Preprint (Accepted)


Title: Does a good argument make a good answer? Argumentative reconstruction of children's justifications in a second order false belief task

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Note: The first two authors are the main contributors to the writing of this paper, which is part of a larger research project initiated by Antonella Marchetti, Sara Greco and Anne-Nelly Perret-Clermont. The data were collected by Elisabetta Lombardi and Federico Manzi.

Keywords

second order false belief task, Theory of Mind, argumentation, argumentative activity type, issue, inference.

Acknowledgements
Anne-Nelly Perret-Clermont, Sara Greco, Antonio Iannaccone and Rebecca Schär wish to thank the Swiss National Science Foundation for the research grant, ‘Analysing children’s implicit argumentation: reconstruction of procedural and material premises’ (contract n. 100019-156690/1, 2015-2018), on which they are collaborating. This paper has been elaborated within the horizon of this research project; although the data analysed are different, the collaboration with A. Marchetti and colleagues has made it possible to bring forward our research on children’s argumentation funded within this project.

We are indebted to the schools that opened their doors to us for data collection. We are grateful to an anonymous reviewer for his/her precious comments on an earlier version of this manuscript. Finally, we are indebted to Athena Sargent for language editing.

Does a good argument make a good answer? Argumentative reconstruction of children’s justifications in a second-order false belief task

Abstract

This paper proposes a novel approach to interpret the results of a classical second-order false belief task (the ice cream man task) administered to children in order to investigate their Theory of Mind. We adopted a dialogical perspective to study the adult-child discussion in this research setting. In particular, we see the adult-child conversation as an argumentative discussion in which children are asked to justify their answers to the questions asked by the researcher. We analysed the specificities of the research setting as an argumentative activity type; we reconstructed and analysed the children’s answers on the basis of two models taken from Argumentation theory (the pragma-dialectical model and the Argumentum Model of Topics). Our findings show that some of the children’s partially ‘incorrect’ answers depend on the pragmatics of the conversation, the relation between explicit and implicit content, and a misunderstanding of the discussion issue. Other ‘incorrect’ answers are actually based on correct inferences but they do not meet the researchers’ expectations, because the children do not share the same material premises as the researchers. These findings invite further research on children’s reasoning and on the characteristics of argumentation within a research task.

1 Introduction

Within the theoretical framework of Theory of Mind, the present contribution deals with an unedited theme. Theory of Mind (ToM) is defined as the ability to attribute mental states (e.g., thoughts, beliefs, desires, intentions) to others (Wimmer and Perner, 1983). Understanding mental states allows explaining observable events by inferring unobservable entities (beliefs, desires, etc.). It also involves an understanding of the fact that others’ mental states may differ from one’s own, and may differ from reality.

In this study, we intend to show that interpreting a Theory of Mind research setting from an argumentative viewpoint might shed new light on children’s answers to a false belief task’s (a ToM task) questions and hence on the meaning of their performances. An argumentative perspective on the results of this task enables us to draw attention to what premises are shared between adults and children, what types of arguments children use when they justify their statements in response to the ‘test question’ and what possible misunderstandings might arise in the conversation. In particular, our study sets out to identify what type of arguments 10-year old children use when they attribute a false belief to a story character (i.e., they give an answer expected by the adult researcher), as well as when they give an answer that deviates from the adult’s expectations.
The false belief task, which we have selected for this study (see section 2.1), assesses the children’s ability to recognise that another person could believe something that the child knows to be false. The interpretation of a child’s attribution of mental states in such tasks is usually \textit{monological} by Theory of Mind approach, i.e., it is centred on the individual’s capacity to accommodate alternative perspectives. In this paper, we will consider the same task and the children’s answers from a \textit{dialogical} perspective, enabled in particular by Argumentation theory. According to this approach, the child is not seen as an isolated speaker who reacts to a task, but as an \textit{inter}-locutor, who reflects on the task, on the setting and on the meaning of what he or she is told by the adult.

