expressions in the final trials of the study (e.g. 'the hat'), even though they would have had to use more complex referring expressions in previous trials. In order to control for the possibility that children might have continued using complex descriptions because of a carryover effect, we included an adult control group (n=17).

The youngest children in the pilot (3 year-olds), performed optimally in the first and last sets of trials but were under-informative in the intermediate, more difficult trials, so the second experimenter would often have to ask for further information (e.g. 'Which hat do you want? Look, there are two hats'). In contrast, the older children (4 year-olds) were over-informative in the first and last sets of trials of the experiment, using colour terms redundantly (e.g. asking for 'the pink hat' when there was only one hat in the display). Interestingly, 100% of the adults in the control group also used colour terms redundantly in the first and last sets of trials. This is particularly surprising if we take into account that the nursery staff who accompanied the children during the task realized the point of the study (with children having to make more and more elaborate descriptions as the study progressed) without needing any explanation from the experimenters. It is therefore surprising that adult participants in the

study were not only over-informative at the beginning but also continued to use colour adjectives redundantly at the end of the experiment. If they had not realized that they didn't need to mention the colour of the garment in the first set of trials, one might assume that this would become clearer after seeing in subsequent displays that there were 2 and 4 items of the same category rather than only 1. However, adults were equally over-informative in their use of colours in the first and last sets of trials.

One possibility is that older children and adults used colour adjectives redundantly because they were describing clothes. However, in a recent eye-tracking study that included a production task where participants had to select 1 of 4 geometrical figures, adult participants often used colour adjectives redundantly in their requests. In view of these unexpected results, we decided to investigate the cognitive costs and benefits of encoding and interpreting colour adjectives. In particular, we became interested in testing the hypothesis that, because of the perceptual salience of colour, encoding colour adjectives might be cognitively cheaper in certain contexts than attending to higher-level informativity constraints (i.e. determining whether a colour adjective would be informative or redundant in a certain context).

This is an important question since one of the tenets of Gricean pragmatics is that interpreters assume that their interlocutors are observing the Maxim of Quantity (*Do not make your contribution more informative than required*). Likewise, in Sperber and Wilson's Relevance Theory, the ratio Cognitive Effects / Processing Costs determines the relevance of a given interpretation. However, it is possible that, from the speaker's perspective, the choice of an expression might also need to strike a balance between cognitive costs and effects. The use of colour adjectives in particular – and more specifically in the context of asking for an item in an array – might be determined not only by informativity constraints but also by the salience and the reliability of colour cues in the given context.