Contextual Awareness in Pragmatic Meaning Construction – An Experimental Study

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Abstract: Our experimental pragmatic study explores the role of contextual cues in children's understanding of non-compositional figurative utterances and explain why context awareness facilitates non-compositional meaning construction at an early age. We investigate preschoolers' linguistic performance where the pragmatic trials are viewed in relation to children's mentalization skills: their ability to understand intentions and desires attributed to the self and others. We have found that contextual effects may vary according to what they address, and that the successful deciphering of implicit meaning (in our irony trial) is significantly influenced by contextual cues that target the mental state of the speaker, whereas regular linguistic context (in our idiomaticity condition) facilitates non-compositional understanding only moderately, at the level of tendentious correlation. Besides testing the effect of context within modalities (contextualized vs decontextualized utterances in the verbal modality), we also investigate the effect of context between two different modalities in the verbal vs. non-verbal domains (in our verbal vs. visual humor task). Our findings confirm results in developmental research that surface cues help in the recognition of communicative intent (Csibra 2010), in finding optimal relevance (Sperber-Wilson 1986) and contribute to the successful resolution of the intended meaning at hand (Schnell 2019), and that contextual effects may vary according to the nature of the cues available whether they affect mental state recognition or not.

Keywords: social cognition, context awareness, surface cues, pragmatic meaning construction

1. Background - Social cognition as the cornerstone of pragmatic meaning construction

Pragmatics investigates language in context; it targets meaning construction and its cognitive processes, in a dominantly linguistic framework. The present study stems from a linguistic and cognitive approach, investigating the mental strategies crucial in the understanding of non-compositional constructions like metaphor, humor and irony.

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The study sets out to discover how non-literal meaning construction is different, what cognitive prerequisites account for the ease with which we interpret such figurative utterances, and how context influences the success of interpretation by triggering different inferential mechanisms in deciphering intended meaning, through the identification of the intention of the speaker. This change of perspectives takes place automatically in healthy, neurotypically developing individuals, but is problematic in neuropsychiatric disorders that have deficient social cognition in their symptomatology, therefore, an inadequacy of the mindreading ability. Mindreading is the ability where listeners can identify the intention of the speaker and thus infer the intended, speaker's meaning in the framework of a cooperative stance as Paul Grice, one of the most significant language philosophers in the history of pragmatics pointed out (Grice 1957, 1975).

Deidre Wilson (2009) pointed out that there is now lot of evidence from developmental and neuropsychological literature that performance on pragmatic tasks correlates with performance on different orders of standard False Belief Test. In our study we test mentalization ability of preschoolers with an unseen displacement task named False Belief Task (FBT) in which the subject has to be able to change perspectives and see the situation at hand from the protagonist's point of view, integrating several aspects of the situation that is only represented in the subject's mind about other people's mental states, thus representations. In other words, the False Belief Test examines subjects' ability for metarepresentation, to read others' intentions and to use this to predict their behavior, in order to infer the intended meaning in a given context.

The interpretation of non-compositional constructions is a multi-level interactive process of several simultaneous levels in the psychological (mental, inferential), social-cognitive (mindreading- based) and linguistic (verbal) levels. Pragmatic processing involves *top-down* processes (background knowledge, intention reading, situational and contextual cues, inferences) (Fig. 1). Therefore, meaning construction in social settings is, by nature linked to social-cognition (Astington-Jenkins 1999). In today's psycholinguistics this central cognitive mechanism is known as Theory of Mind (ToM). Such cognitive strategies account for the ease with which we interpret non-literal meaning and constructions (Raskin 1985, Gibbs 1994, Bergen-Binsted 2004).

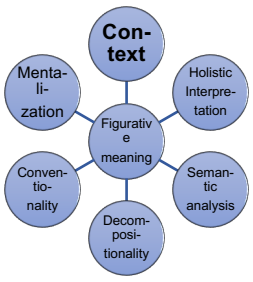


Figure 1. Pragmatic meaning construction is a holistic process

Theory of mind, also known as mentalization is the cornerstone of inferential meaning construction. In our experimental pragmatic study we test preschoolers' ability to change perspectives (with a False Belief Test) to make conclusions about

the inferential mechanisms we use in mundane discourse and communication, to decipher speaker's intentions in order to infer the intended meaning of an utterance.