In the \textit{monological} approach of classical Theory of Mind research, the adult researcher is considered a ‘neutral’ presenter of the task. On the contrary, in a \textit{dialogical} perspective, we make the hypothesis that, in the child’s eyes, the adult is not neutral; he or she is an interlocutor who is conducting a dialogue with the child. Hence, children try to make sense of what adults say: children also need to interpret what the adult requests from them, according to an agenda that is unknown to them and that they need to infer from the adult’s speech and behaviour. In sum, we propose a shift in the epistemological perspective adopted to analyse the results of the false belief task: we move away from a monological interpretation of the children’s answers and adopt a dialogical frame, considering that knowledge is always co-constructed by adult and child in interaction (Gilli and Marchetti, 1991; Perret-Clermont, Perret and Bell, 1991). In other words, we consider the rigid question-and-answer setting that is typical of the false belief task as the setting of an ongoing dialogue.

If one accepts this epistemological shift, a fundamental misalignment between adult and child is immediately made visible. In fact, while the child might believe that he or she is taking part in an open dialogue, researchers consider the same situation as very closed, because they expect children to answer their questions by selecting possible answers from a very restricted paradigm. Adult and child, thus, are not ‘playing the same game’. We might say that they are not taking part in the same conversation, which is extremely important if we consider that children’s understanding of the relevance and purpose of researchers’ questions influences the quality of their answers (Siegal, 1997).

Previous research has shown that this adult-child misalignment might be partly explained by considering Grice’s (1975) principle of cooperation. After having defined principles of cooperation in conversation (\textit{conversational maxims}), Grice observed that conversational rules are often broken by the speakers; in natural talk, this gives rise to \textit{conversational implicatures}. As Siegal (1991) suggests, children are sophisticated when they use conversational rules in everyday natural talk, but they appear more limited in contexts that require specific knowledge required by adults who have suspended the ‘normal’ conversational rules. In a research setting, it might not be obvious for a child to interpret a situation in which an adult researcher seems either to violate conversational maxims or to ask the children to violate them. For example, researchers may ask questions to children (in the case discussed in this paper, these are closed questions) in which the answer is brief, obvious or repeated (Siegal, 1991). It might not be obvious for a child to understand how to answer such questions. It is not easy, for example, to state the obvious if this is requested by an adult’s question, because stating the obvious violates the ‘maxim of quantity’, which is normally used in conversation, and which states that speakers should be as informative as possible and give as much information as is needed and no more. Moreover, children may misinterpret the researchers’ purpose or their use of language, responding incorrectly because the conversational worlds of adults and children clash, as Siegal (1991) suggests, and not because they do not know the answers. Children may perceive researchers’ questions as irrelevant and/or deceptive, while researchers may assume that children share the same meaning of certain words with them when it is not the case. Siegal’s observations raise important questions about the \textit{reasons} behind answers that are traditionally codified as ‘correct’ or ‘incorrect’ (‘right’ or ‘wrong’) in situations such as the false belief task.
In the present contribution, we take all these observations into account and we propose to respond to the following research questions: what inferences do the children do when they justify their (‘correct’ or (‘incorrect’) answers? Where do possible misunderstandings between adults and children lie? What is there, at the inferential level, behind the answers that are traditionally considered ‘mistakes’ in the perspective of Theory of Mind? And how does the dialogue between adult and child – within the constraints imposed by the specific setting of the false belief task – impact on these inferences? In order to answer these questions, we propose to analyse the findings of a false belief task moving from the perspective of Argumentation theory. More specifically, we consider the research situation as a context of social interaction in which both participants are engaged in a dialogue and, more specifically, in an argumentative discussion, because children are explicitly asked to justify their answers. In fact, as van Eemeren and Grootendorst (2004) put it, ‘argumentation is a verbal and social activity of reason aimed at increasing (or decreasing) the acceptability of a controversial standpoint for the listener or reader, by putting forward a constellation of propositions intended to justify (or refute) the standpoint before a “rational judge”’. Argumentation, thus, is central to the question-and-answer process that happens in the false belief task. Moreover, argumentation studies in the last decade have emphasised the influence of context on dialogue and argumentation. Building on this research, we will be able to specify how some of children’s inferences might be constrained by the specific setting in which the discussion takes place, thus taking into account Siegal’s observations discussed above. In sum, adopting the perspective of argumentation enables us to clarify what inferences the children do when they give ‘correct’ or ‘incorrect’ answers, whilst at the same time it enables us to situate the children’s inferences within the context of the social dialogic interaction that takes place in the research setting.

