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The Implicature and Perspective-Taking Task: A novel way of investigating the relation between pragmatics and mind-reading *

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1 Introduction

Communication involves making inferences about what others mean, beyond what they say explicitly. One type of communicative inference is known as an 'implicature': for instance, if in answer to the question, *What is on your card?*, the speaker replies, *There are apples*, then the hearer may infer that there are *only* apples on the speaker's card. This is a pragmatic inference that is guided by maxims of how people use language. In this specific case the inference is further known as an ad hoc quantity implicature because it relies on the maxim of quantity of information, which enjoins speakers to give as much information as they can (*modulo* other pragmatics maxims, see Grice 1975, Hirschberg 1991).

Widely-accepted, though diverse, approaches to pragmatic inference have in common the notion that such inferences not only involve an assumption that the speaker is observing pragmatic maxims, but also take into account the speaker's perspective and epistemic state, including what is in common ground with the listener (which is also known as mind-reading, e.g. Frank & Goodman 2012, Grice 1975, Horn 1984, Sperber & Wilson 1995). In the example above, the hearer assumes that the speaker knows all the objects on the card (the Competence Assumption, Geurts 2010) and infers that, had there been other objects on the card, the speaker would have said so (the Epistemic Step, Sauerland 2004). If the hearer knows that the speaker is not fully knowledgeable about everything that is on the card for some reason, then he does not derive this implicature, but would arrive at the intended meaning that there are *at least* apples on the card, as far as the speaker knows.

2 Four Views on Pragmatics and Mind-Reading

While there is lively debate about the correct formulation of pragmatic maxims and their position in the architecture of the linguistic and cognitive system, it is widely

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acknowledged in the neo-Gricean tradition of pragmatics that mind-reading is necessary for pragmatics inferencing, not just for implicature, but for a wide range of phenomena, such as metaphors, ironies, the fixing of reference and the precise meaning of words, the determination of the illocutionary force of an utterance and many others. For example, a statement that *It is cold in here* may or may not be understood as a request for the addressee to do something about the room's temperature, depending the speaker's beliefs and intentions (e.g. considering if the speaker wishes to relax in this location or to store perishable items).

Proposals about pragmatics and mind-reading are linguistic-theoretical models, but they have implications for behavior and actual speaker competence. For example, from a developmental perspective, if the traditional view that pragmatic inferencing and mind-reading systematically co-occur, then they either have to develop simultaneously in acquisition or mind-reading has to be in place first in order to enable pragmatic inferencing. Similarly, theories of language processing need to integrate, at some level of online comprehension and production, the two skills. Moreover, from a neurodiversity point of view, a correlate of the close relation between pragmatics and mind-reading would be that people who may be challenged with mind-reading (for example, some autistic people) will also face challenges with pragmatics across the board.

According to alternative proposals about pragmatics and mind-reading, reasoning about the speaker's epistemic state is not always required in pragmatic inferences (e.g. Andrés-Roqueta & Katsos 2017, 2020, Breheny 2006, Jary 2013, Kissine 2016, Levinson 2000, Moore 2018, O'Neill 2012, Recanati 2003, Sperber 1994). However, within this broad range of views, there is little consensus on when mind-reading is required for pragmatics and when not.

Several theoretical pragmaticians have long argued about how to draw a distinction between pragmatic phenomena that require an understanding of the context and speakers' beliefs and intentions, and therefore engage mind-reading, and pragmatic phenomena that do not directly do so. Levinson has influentially proposed that default pragmatic principles are employed for the most routine and context-independent generalised implicatures such as scalar implicatures (Levinson 2000; with context and mind-reading having a secondary role only, in potentially cancelling generalised implicatures that were generated by default). These default implicatures are to be distinguished from ad hoc particularised implicatures which are derived in the standard Gricean account which involves considerations of what is relevant in the conversational context as well as the speaker's epistemic state and cooperativity. Recanati (2003) makes a distinction between primary and secondary pragmatic processes along the dimension of genuine consideration of the speaker's intentions being required for the latter only. O'Neill (2012) distinguishes between three types of pragmatics, one of which, mindful pragmatics, includes the kind of pragmatic phenomena that require allocentric reasoning such as humour, irony and sarcasm.