Importantly, what the standard 1st order FBT directly reveals is not the general state of mindreading ability (it's been present all along (cf. figure 2), but the current state of development of the Application level of mindreading (Sperber 2000-metalogic, Mascaro-Sperber 2009, Schnell 2007, 2012, 2015, 2019).

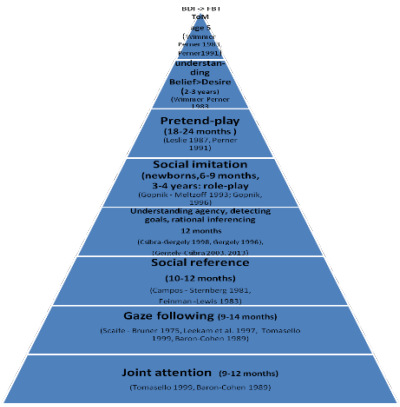


Figure 2. The levels of mindreading as a continuum of social cognitive abilities

2. Method

The purpose of the study is to map the relationship of theory of mind and pragmatic competence and identify the effect of the different types of contexts. We define mentalization or Theory of Mind (ToM) as the ability to attribute mental states (i.e. desires, beliefs and intentions to others). The empirical investigation targets the interpretation of linguistic utterances like metaphor, humor, and irony-understanding. In each linguistic test there were 5-5 tasks, a quantitative evaluation was used in which each correct answer ensured a score of 1 point. The same subjects are tested on different aspects of pragmatic competence in our coherent empirical framework and comparative methodology. Our Theory of Mind test was based on unseen displacement, using the Sally-Anne test (Baron-C-Leslie-Frith 1985) in the form of a puppet play. Subjects composed of 45 preschoolers, age ranging from 3;7 – 7;3, 19 boys, 26 girls, of normal IQ, and representative sociocultural background. Tasks included a Theory of Mind (ToM) question (*Where will Sally look for her ball?*) and two control questions: Memory- and Reality Control questions. A second order ToM question investigated answers to the question: *Where does B think A will look for the ball?* (Baron-Cohen 1995 Fig. 3).

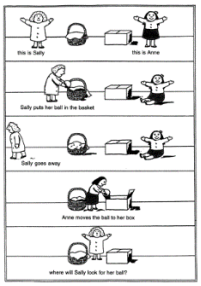


Figure 3. The Sally-Anne False-Belief Test (FBT)

Children who passed were put in the ToM group (having a theory of mind sufficient to pass the False Belief Test (FBT), whereas those who failed were named No-ToM group, meaning, they had theory of mind skills that were not fully fledged to reach the level of the FBT (see Fig. 2 above). (NoToM mean age: 4;8, ToM mean age: 5;6).

Subjects' results in the pragmatic tasks (Metaphor, Humor, Irony) were compared between the two groups, in view of their mentalization skills, to conclude if ToM is key in having pragmatic competence. Statistical Analysis was based on Mixed way ANOVA, Spearman's correlations, and Mann Whitney U tests. Variables were age and the pragmatic trials. We investigated the effect of context in the different domains and modalities of pragmatic interpretation.

In the idiomaticity condition we had a Simile vs Metaphor trial, testing both production and comprehension with decontextualized (production) and contextual (comprehension) stimuli.

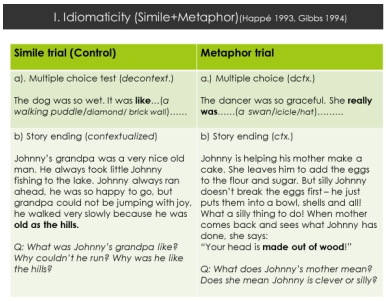
Test material, tasks:

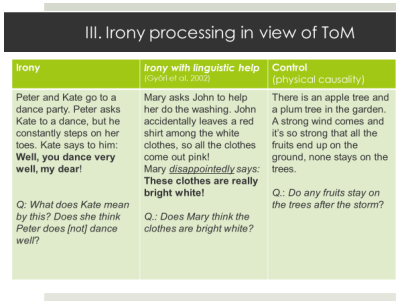
Simile: In this condition the comparison is made explicit by the word "like" therefore, semantic interpretation suffices in order to decipher intended meaning.