Notably, even though many studies have shown a significant relationship between language measures and children’s performance on false belief tasks in both typically developing children (e.g., Astington and Jenkins, 1999; Hughes and Dunn, 1998; Ruffman, Slade, Rowlandson, Rumsey and Garnham, 2003; San Juan and Astington, 2017) and in clinical samples (e.g., Happé, 1995; Tager-Flusberg and Joseph, 2005; Miller, 2009; Woolfe, Want and Siegal, 2002; Wellman and Peterson, 2013), to our knowledge, no prior studies make an attempt to describe the type of argumentation that children display when giving justifications in a false belief task. In this sense, this paper proposes a novel theoretical and methodological interpretation of the results of false belief tasks.

2 The false belief task as an argumentation context

2.1 Theory of Mind as a theoretical framework and rationale of the False Belief Task

Children’s Theory of Mind has been a lively area of research in developmental psychology for the past four decades. Theory of Mind refers to the child’s capacity to recognise that the mind exists and can have different states and processes and also that causality exists between mental processes and actions (Lee and Homer, 1999). Researchers have investigated young children’s understanding of themselves and other people as mental beings, as people who have beliefs, desires, emotions, and intentions, and whose actions and interactions can be interpreted and explained by taking these mental states into account (Premack and Woodruff, 1978). The mental state of belief has been a particular focus of interest, with successful performance on false belief tasks taken to mark the acquisition of a representational theory of mind (Wellman, 2002). The false belief task assesses children’s ability to reason about the behavioural consequences of holding a mistaken belief. Within a socio-constructivist approach to Theory of Mind (e.g., Antonietti, Sempio, and Marchetti, 2006; Antonietti, Confalonieri, and Marchetti, 2014), Astington and Olson (1995) claim that, through participation in social exchanges, children construct an understanding of mind within social interaction (for an overview
see Carpendale and Lewis, 2004). From this perspective, children’s past knowledge (explicit, implicit) will influence the development of their social understanding, and there is a relevant impact of the social environment on the development of Theory of Mind capacity. Furthermore, in this sense, language is also considered a complex multifaceted system that is used for social communication and for individual mental representation (Vygotskij, 1962, 1978; Astington and Baird, 2005). As part of an interdisciplinary line of research on young children’s reasoning and discourse, this study focuses in particular on young children’s reasoning in a second-order false belief task. The understanding of false belief is a classical measure of Theory of Mind. The false belief task explores the cognitive aspect of Theory of Mind, (e.g., the ability to understand others’ thoughts and intentions). Children’s answers and justifications are generally distinguished in terms of ‘correct’ and ‘incorrect’ answers. Traditionally, only those explanations that explicitly show that the child is engaging in recursive reasoning about mental states are considered ‘correct’ (Sullivan, Zaitchik and Tager-Flusberg, 1994).

Recently, Perner and colleagues (2015) have discussed the problem of when children become able to represent beliefs; their study is based on the theory of mental files (Recanati, 2012), as applied to Theory of Mind. Perner and colleagues (2015) explain that children show sensitivity to other’s beliefs when they are absorbed in a story. Furthermore, these authors show that the ability to link regular mental files (representing one’s own belief on an object) and vicarious files (representing someone else’s belief on the same object) emerges around the age of 4 years. This supports other findings, which report children’s success on explicit false belief tasks at around the same age (see the discussion in Huemer, Perner and Leahy, 2018). In fact, it has been said that Theory of Mind emerges around 4 years of age (Wellman, Cross and Watson, 2001) as a first form of recursive thinking of the type: ‘I think that you think’ (Wimmer and Perner, 1983). A second form of recursive thinking ‘I think that you think that he/she thinks’ emerges around 8 years of age (Perner and Wimmer, 1985). Perner and Wimmer reported some variations in the children’s success across six studies they conducted with children between 5 and 10 years old. The authors report little success before the age of 6 and less than perfect performance even by the age of 7 or 8. It has been hypothesised that helpful prompts during the administration of the scenarios led to some improvement in performance. While early studies considered Theory of Mind as an all-or-nothing competence (e.g., Baron-Cohen, Leslie and Firth, 1985), more recent works (see, for example Wellman and Liu, 2004; Apperly, 2012) show that there is a sequence in the development of different aspects of this skill. Theory of Mind, therefore, develops during childhood and continues to evolve during adolescence (Valle, Massaro, Castelli and Marchetti, 2015) and adulthood (Apperly, Samson and Humphreys, 2009; Sommerville, Bernstein and Meltzoff, 2013). In fact, children progressively begin to understand that people represent the world in their minds in order to determine what a person says or does. This comprehension of the other’s perspective happens even in cases where people have misunderstood the representations of the actual situation.

