You are "the only one"…how far do we go in search for referents?

Background. Crain, Ni and Conway (1994) found that children and adults adopt different parsing strategies when interpreting ambiguous sentences like (1) *The big elephant is the only one that is playing guitar* in a situation S in which there are different animals (e.g. three elephants, an octopus and a bird), some of which are playing a guitar (e.g., the big elephant, the octopus and the bird). The ambiguity relates to the fact that one might substitute "the only (one)" with either (a) the only thing/animal or (b) the only elephant. Crucially, the sentence is false substituting "the only one" with "the only animal", given that, in addition to the big elephant, there are other animals that are playing the guitar in S; conversely, it is true substituting "the only one" with "the only elephant", given that, among the elephants, the big one is the only guitarist. By means of a Truth Value Judgment Task, Crain & al. found that adults accepted (1) in the situation described while children rejected it. They interpreted this result in terms of a difference in parsing strategies between adults and children: the claim is that the adult's parser is guided by a strategy of "minimal commitment", which prefers the interpretation that has more chances of being true (i.e. (b)) to avoid costly and unnecessary commitments. On the contrary, children seem to adopt a strategy of "maximal commitment", making the strongest assumptions to solve a "*learnability* problem".

Our study. Our study focuses on adults, with the aim of testing Crain & al.'s claim by means of on-line measures of the strategy adopted by adults in solving the ambiguity associated to "the only one". To this purpose, we recorded the eye-movements of 29 Italian adults while processing Italian sentences of the form "the Noun Adj is the only one that VP" in situations in which the sentence was true under a "minimal commitment strategy" and false under a "maximal commitment strategy". We used a Visual World Paradigm on an Eye Link 1000. Participants heard sentences and had to evaluate them as "true" or "false" by pressing a button with respect to a scenario shown on the display screen. For example, the critical sentence (2) "Il triangolo grande è l'unico che gioca a tennis" [The big triangle is the only one that is playing tennis] was heard in the scenario depicted in Fig. 1, that makes the interpretation *the big triangle is the only triangle playing tennis* (maximal commitment) true but makes *the big triangle is the only thing playing tennis* (minimal commitment) false. We compared the performance on critical trials (30) with the performance on unambiguos control trials (36 overall, 18 false/18 true). Crucially, controls varied w.r.t. the type of "strategy" required to evaluate them: some required the exploration of the whole scenario in order to be properly evaluated (maximal); some required the exploration of one of the four quadrants only, the one depicting the relevant set (minimal). For example, to evaluate (3) "All the yellow numbers are kings" as "true", one needs to check all the yellow items in the scenario (more than one, and dispersed in more than one quadrant) to make sure that all of them are kings, thus adopting the strategy "maximal"; to evaluate (5) "Three crosses are playing football" as "true" or "false" it suffices to check thoroughly only the quadrant that contains crosses (unique), thus adopting the strategy "minimal". *Results.* Indirect and direct measures of processing will be considered in the analysis: truth value judgments (true/false), reaction times and fixations paradigms. As for the Truth Value Judgment: participants performed at ceiling on controls but they overwhelmingly rejected the critical "ambiguous" sentences (above 90% of rejections), contrary to Crain et al.'s results. In our study, the strategy adopted by the adults seems to be a "maximal commitment" one: adults did not turn out to be charitable or parsimonious, but prefer the "strongest" interpretation, the one that makes the ambiguous sentence "false". However a fine grained analysis of the on-line data revealed more insights on the strategy adopted which could not be measured in the original study. Mixed-effects models were employed (Baayen et al., 2008) using R, with crossed random effects for subjects and items. We will focus here only on some effects. As for RTs (Fig.2A): the critical sentences were not