Metaphor is by nature implicit, so we hypothesize ToM skills are crucial in deciphering metaphorical meaning, and therefore we expect the ToM group to be significantly more successful in the metaphor condition, while both the ToM and no ToM groups to be equally successful in the semantic i.e. simile interpretation.

Humor tasks are composed of two decontextualized humor trials (Riddles and "Jean the servant" jokes), besides the contextualized condition based on classic jokes with a punchline. We also investigated non-verbal, jokes in the visual modality.

In the Irony task we used short scenarios with ironic target sentences. In the Irony with linguistic help condition tasks were based on ironic utterances with a surface cue making the mental state of the speaker explicit (Kate *angrily* said: "You are a great friend!"). In the Irony Control condition we used scenarios of the same length and same syntactic complexity, but without human agents, hence no speaker's mental states to be deciphered in interpretation. See tasks below.





2.1. Investigation of contextual effects

In the idiomaticity / metaphor trial we tested decontextualized and contextual metaphorical expressions and their interpretation to see the effect of context on pragmatic meaning construction.

In the humor trial we looked at the effect of context in the sense that it is visual modality, how visual modality as a context influenced interpretation compared to verbal modality.

In the irony trial we looked at the effect of interpersonal context targeting speaker's mental state vs. context without agents. We hypothesized that in tasks where the mental state of the speaker was made explicit, the utterance required only semantic interpretation, so we expected the difference between the performance of the two groups to disappear.

3. Results

3.1. Simile vs. metaphor results in view of mentalization

Our findings confirm that Theory of Mind skills significantly improved metaphor comprehension, whereas in the simile condition for which semantic interpretation suffices, there was no significant difference in the performance of the two groups (Figure 4). The ToM group was significantly more successful in the metaphor condition (Mixed way ANOVA): than the NoToM group: ($F(1,43)=134$, $p_{metaphor}<0,01$); Simile n.s. ($F(1,43)=0,5$, $p_{simile}>0,05$). See Fig. 4.

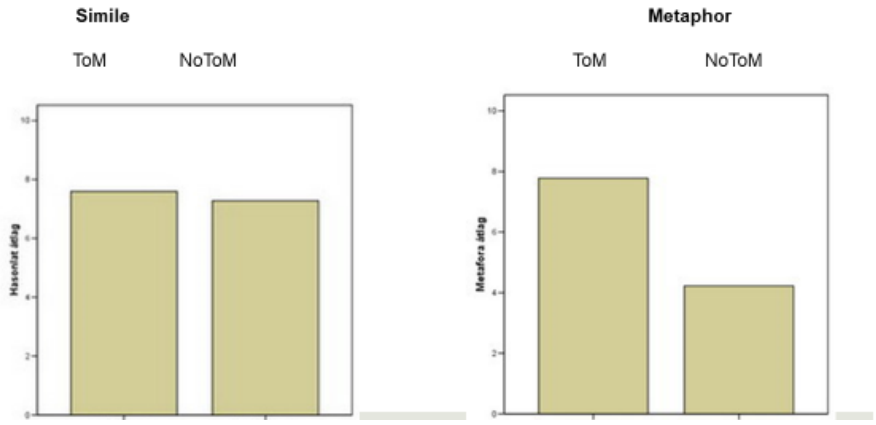


Fig. 4 Metaphor processing in view of Theory of Mind (ToM) mentalization skills

Contextual effects in idiomatic interpretation

We tested the pragmatic competence of preschoolers with decontextualized and contextualized simile and metaphor tasks. Results confirm the facilitating effect of context in interpretation in general, and in the comprehension of implicit meaning in particular (see Fig 5). This facilitating effect, however, remains at the level of tendentious correlation, as context was regular linguistic context in the form of longer stories, not specifically targeting the mental state of the speaker as in the irony condition. Apparently, there is a tendency but not significant effect of such regular context facilitating interpretation of metaphorical utterances (n.s. F(1,41)=0,228 n.s).