The second-order false belief task is economic in terms of the administration’s time, but it does not allow to consider the development of Theory of Mind. In this sense, this task does certainly not exhaust the comprehension of the Theory of Mind ability, even when the evaluation of children’s answers includes not only their answers but also their justifications. Participants are asked to answer a second-order false belief test question and a justification question (see section 3.2); on the basis of these answers, the researchers provide a dichotomous attribution of the score (i.e., 0 for correct

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2 A mental file represents an object and what we know about the object. Within a mental file, we accumulate knowledge tracking the object and its referent. In some cases, the same object is conceptualised in different files. In such cases, the files must be linked through a coreferential file: this is the case of an attribution of belief. In fact, this type of file occurs when a person needs to discriminate one’s own belief about an object (as recorded on a regular file) from what another person believes about the same object (as recorded on a vicarious file for the same object). As Perner et al. (2015) suggest, in order to understand that the other person’s belief is about the same object as one’s own, the vicarious file needs to be linked to the regular file.
answers and 1 for incorrect answers both in the test and in the justification questions). The interpretation and coding of the justifications are intended to reflect the child’s ability to attribute and explain mental reasoning on the mental states of the characters of the story or the mental reasoning about false belief. However, this coding does not permit to explain the development of the theory of mind and leaves little space to understand why the children give certain answers, especially when these deviate from the expectations of the researchers. These critical observations on the results and their evaluation invite further research on the types of argumentative inferences that children are making when they are involved in a false belief task.

To our knowledge, the false belief task used to measure Theory of Mind has never been investigated from an argumentative perspective with the aim of opening a new interpretation of children’s answers. Previous studies in psychology have investigated research situations that included a child/children, a researcher and a task (see for example Donaldson, 1982; for a review, see Light and Perret-Clermont, 1989; and also Grossen and Perret-Clermont, 1994; Säljö and Pramling, 2015; Miserez-Caperos, 2017) but these studies do not concern false belief tasks or the Theory of Mind approach. In the following section, therefore, we will discuss the specific setting beforehand in order to explain how its characteristics impact on the adult-child dialogical process of argumentation.

2.2 The false belief task as an argumentative activity type

The last decade has seen the flourishing of studies on contextualised argumentation. It has been noted that it is important to understand the context or ‘activity type’ in which an argumentative discussion is developed both in order to understand the constraints imposed on the discussion occurring in that context (van Eemeren, 2010; Rigotti and Rocci, 2006) and in order to reconstruct the implicit premises that are understood only in that specific context (Rigotti, 2006; Rigotti and Greco Morasso, 2010). Starting from this background, a first significant aspect of our present study is that it offers an initial analysis of argumentation in the research setting of the false belief task, which, to our knowledge, has not been investigated before from this perspective. Therefore, it is important to characterise the context of the interaction by specifying those aspects that might contribute to explain some of the problems with the evaluation of the children’s answers, which we have outlined in the previous sections.

According to van Eemeren (2010, p. 139), ‘Communicative activity types are conventionalized practices whose conventionalization serves, through the implementation of certain “genres” of communicative activity the institutional needs prevailing in a certain domain of communicative activity’. Communicative activity types may be ‘inherently or “essentially” argumentative’ (van Eemeren, 2010, p. 145), such as, for example, political debates, or ‘predominantly’ argumentative, or ‘coincidentally’ argumentative, or not argumentative at all. The concept of activity type, according to Rigotti and Rocci (2006), must be enriched with an understanding of the institutional and interpersonal dimensions of a context. The institutional dimension accounts for the actual situation in which an interaction takes place (called the interaction field). In particular, the interaction field ‘is that piece of social reality where the communicative interaction takes place’ (Rigotti and Rocci 2006, p. 172). It is characterised and defined by common goals, which are shared by all the interagents, and which define the interagents’ mutual commitments and their social roles (ibid.). The institutional dimension also includes interaction schemes, namely ‘culturally shared “recipes” for interaction congruent with more or less broad classes of joint goals’ (Rigotti and Rocci, 2006, p. 173). The interpersonal dimension, on the other hand, consists of an interpersonal relationship between the involved persons (Rigotti and Rocci, 2006).