different from the controls that required an exploration of the whole scenario (maximal), pMCMC=.7772, but were significantly higher than the RTs of the controls that required a localized exploration of the scenario (minimal), pMCMC=.0001. Interestingly, though, the pattern of exploration for the critical sentences (as revealed by the number of fixations, Fig. 2B, and the mean number of interest areas explored (out of 4), Fig. 2C) turned out to be different both from that of the controls requiring an exploration of "all" quadrants (maximal), pMCMC=.0012, and from that of the controls requiring an exploration of "one" quadrant only (minimal), pMCMC=.0001. Thus, participants took the same time to make a decision in case of the critical ambiguous sentences and controls that required an exploration of the whole scenario, and this did not depend on the fact that they always answered "false" to critical trials (in fact, subjects were slower when answering to true-controls than when answering to false-controls, pMCMC=.0006); they explored less quadrants and made less but longer fixations. Our interpretation of these data is that, in case of critical ambiguous sentences, adults finally conformed to the "maximal commitment" strategy that Crain et al. found in children: they looked for the "counterexample". Interestingly, though, the fact that they took the same time to answer to critical trials than they took to evaluate the controls that required a larger exploration of the scenario (in terms of explored quadrants, cf. Fig. 2C) might indicate that they were processing the ambiguity of "the only one" and were in fact considering an alternative strategy before moving to their final decision.

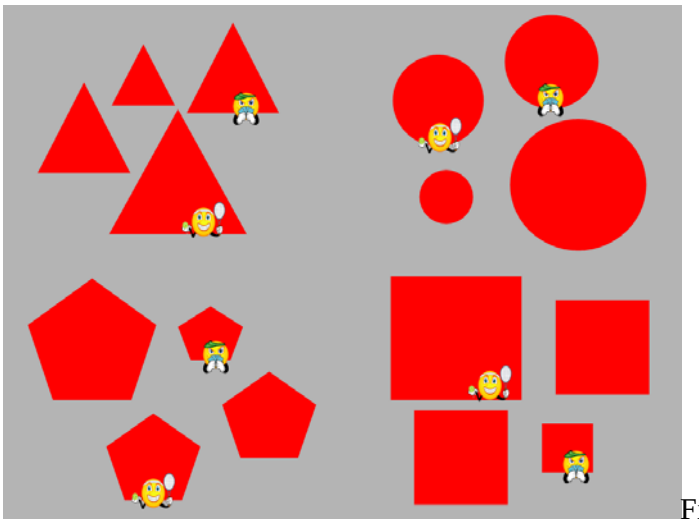

Fig. 1

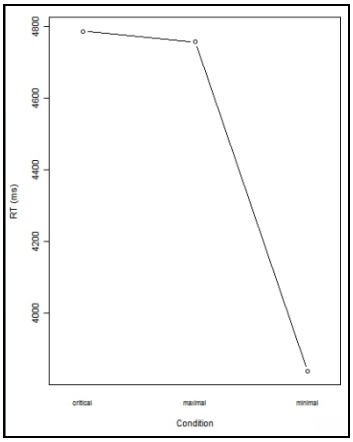

Fig. 2A

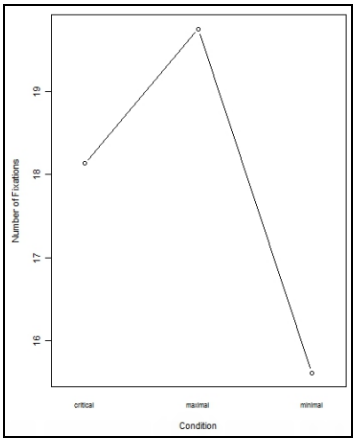

Fig. 2B

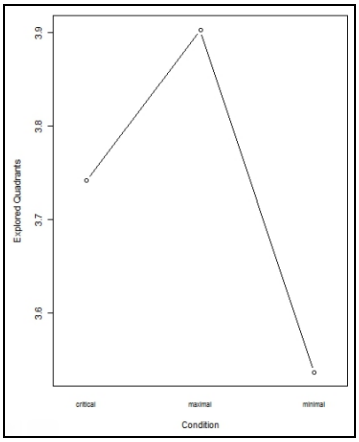

Fig. 2C