The way forward for these approaches, which relate certain classes of pragmatic phenomenon to the need for mind-reading, is for further empirical and theoretical research to attempt to classify this or that pragmatic phenomenon as requiring

mind-reading or not (or as default pragmatic, or as primary or secondary, or as mindful-pragmatic or not). Let us call this view where it is the pragmatic phenomenon that dictates whether mind-reading is needed, the *typological view* of pragmatics and mind-reading.

However, another two approaches aim to define the relation between pragmatics and mind-reading along categorically different dimensions. Kissine (2016) suggests that pragmatic processes (like implicature derivation) are distinct from pragmatic strategies, which may be more or less egocentric, taking into account the speaker's epistemic state to a lesser or greater degree. Depending on the context, hearers may arrive at an interpretation purely egocentrically (based on what is relevant for them in the context), allocentrically (which depends only on first-order Theory of Mind and allows interpretations which are at odds with the speaker's perspective to be ruled out), or using sophisticated 'Gricean' reasoning about the speaker's epistemic state (using second-order Theory of Mind such that the hearer's interpretation of the utterance is embedded in reasoning about the speaker's intentions). Crucially, some sort of pragmatic inferences may be possible under all these strategies in different circumstances, with adults switching between strategies as required (Kissine 2016, Deliens, Antoniou, Clin & Kissine 2017). This also means that children could develop pragmatic strategies consecutively, so that some inferences are available to them in some contexts under an egocentric strategy before they engage fully with epistemic reasoning in pragmatic inferencing. Let us call this approach the *strategies view.*

Another alternative proposal also argues that mind-reading is selectively engaged in pragmatic inferencing. However, it is not the pragmatic-theoretical type of the phenomenon that makes the difference on whether mind-reading is necessary (as per the typology view), nor is it the range of interpretative strategies that listeners have at their disposal (as per the strategies view), but rather it is the communicative situation that an utterance is uttered in that signals whether mind-reading is required or not (see Andrés-Roqueta & Katsos 2017, 2020).

What might the conditions be that regulate engaging mindreading? Here one can draw on work by Garrod and Pickering on *alignment in conversation* (Garrod & Pickering 2004, Pickering & Garrod 2006). This work suggests that in their effort to make communication successful and efficient, interlocutors may align their mental models of the situation to the effect that their communicative behaviour, from phonetic features to lexical choices and – crucially in our case - their assumptions about each other's mental states, converge. Cues that interlocutors might be using to reach the assumption that their mental states are aligned come from various sources, as discussed in Garrod and Pickering's work and as proposed by work on *grounding*. As regards the latter, Clark & Brennan (1991) highlight the importance of physical co-presence of the speaker and the listener, that they can see each other and their mutual surroundings, that they are using a spoken medium rather than a written one, and the fact that they are communicating in real time, and that their attention is focused exclusively on the conversation ongoing between them. A history of successful communication between the interlocutors, including in the preceding turns (for example establishing and maintaining reference as the con-

versation unfolds and using words from their common vocabulary) is another cue to interlocutors that they may assume that they are engaged in an activity where their mental states are aligned.

In such situations, interlocutors may derive pragmatic inferences by representing the perspective of the speaker as required in intersubjective theories of pragmatics such as Grice's, but in the most frugal way. Listeners' assume that their partners' mental world, their knowledge, preferences, and intentions as regards the communicative situation are identical to their own (i.e. the listeners'). This is not a pure ego-centric processing strategy, because a mental state for each interlocutor is represented; but it is not an active intersubjective mind-reading strategy either, in that no divergences between the partners' mental states are considered. In mentally aligned situations, words and sentences uttered by the speaker have been designed with a listener in mind whose mental world is identical to the speaker's. Mutatis mutandis for the listener, who interprets the speaker's words and sentences in the way that the speaker would mean them, if the speaker's mental states were the same as the listener's. As a result, a listener in such mentally aligned situations will arrive at interpretations that are pragmatically appropriate FOR THEM. In different theories' technical terms, listeners will arrive at cooperative (Grice 1975), or salient (Giora 1997) or relevant (Sperber & Wilson 1995) interpretations as if the speaker were themselves. However, in situations that do not clearly signal alignment of mental states, our proposal is that interlocutors often do engage in active mind-reading and use this in order to compute what is in the common ground, what the speaker's intentions are, etc.