When an adult interagent with a professionally defined role (say, for example, a politician or a lawyer) enters a context such as parliament, or court, we might assume that he or she will largely be aware of
the interaction field and interaction schemes. But is it so for the setting of the false belief task? As illustrated below, in this case, the situation is more complex.

Previous research in sociocultural developmental psychology has emphasised that context is almost never a given, i.e., it is not a predetermined situation that is fixed and does not change during the interaction; also, the interpretation of the context might change depending on who is acting within that context. As pointed out by Perret-Clermont (2006), the interlocutors come into the setting with different cognitive stages, worldviews, implicit beliefs and personal involvements (see also Clément, Koenig and Harris, 2004) and take into account these components as aspects necessary to understand the construction of shared knowledge. In this sense, context changes and builds up during the interaction: there is no single and unambiguous interpretation of the events, but a multiplicity of ‘frameworks’ affects the involvement and positioning of the participants (Grossen, 2001). For example, when faced with similar specific tasks or settings, children might frame them differently: A question asked by an adult, for example, might be interpreted as a ‘school question’ (and, therefore, a question that requires a ‘right answer’) or as a playful situation, depending on how the children interpret the adult – is she a teacher or an adult friend? (See for example Schubauer-Leoni and Grossen, 1993; Iannaccone and Perret-Clermont, 1993; see also Siegal, 1991 and the discussion in section 1 of this paper.)

The problem of interpreting the context does not exclusively affect contexts in which children are involved – to some extent, this is a problem in each and every context. However, we might argue that interpreting the context is particularly problematic for children faced with a task proposed by an adult researcher, such as the children we study in our research (see Siegal, 1991). In what follows, we will give a more detailed account of the context of this research situation in terms of an activity type that is predominantly argumentative. The main characteristics of this activity type from an argumentative viewpoint are the following: (a) a possibility of misalignment of interpretation of the situation between the researcher and the children; (b) a limitation of the ‘freedom rule of argumentation’ which results in a relative rigidity of the context: it is the adult researcher who decides over the issues, predetermines what are the right standpoints (correct answers) and expects certain arguments from the children and not others. Any other type of interaction is ideally excluded from this activity type. In what follows, we will detail these two characteristics.

The first aspect is that the activity type of this situation is not shared between the children and the researcher and this might constitute a source of misunderstanding. This aspect has already been touched upon, albeit in other terms, in the psychological literature (Siegal, 1991; Siegal and Peterson, 1994; see the discussion in section 1). In argumentative terms, we might say that children need to interpret in what activity type they are involved: what are the goals of the interaction field, what is the role of the researcher and, as a consequence, what is their role as children; and what interaction scheme are they expected to take part in. The children’s interpretation is inevitably influenced, at least to some extent, by the introduction they receive. In fact, in order for the children to participate

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2 So far, the concept of activity type and the interpretation given by Rigotti and Rocci (2006) have largely (though not exclusively) been applied to settings in which the context is more or less ‘predetermined’ and all participants know the rules of the game proficiently. Think, for example, of the analysis of the Prime Minister Question Time in British parliament (Mohammed, 2010) or of the analysis of highly regulated argumentation processes in merger and acquisition processes (Palmieri, 2014). It is often adults with pre-determined professional roles who have been studied (see criticism in Greco Morasso, 2010).

