

Grammatical knowledge predicts accuracy on an irony comprehension task.

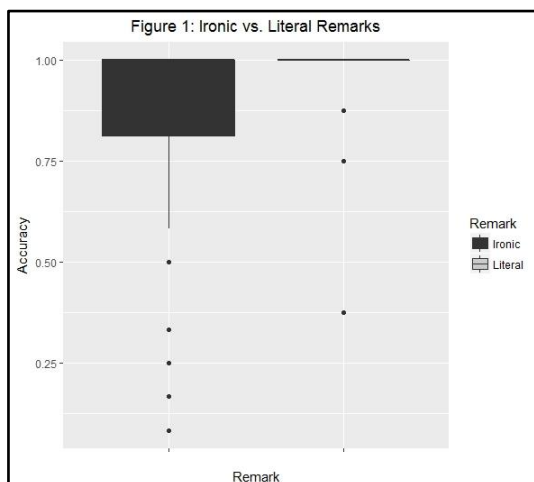
Beatrice Giustolisi & Francesca Panzeri

University of Milano – Bicocca

1. Introduction. Irony comprehension requires the speaker to understand that a false statement is uttered not to deceive the listener, but to joke, i.e. to be ironic. Understanding irony is thus a complex skill that emerges quite late, at about age 6 (Ackerman 1983). Firstly, children acquire the comprehension of positive remarks in negative situations (ironic criticisms), and subsequently the comprehension of negative remarks in positive situations (ironic compliments) (Harris & Pexman 2003). According to some scholars, irony comprehension is linked to 2nd order theory of mind (ToM) abilities, in atypical populations (e.g. children with autistic spectrum disorder, Happé 1993) and in typical developing (TD) populations (Sullivan et al. 1995). Specifically, the ability to conceptualize 2nd order ignorance has been proposed as a prerequisite to tell a lie from a joke, i.e. to understand irony.

The long-term project we are working on is to further explore the relation between ToM abilities and irony comprehension in several atypical developing populations and to create ad-hoc supporting materials for those who need them. In order to set up effective instruments for assessing and improving irony comprehension, it is first necessary to i) delineate the developmental trajectory in TD children and ii) highlight which factors are better predictors of this complex skill. Considering that performance on ToM tasks is highly dependent on language abilities (Happé 1995 and Astington & Jenkins 1999), it is our particular interest to test which (if any) linguistic ability is a good predictor of irony comprehension. This is the topic of the here reported study.

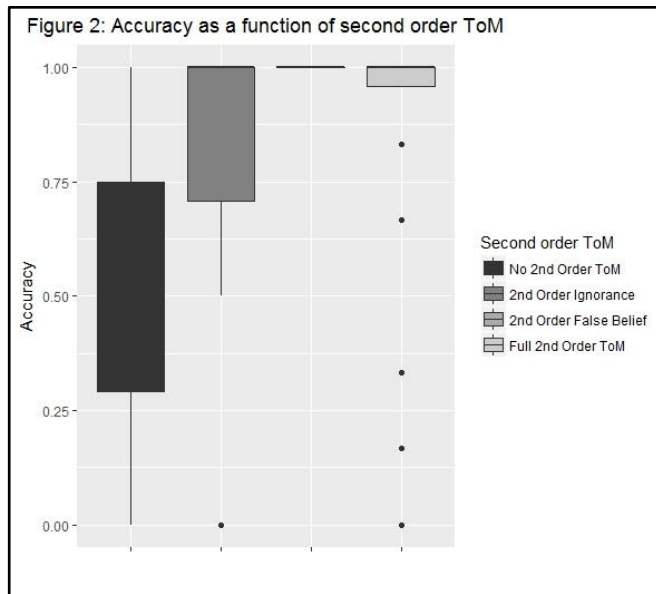
2. Methods. Participants were 56 TD children from the I to the III class (25 F, 31 M; Age: M=7y,10m; range= 6y,5m – 9y,4m.). All had normal IQ and passed the 1st order ToM Smarties task. To assess 2nd order ToM (both 2nd order false belief and 2nd order false ignorance) we used a revised version of the “*birthday puppy task*” (Sullivan et al. 1994). As linguistic assessment, we used lexical and grammatical comprehension tasks of the battery BVL 4-12 (Marini et al. 2015). The irony task included 10 stories introducing a situation and concluding with a remark, literal (4, controls) or ironic (6). Comments could be compliments (5) or criticisms (5). Children were asked three questions about i) context (control), ii) understanding of speaker’s meaning; iii) recognition of speaker’s attitude. Target items were therefore three ironic criticisms and three ironic compliments.