The proposal here is that it is the situation (and specific cues within it) that dictates whether interlocutors assume they are aligned or not, and as an outcome whether they engage in active mind-reading. From this view we can derive predictions about challenges with pragmatics as a function of mind-reading, especially in nonaligned situations as regards the monitoring of the situation on the one hand, and the implementation of mind-reading on the other. Specifically, a listener might not arrive at a speaker's intended meaning either because they have not appropriately monitored what kind of situation they are in and therefore they are erroneously not attempting to engage in mind-reading.

To summarize, I have outlined four views on the relation between pragmatic inferencing and mind-reading. The traditional view based on Grice's theoretical formulation of pragmatics is compatible with a cognitive model where mind-reading is a prerequisite of pragmatic inferencing. Another three views argue that mind-reading is only selectively required for pragmatic inferencing. Yet the exact nature of the relation between the two is a matter of controversy. Suggestions include the type of pragmatic inferencing at stake, the interpretative strategies that listeners have at their disposal and the communicative situation. In the next section I review some indicative evidence from psycholinguistics and language acquisition which help lend support to some of these views.

3 Evidence for the Selective Engagement of Pragmatics and Mind-Reading

Findings from online sentence processing paradigms with neurotypical adult participants suggest that that hearers do take into account the speaker's perspective in deriving implicatures. For instance, Breheny, Ferguson & Katsos (2013) used eye-tracking to test whether hearers anticipated or did not anticipate an ad hoc quantity implicature in their on-line sentence processing, depending on whether the speaker had or had not seen some relevant information. They found evidence that hearers looked more to the picture matching the ad hoc implicature interpretation at the point where it could be anticipated when the speaker was knowledgeable (shared their perspective) than when the speaker was ignorant (had a different perspective). Others' findings for scalar quantity implicatures (the inference from *some* to *not all*) from reading time (Bergen & Grodner 2012) or off-line measures (Goodman & Stuhlmüller 2013) support this conclusion.

However, results from the much more extensive literature on referential communication between adult interlocutors are more mixed. In the director task (Keysar, Barr, Balin & Brauner 2000), the speaker and hearer are typically sat on opposite sides of a grid displaying objects, with some objects visible only to the hearer and hidden from the speaker, who gives instructions to pick up or move objects. Evidence has emerged both for the early integration of expectations of informativeness with the speaker's perspective – where the hearer would ignore a relevant object that is visible to only him and look at or move an alternative object visible to both him and the speaker (e.g. Heller, Grodner & Tanenhaus 2008, among many others) – and for egocentric biases, where the hearer would instead be distracted by the relevant object which is visible to only him (e.g. Epley, Morewedge & Keysar 2004, among many others).

Another rich source of evidence on the relation between pragmatics and mind-reading is developmental psychology, and especially studies with autistic people who sometimes face challenges with mind-reading. Happé's (1993) highly cited paper on pragmatics in autistic children is credited as demonstrating that autistic people are challenged only with those aspects of pragmatics that require or mind-reading. Specifically, Happé's (1993) reported that autistic and neurotypical children who were not passing 2nd order theory of mind tasks were only challenged with ironies, while children who were not passing 1st order theory of mind tasks were challenges with both ironies and metaphors. However, children were in all cases successful with similes that do not require pragmatic reasoning.

However, Happé's (1993) and much of the ensuing work has been rightly criticised for not properly investigating the role of general language abilities (vocabulary and grammar, also known as 'structural language') of autistic people in relation to their pragmatic competence. Since then, much work suggests that pragmatic phenomena traditionally considered to be the flagship of the communicative impairment in autism (such as metaphor and irony) are not actually posing a challenge for autistic people, at least not beyond what one would expect given the structural language abilities of the participants. Work by Norbury and col-

leagues (Norbury 2005, Kalandadse, Norbury, Nærland & Næss 2016, Gernsbacher & Pripas-Kapit 2012) has been particularly influential in revealing that structural language abilities rather than mind-reading predict participants' performance with pragmatics.

Nevertheless, while it may be the case that structural language skills have an important role in pragmatics, there is actually robust evidence that autistic people are nevertheless performing lower than their neurotypical peers as regards pragmatics in those situations where there are increased mind-reading demands. Since this was not the case in all studies that tested pragmatics, it is not surprising that some specific studies and across the board meta-analyses would not capture this fact. But a careful look of some recently emerging evidence such as those reported in Deliens, Papastamou, Ruytenbeek, Geelhand & Kissine (2018) suggests that the very same autistic people who perform within the range of neurotypicals in conventionalised indirect speech acts –situations which do not require mind-reading- nevertheless performed lower than neurotypicals with irony –in situations where mind-reading is required.