3 In their experience of data collection, some of the authors of this paper noted that this way of introducing the task sometimes causes misunderstandings; in particular, the fact that the researcher tells the children that they will play a game with them might be interpreted in different ways. The children sometimes understand that they can choose themselves a game that they would like to play with the researcher, whereas the researcher has a clear ‘game’, namely the false belief
in the false belief task, the researcher brings them one after the other into a separate room or another
quiet place in the school where the task is set to take place. When visiting a school for the first time,
the researchers introduce themselves: they tell the children that they come from a university; they say
that they come because they need the children’s help in order to understand how and what they think.
To do so, they will make some activities and play some games together. The children see themselves
confronted with a setting that is similar to their usual school context, but it is not quite the same.
Moreover, school per se is not an easy context to interpret. In fact, school is an interaction field in
which different interaction schemes are normally applied (sometimes children are taught things by
adults; sometimes they need to discuss and be active; at other times they are tested; there are moments
for free play and so on). Finally, the children do not know the adult researcher and must interpret
his/her role. There might be uncertainty with respect to what a university, i.e., the ‘school of the
grown ups’, is, and about the specific aims of the interaction. The children’s perception of the
situation may therefore range from ‘playing a game at school’ to ‘being tested’.

In sum, the institutional dimension of the context (in terms of Rigotti and Rocci, 2006) is not
intersubjectively shared in this situation. Adults (researchers) are there to understand whether children
have acquired the concept of second-order reasoning but the children are necessarily unaware of this
goal. Moreover, the interpersonal dimension of the context is purposefully limited, since the
researcher and the children do not share any personal history and the setting leaves no room to explore
to what extent they share a common ground. Therefore, the experimental situation is deliberately
intended to completely inhibit the interpersonal dimension of the communication context (Rigotti
and Rocci, 2006).

The second aspect that characterises this context is that there is an evident asymmetry that concerns
who decides over the possibilities for argumentation to develop. In fact, it is the adult researcher who
presents a story to the children and then asks a question about the story (see section 3.1 for the details
of the false belief task). By so doing, the adult pre-determines the issue (or subject) of the discussion;
in other words, the adults ask the children a question that must be the problem at the basis of their
argumentation. The child is expected to present a claim, or standpoint, on this issue; and there is only
one standpoint that is pre-determined as correct (i.e., the correct statement expected as an answer to
the ‘test question’ in the false belief task, see section 3.1). Furthermore, the child is asked to justify
his or her standpoint with arguments; and these arguments must be the right arguments, i.e., those
expected by the researchers (in response to the ‘justification question’, see section 3.1). In sum, even
though children are explicitly requested to reason and produce argumentation in front of a researcher,
there are rigid constraints about what kind of argumentation is expected. In this sense, in the research
situation we are considering, there is a clear limitation of the freedom rule of argumentation (see van
Eemeren and Grootendorst, 2004), according to which, in an ideal argumentative discussion, all
participants must be left free to advance standpoints and arguments (on any issue that they consider
relevant).

However, despite the ‘rigid’ constraints on the research setting, it is not possible to completely inhibit an interpersonal
relationship between the participants, and this might bear consequences on how the task is interpreted or, simply, how
much a child feels at ease while reasoning and explaining his/her answers.
3 Methodology

3.1 Participants and materials

Eighty-six ten-year-old children (48 males and 38 females) took part in the study. The mean age was 123 months (standard deviation = 3.9). At the time of the study, the children attended the last year of primary school in northern Italy, and they were not clinically referred for any cognitive or learning difficulties; also, they were neither referred to social services nor reported for learning and socio-relational difficulties. The original language of the interaction was Italian. All the children were Italian native speakers and so were the researchers. These data relate to a wider study on Theory of Mind abilities. In this study, the children needed to complete, among other research questions, a classic second-order false belief task (the ice cream task, Perner and Wimmer, 1985), which measures the recursive thinking of the second level (i.e., ‘I think that you think that she/he thinks’, see section 2.1). Figure 1 presents the images that were administered to the children; in the following, we report the story that the researcher tells them.

Fig. 1 - Images provide to the children – illustration by Valeria Fogato

1. John and Mary are playing in the park. They see an ice cream man arrive. Mary would like to buy an ice cream but she has no money. So she is very sad. ‘Don’t be sad’, says the ice cream man to Mary ‘you can fetch your money at home, I’ll be there in the park all day’. So Mary goes home to get money to buy an ice cream.

2. John sees the ice cream man leaving the park in his van. ‘Where are you going?’ asks John. The ice cream man says ‘I’m going to sell ice cream outside the school, so I can sell more ice cream there’. So the ice cream man drives over to the school to sell ice cream. John goes home for lunch. Mary is at home.