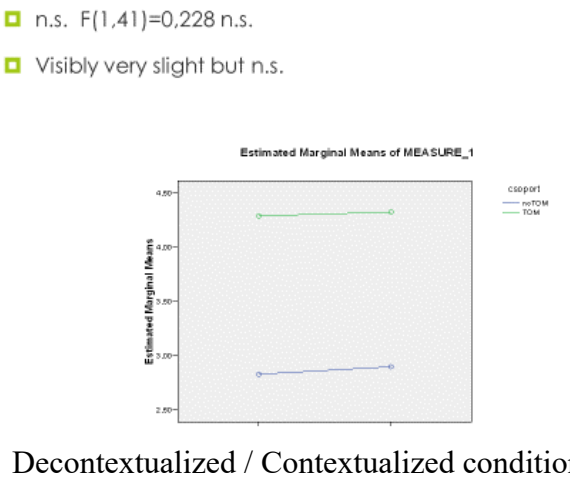


Figure 5. Context facilitating interpretation in idiomatic meaning construction

The children who passed our FBT testing ToM skills (ToM group), i.e. having mentalization skills at the level of explicit reasoning, is marked with green in the charts, whereas the group of kids without the FBT level of mentalization (NoToM group) are marked with blue.

3.2. Humor results in view of mentalization

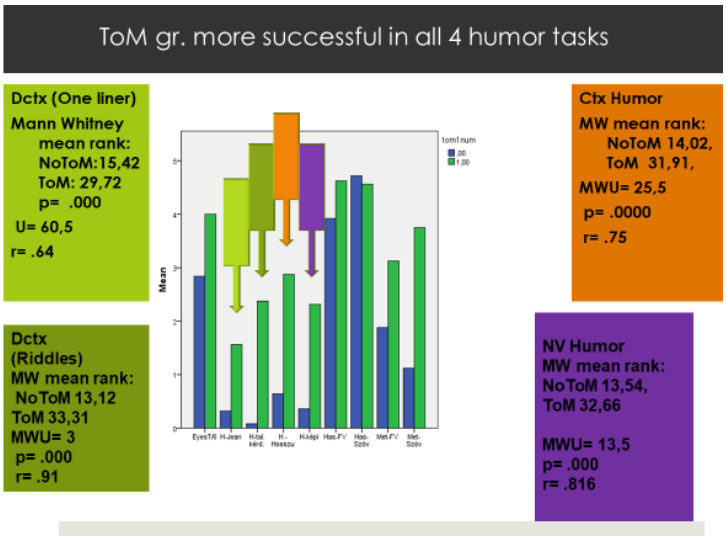


Figure 6. Theory of Mind (ToM) made a significant difference in all four humor tasks.

Contextual effects (visual vs. verbal modality) in the Humor condition

Context facilitated interpretation in the humor condition in the verbal domain. In the comparison of visual vs. verbal modality results are seemingly controversial: visual modality was least enjoyed by those subjects who passed ToM test and had fluent verbal skills, whereas it was most enjoyable and easiest for the NoToM group. This may be explained by the Principle of Cognitive Congruency (Zigler-Levine-Gould 1966) stating that the most satisfying stimulus is the one that is congruent with the child's cognitive complexity. This explains why NoToM children enjoyed non-verbal jokes the most whereas ToM group subjects preferred this trial the least.

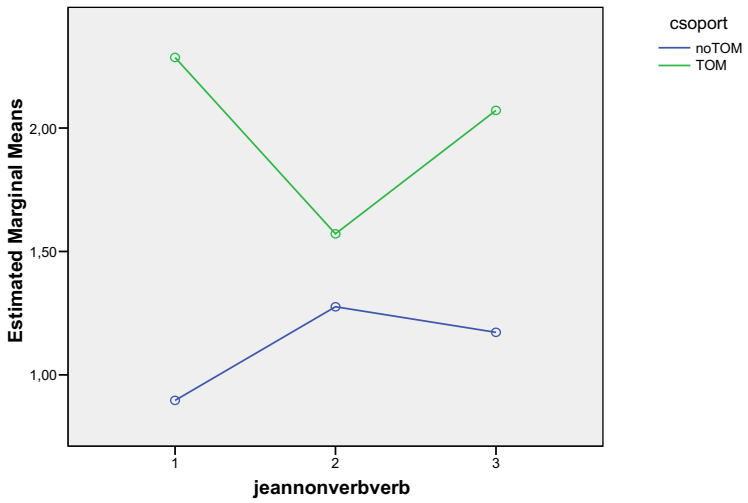


Figure 7. Effect of context: verbality and also modality influences interpretation