The view that there are aspects of pragmatics that challenge autistic people, even after structural language skill has been factored in, has been advocated by Andrés-Roqueta & Katsos (2017), and more recent work by Norbury (2014) and others. Recent research which emphatically makes this point is reported by Andrés-Roqueta & Katsos (2020) who assessed the participants' pragmatic skills as well as their structural language, mind-reading and nonverbal IQ. In their study, participants were presented with a classic scalar implicature task where participants' response depended on their sensitivity to violations of informativeness. Andrés-Roqueta & Katsos (2017, 2020) called this a 'linguistic-pragmatics' task because in the specific situations in which an implicature was possible the demands on mind-reading were minimal. The most important factor was the listener's command of the meaning of quantifiers such as *some,* and the listener's sensitivity to the pragmatic maxim of informativeness. Participants were also presented with a pragmatic task requiring the understanding of complex communicative intentions modelled on Happé's (1994) Strange Stories task, including phenomena such as irony, pretense and lying; this was called a 'social-pragmatics' task because in the specific situations in which the critical utterances were used there were substantial demands both on structural language and mind-reading. The participants were 20 Spanish-speaking children aged between 4 and 10 years of age with a clinical diagnosis of autism and 20 children with a diagnosis of Developmental Language Disorder (also known as Specific Language Impairment) which were thoroughly matched for structural language skills (using tests assessing the production and understanding of words in isolation and of sentences). Two groups of neurotypical children were also included, 20 children age-matched to the autistic children and 20 younger children who were matched for structural language skills to the autistic children (this group was younger because the autistic children's language skills were below that of age-matched neurotypical children). While, by selection, the autistic children had the same structural language skills as the children with Developmental Language Disorder and the language-matched neurotypical children, they had lower struc-

tural language skills than the age-matched neurotypicals. Importantly, the autistic children had lower mind-reading skills (as assessed by two first-order False-Belief tasks) than all the other three groups. And equally importantly, all participants' nonverbal IQ was within the typical range for their chronological age.

On the view that autistic people perform as low or as high with pragmatics as their structural language skills (Kalandadse et al. 2016), it was predicted that autistic children would have low performance on both pragmatic tasks, linguistic-pragmatics and social-pragmatics, compared to the age-matched neurotypicals, and moreover they would perform to the same extent as the children with Developmental Language Disorder and the neurotypical language-matched group. On the other view, that autistic people perform lower than neurotypicals especially when mind-reading is required (Andrés-Roqueta & Katsos 2017) autistic people will perform lower than the neurotypical language-matched children and the children with Developmental Language Disorder in the complex communicative situations only.

In support of the latter view, Andrés-Roqueta & Katsos (2020) report that in the linguistic-pragmatic task, children with autism performed as well as the children with Developmental Language Disorder and Language-matched neurotypicals, even though the autistic group scored significantly below these two groups in the false belief task. In the social-pragmatic task, on the other hand, the children with autism performed significantly below the children with Developmental Language Disorder and the Language-matched group, even though they had the same structural language skills. Moreover, regression analyses revealed that structural language but not mind-reading was a significant predictor of success with linguistic-pragmatics in the autistic children and children with Developmental Language Disorder (reaching similar findings of previous research, e.g. Kalandadse et al. 2016; Norbury 2005). But highlighting the role of mind-reading in specific pragmatics tasks, regression analyses revealed that both structural language and mind-reading were each significant and independent predictors of success in the complex communication social-pragmatics task (in line with Andrés-Roqueta & Katsos 2017, more recent work by Norbury 2014).

The key difference between the early evidence offered by Happé's (1993), for a selective challenge with pragmatics, and the new evidence, is that there is a better understanding of the demands for mind-reading in the specific tasks used and a careful measurement and statistical consideration of the participants' structural language skills and false-belief abilities. This adherence to the top methodological standards identified by Kalandadse et al. (2016), is what allows Andrés-Roqueta & Katsos (2020) to highlight the unique contribution of mind-reading for some kind of pragmatics, in addition to the contribution that structural language makes.