3. Results. Accuracy on questions ii) and iii) was analyzed using mixed logit models (Jaeger 2008). In each analysis, subjects and items were added as random factors.

Participants responded correctly to 97.54% of questions on literal comments and to 83.63% of question on ironic comments (Figure 1). The difference was significant ($p < .001$).

Ironic stories were further analyzed testing the difference between ironic compliments and ironic criticism, the effects of having or not 2nd order ToM and the influence of linguistic knowledge.



As expected, performance on ironic criticisms was better than on ironic compliments (91.40% (SD= 28.11) accuracy vs. 80.64% (SD= 39.61) accuracy). Considering 2nd order ToM, participants who failed both on 2nd order false belief and 2nd order false ignorance had the lowest scores (Figure 2). Nevertheless, the best predictors of accuracy were type of irony (i.e. criticisms vs compliments: $\beta=1.788$, $SE=0.664$, $z=2.695$, $p<.01$) and BVL grammar score ($\beta=3.698$, $SE=1.881$, $z=1.966$, $p=.04$).

4. Discussion. Contrary to previous findings (Sullivan et al. 1995), we did not find a direct relationship between 2nd order ToM

and irony comprehension. On the contrary, the best predictor of irony comprehension was linguistic comprehension, specifically grammatical skills. Our results are in accordance to the hypothesis that linguistic competence might constitute a better predictor for figurative language comprehension (Norbury 2005), especially considering TD children. This statement should not be astonishing, considering that the link between first order ToM development and language development is not reciprocal, and specifically it is language development that constitutes a foundation for ToM development, and not vice-versa (Astington & Jenkins 1999).

We propose that structural language skills are the strongest building block for irony acquisition (and for figurative language acquisition in general). The relation between language abilities and irony is surely mediated by ToM, but the core component for irony comprehension development should reside on linguistic skills. Further research is needed to identify the key structural features that sustain the development of irony comprehension.

References.

- Ackerman, B.P. 1983. Form and function in children's understanding of ironic utterances. *Journal of Experimental Child Psychology*, 35.
- Astington, J.W., & Jenkins J.M. 1999. A longitudinal study of the relation between language and theory-of-mind development. *Developmental Psychology*, 35.
- Happé, F.G.E. 1993. Communicative competence and theory of mind in autism: A test of relevance theory. *Cognition*, 48.
- Happé, F.G.E. 1995. The role of age and verbal ability in the theory of mind task performance of subjects with autism. *Child Development*, 66.
- Harris, M., & Pexman, P.M. (2003). Children's perceptions of the social functions of verbal irony. *Discourse Processes*, 36.
- Jaeger, T.F. 2008. Categorical data analysis: Away from ANOVAs (transformation or not) and towards logit mixed models. *Journal of Memory and Language*, 59.
- Marini, A., et al. 2015. *Batteria per la Valutazione del Linguaggio in Bambini dai 4 ai 12 anni*. Giunti O.S..

Norbury, C.F. 2005. The relationship between theory of mind and metaphor: Evidence from children with language impairment and autistic spectrum disorder. *British Journal of Developmental Psychology*, 23.

Sullivan, K., Zaitchick, D., Tager-Flusberg, H. 1994. Preschooler can attribute second order false belief. *Developmental Psychology*, 30.

Sullivan, K., Winner, E., & Hopfield, N. 1995. How children tell a lie from a joke: The role of second-order mental state attributions. *British Journal of Developmental Psychology*, 13.