Effect of context n.s. within groups F=(2,82)= 0,416; n.s., remains at a level of tendentious interaction: F(2,82)=2,711, p<0,1. Contextual effects are more pronounced within modalities of visual vs. verbal context: ToM group performed better in verbal tasks (see also: Győri et al. 2007). Irrespective of tasks there is a significant difference in the performance of the two groups F(1,41)=7,612, p<0,01. Hence it is ToM, social-cognitive skills that causes the difference in results, not type of task.

3.3. Irony results in view of mentalization

Our target sentences in the irony condition were instances of conversational irony based on hyperbole. In the irony (see Fig. 8.) (I) condition the ToM group performed significantly better (Mann-Whitney U=115,5 p<0,01, r= .36), confirming the key role of mentalization in successful irony comprehension. Results confirmed that in the Irony with linguistic help (IH) condition surface cues facilitated interpretation of mental states and thus ironic intended meaning (n.s. Mann-W.U= 150 p= .104, r= .25) proving that context making speakers' mental states explicit significantly aids comprehension of intended meaning, and that semantic interpretation suffices for the condition where mental states are made explicit. The Control (C) condition was based on the same verbal scenario but without human agents, hence no ToM skills were required. Results confirmed that there is no significant difference in the performance of the NoToM and the ToM group (Fig. 8) in the control condition: (C) Irony Control: n.s. MWU=186, p= .664, r= .067.

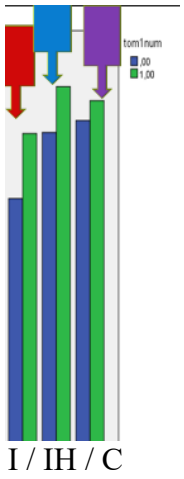


Fig. 8. Irony results in view of social-cognitive skills

Contextual effects in the irony trial

In the IH trial the mental state of the speaker were made explicit, which caused the difference in the results of the two groups to disappear: hence those without fully fledged mentalization skills were equally able to understand meaning as it was made explicit, semantic interpretation was sufficient to decipher intended meaning. Context directly relevant for intention reading significantly facilitated comprehension of intended meaning.

4. Conclusions: Effect of various types of context on pragmatic interpretation

Our results indicate that (1.) within trials (metaphor, humor) the facilitating effect of "regular" context remains at the level of tendentious correlation (Fig. 5, 7); (2.). in humor tasks the effect of context is more pronounced between modalities (verbal- vs. non-verbal) (Figure 7), (3) context targeting the mental state of the speaker significantly aids deciphering of intended meaning.

Our findings confirm results in developmental research that surface cues help the recognition of communicative intent (Csibra 2010) and contribute to the successful resolution of the intended meaning at hand. Contextual effects thus may vary according to what they target: in the irony trial contextual cues targeted the mental state of the speaker, and thus were directly relevant for the deciphering of intended (i.e. pragmatic) meaning, and were therefore, optimally relevant from the point of view of non-compositional interpretation (Sperber-Wilson 1986). Due to this targeted optimality, such contextual cues enabled the subjects to interpret the utterance with a semantic, literal interpretation, hence no mentalization skills were required. We claim that contextual cues relevant for the decoding of the intention of the speaker and thus of intended meaning facilitate the interpretation of implicit, pragmatic meaning to a

greater extent than „regular" contextual effect that remained at the level of tendentious interaction (see metaphor and humor tasks). The effect of context in between modalities (visual vs verbal) was more significant compared to contextual effects within the verbal modality (decontextualized vs contextualized verbal stimuli): in between modalities contextual effects were more salient, and were also relative to cognitive schemes, confirming the Cognitive Congruency Principle (Zigler-Levine-Gould 1966).

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