Taking stock, we have already seen evidence that while mind-reading is engaged in the derivation of some routine and widely studied pragmatic inferences such as ad hoc quantity implicature (e.g. Breheny et al. 2013), a lot of successful pragmatic inferencing, including with scalar quantity implicatures (Andrés-Roqueta & Katsos 2020) takes place in the absence of mind-reading. Such findings would speak against a cognitive model inspired by Grice that necessitates the engagement of

mind-reading in pragmatics. How do these findings fit with the alternative three views, which advocate the selective engagement of mind-reading and pragmatics?

Starting with the typological view, there is already quite some evidence that it is not the most compatible with the existing evidence. Recall that Happé's (1993) study suggested that autistic people find metaphor less challenging than irony because the latter requires in-depth mind-reading (second-order Theory of Mind) – rendering irony an excellent candidate for the category of pragmatic phenomena that require mind-reading. But according to the systematic review by Kalandadse et al. (2016), metaphor and irony are more or less on par in terms of how challenging they are for autistic people, once the structural language abilities of participants are taken into account. In fact, sarcasm and irony are on balance somewhat easier for autistic people than metaphors. How would the typological view interpret this evidence? Should we interpret this as evidence that irony is one of those pragmatic phenomena that do not require mind-reading?

Moreover, a careful reading of another very widely cited study by Olofson, Casey, Oluyedun, van Herwegen, Becerra & Rundblad (2014), this time on metaphor, shows that autistic people with high structural language skills do not perform well on all metaphors. Specifically, they report a difference between the accuracy of comprehension of conventionalised and novel non-conventionalised metaphors, with autistic participants performing significantly lower in the latter compared to the former. Moreover, once one adapts chance performance to 50% rather than 33%, the autistic participants appear to score right at chance for novel metaphors (52% - rather than higher than chance as claimed by the authors).[1] What does this mean for metaphor as a pragmatic phenomenon overall?

To this challenging findings, one can add the emerging picture about quantity implicatures. According to a major proponent of the typological view, quantity implicatures are the pragmatic phenomenon par excellence which does not routinely require mind-reading. While this is compatible with the findings of Andrés-Roqueta & Katsos (2020), it does not square with the evidence by Breheny et al. (2013). A thorough investigation of this and other studies then systematically raises doubt about the promise of unambiguously classifying irony, metaphor, quantity implicature or any other pragmatic phenomenon as belonging to the type of pragmatics that does or does not necessitate mind-reading.

However, the evidence so far is compatible with the strategies- and situation-based views. Bearing in mind that neurotypical adults were shown to take the

[1] Olofson and colleagues set the chance to 33%. With 52% correct, the autistic group is reported to score significantly higher than chance. But–besides the two response options that are consistent with the literal or the metaphorical interpretation of the critical utterance- the three response options include a distractor option that is not a plausible match for either the literal or metaphorical or in fact any kind of relevant interpretation of the critical utterance be it metaphorical or literal. For example, for the metaphor that 'for human beings seeing-is-understanding' following a short narrative the options include a picture consistent with the metaphor (of a human in a eureka-moment), a picture consistent with a literal interpretation (of a human who can see a relevant object that has been mentioned in the narrative), and a picture of an irrelevant inanimate object not mentioned in the discourse. Once this is taken into account, chance level should be set at 50%, and it is hard to see how the autistic group's performance (with a mean of 52%, SD of 21% and a range of 21-90%) could differ from chance.

speaker's perspective in Breheny et al.'s (2013) online quantity implicature task, while autistic children and children with Developmental Language Disorder were successfully deriving quantity implicatures without recourse to mind-reading in Andrés-Roqueta & Katsos (2020), the strategies-based view would suggest that it is the interpretative strategies that participants have in their disposal which dictate when mind-reading is deployed; in this specific case, neurodiverse populations such as autistic children and children who face challenges with overall language development, do not have access to the full range of strategies that neurotypical adults do.

On the other hand, the situation-based view would suggest that the communicative situation in Breheny et al.'s study –with the clear indication that the speaker does not know everything the listener does- abounds with signals that the mental states of the speaker and the listener are not aligned; while the shared common ground, the full-view access and all other features of the study by Andrés-Roqueta & Katsos (2020) allow interlocutors to assume that their mental states are aligned. Is there any other evidence then that could help suggest which of the two views is more promising?

4 The Implicature and Perspective-Taking Task

In recent and ongoing work with colleagues, we put some of the predictions of the situation-based view of pragmatic processing to the test in a novel task. Specifically, we have adapted a version of the Director Task that has been widely employed in research in perspective-taking and common ground (e.g. Keysar et al. 2000), with the novel element that certain trials involve the application of the maxim of informativeness. In this version the listener can see what is depicted in all four cards in front of her, however the speaker who is asking her to pick a specific card can only see those cards that are not in the shaded square. The participant is in the listener's role and is familiarised with both the speaker's and listener's perspective to establish that she understands that the cards which are not in the shaded square are in the common ground while the card in the shaded square is in her privileged ground. In some trials the correct response to the speaker's instructions requires pragmatic inferencing, in some trials it requires taking the perspective of the interlocutor, and in some it requires both. We can illustrate this with reference to Figure 1 below, where the speaker's request is *Pick the card with pears* in all the conditions for ease of exposition.

For brevity, I focus here on Conditions B, C and D. In Condition B there are two cards which can be referred to as 'the card with pears' and therefore this instruction would be ambiguous, unless the listener employs informativeness in which case she should select the card that has just pears on it. This condition assesses whether participants are competent with informativeness in a mentally aligned situation because all the relevant information is in common ground. In condition C there are two cards which can be referred to as 'the card with pears' but one of them is in the listener's privileged ground. Hence the instructions are ambiguous unless the listener engages in mind-reading. This condition assesses whether participants can

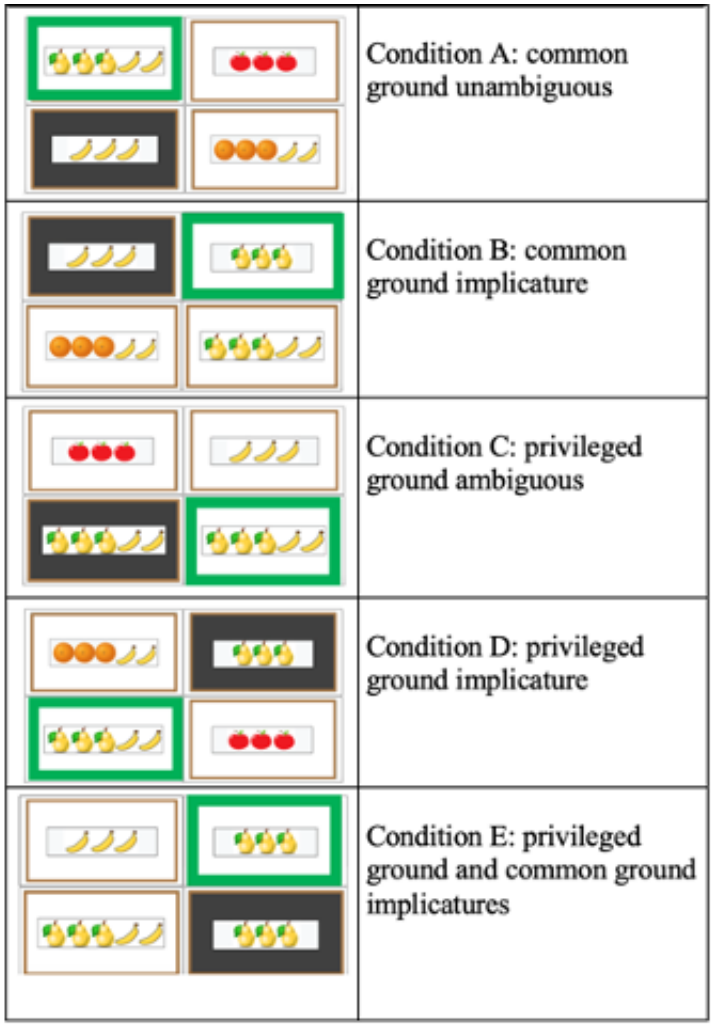

Figure 1 Sample displays from the Implicature and Perspective-Taking task. The shaded square represents the card that is visible to the listener but not the speaker; the green frame around a card indicates that this is the theoretically-optimal response. The labels on the Conditions indicate whether there is potentially interfering information in the privileged ground (privileged ground) or not (common ground), whether the instructions are ambiguous or not, and if an implicature needs to be derived by the listener.

monitor that this is a non-mentally-aligned situation. Turning to condition D, there are two cards that can be referred to as 'the card with pears' and the instructions are ambiguous. Informativeness as applied as if this were a mentally aligned situation would lead to the selection of the cards with just pears. However, if the listener monitors that this is a nonaligned situation and engages in mind-reading, then she should instead select the card with pears and bananas, because the card with just pears is not a card the speaker could plausibly ask for.

In recent work using this task (Wilson, Lawrence & Katsos to appear), we find that 6-year-old neurotypical children who pass False Belief tasks in other parts of the experimental session, could apply informativeness at ceiling rates in condition B, a mentally aligned-situation (all 33 children in Experiment 1 are classified as 'passers', scoring 5 or 6/6 correct responses). Many children also correctly monitored that they are in a nonaligned situation in condition C, though the majority did not do so (only 14/33 children were passers; or 42%). Moreover, children performed strikingly poorly in condition D, where informativeness has to be applied in a nonaligned situation (4/33 passers; or 12% - all of the passers were from within the 14 children that had passed condition C). Adults performed at ceiling levels in all conditions except condition D where only 27 out 36 were consistent passers (75%). In a separate ongoing study, adults have been tested in condition E as well, which is another nonaligned situation where mindreading helps by narrowing down the options available to the listener from her own perspective. Adult performance in condition E was 90% correct, which is high but lower than ceiling; and they only achieved 70% correct in in condition D, which is line with the 75% achieved by adults in Wilson et al. (to appear).

The findings from this new experimental paradigm demonstrate (i) that 6-year old children are still in the process of developing the ability to monitor whether they are in a nonaligned situation (only 42% of children succeeded in condition C). Since all the children passed a false belief task in another part of the experimental session, this is not a challenge with mind-reading itself, but with monitoring whether they are in a situation which requires mind-reading or not (a non-mentally aligned-situation or not); (ii) 6-year-old children are perfectly competent with informativeness in aligned situations (condition B); (iii) it is the combination of informativeness and a nonaligned situation that leads to exceptional challenge (only 12% of children succeeded in condition D). Similarly, while adults performed at high levels overall, they did not perform at ceiling in the two conditions where informativeness had to be applied in a nonaligned situation (conditions D and E).

These emerging results speak in favour of the situation-based view of pragmatics and mind-reading. However, they pose a challenge to the strategies-based view. If the main decisive factor was the participants' access to interpretative strategies that involve mind-reading (i.e. the allocentric or fully Gricean strategies in Kissine's 2016 terms), then the fact that all participants were passing first-order Theory-of-Mind tasks ought to guarantee that they have at least an allocentric interpretative strategy in their linguistic arsenal; and yet this fact does not explain the exceptional challenge that children face with Condition D where mind-reading and pragmatics are both required.

5 Conclusions

In this short article I outlined four different ways of conceptualising the relation between pragmatic inferencing and mind-reading. The presentation has been necessarily somehow simplistic and I have glossed over much nuance in the theories discussed. The aim was to identify the primary dimensions along which this rela-

tion has been looked at: as a necessary engagement of mind-reading for pragmatic inferencing to take place, or a selective engagement, along the lines of the type of pragmatic phenomenon in hand, the interpretative strategies that the listeners have access to, and the situation that communication takes place in. I then presented a novel task that my colleagues and I have designed to shed light on this question. I concluded that there is emerging evidence from neurotypical children and adults that the relation between mind-reading and pragmatics is not one that can be determined according to the type of pragmatic phenomenon, or by access to one interpretative strategy and not the other, but according to the situation of use. Correspondingly, informativeness, irony, and metaphor are not the categories that help us predict when autistic or neurotypical people will find arriving at a pragmatically appropriate interpretation challenging. Neither is the cognitive/interpretative arsenal that the listener has in her disposal. We should instead be looking at classifying situations of language use as requiring mind-reading or not or, as I called them here as 'mentally-aligned' or not. While I referred to some of the aspects of a situation that interlocutors might be using as cues to monitor what type of situation they are in, much research remains to be done. Moreover, further research may reveal that while the communicative situation is indeed an important parameter, other factors may also play a role. Especially as regards development and neurodiversity, there may well be a role for the lack of certain strategies in very young language learners or in learner with a diverse neurocognitive profile. At the very least, in this newly emerging point of view, the focus of research can encompass not only utterances and the pragmatic phenomena instantiated in them, but situations of use too.

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