3. Mary leaves the house and sees the ice cream man going to school and she asks ‘Where are you going?’ ‘I’m going to the school. I’ll be able to sell more ice cream there’, answers the ice cream man. ‘It’s a
good thing I saw you. Now I have the money to buy ice cream. I’ll follow you to the school’, says Mary.

4. After lunch, John goes to Mary’s house to play with her. Mary’s mother answers the door. ‘Is Mary in?’ asks John. ‘She just left. She said she was going to buy an ice cream’, says Mary’s mother. So John goes to look for Mary.

Immediately after the story, the children are asked two questions. Taken together, their two responses are considered a complete ‘answer’ to a false belief task. The two questions are the following:

• ‘Where does John think Mary will go to buy her ice cream?’ (test question)
• ‘Why does John think so?’ (justification question).

Control questions about memory and reality are also asked to all the children, and their answers are used to filter the children’s performance. Only children who pass the control questions are selected as participants in the study.

3.2 Analysis

As a first step, answers are codified in accordance to the expectations for the false belief task. In particular, according to the traditional coding (Perner and Wimmer, 1985), we attribute 1 point for each correct statement and 0 points for each incorrect statement for both test and justification questions. The total score range is 0–2 for the second-order false belief task. In the traditional coding, the score for the test question is an indicator of false belief understanding, and the score for the false belief justification question is an indicator of the child’s mental explanation. Table 1 shows the distribution of the answers and Table 2 the distribution of justifications.

<table>
<thead>
<tr>
<th>Correct answer</th>
<th>Incorrect answer</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>43 (50%)</td>
<td>43 (50%)</td>
<td>86 (100%)</td>
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</tbody>
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Table 1 Distribution of participants giving correct and incorrect answers

<table>
<thead>
<tr>
<th>Correct justification</th>
<th>Incorrect justification</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>39 (45.3%)</td>
<td>47 (54.7%)</td>
<td>86 (100%)</td>
</tr>
</tbody>
</table>

Table 2 Distribution of justifications

As a second step, we proceeded with an argumentative analysis of the answers. In order to do so, children’s answers (including their justifications) were transcribed according to the system proposed by Jefferson (2004), see Table 9 in the appendix.

In order to get an overview of the crucial aspects of the children’s argumentation behind their answers,

5 The control questions administered are the following: ‘Does Mary know that the ice cream man is at the school?’ ‘Does John know that the ice cream man has talked to Mary?’ and ‘Where did Mary go to buy the ice cream?’
we used the analytic overview (van Eemeren and Grootendorst, 2004), which includes all the necessary information for evaluating an argumentative discourse. The analytic overview helps determine the points at issue, recognise the positions that the parties involved adopted and identify the (explicit and implicit) arguments used; it shows how discourse is organised and how each individual argument is connected with the standpoint that it is supposed to justify or refute (van Eemeren and Grootendorst, 2004, p.118).

In this paper, we use the analytic overview to reconstruct the expected argumentation corresponding to an ‘ideal answer’ (standpoint + argument/justification) in the false belief task. Afterwards, on the basis of this ideal answer, we identify how real answers in our data correspond or deviate from this ‘ideal answer’ on the basis of the following criteria:

- The adequacy of the child’s standpoint with respect to the expectations of the ‘test question’; in other words, we consider whether the child’s answer corresponds or not to the expected standpoint;
- The adequacy of the arguments proposed in response to the ‘justification question’, compared to the expectations. In the false belief task, it is expected that children justify their standpoint with specific (pre-determined) arguments that should prove that the children understood the recursive thinking of the second order. Here, it is important to consider that, if a child gives an argument other than that expected, the justification is considered as incorrect even if the standpoint is correct. Looking at Tables 1 and 2, it is evident that incorrect justifications are more frequent than incorrect answers.
- The explicitness of the arguments in the justification; in other words, we consider whether or not the child makes all the expected premises of the argumentation explicit.

The reason why we have attempted this classification is not to evaluate the children’s performances or argumentative skills. We want to understand how the real answers collected in our data deviate (or do not deviate) from the ‘ideal’ expectations of the researchers from an argumentative perspective. Adopting an argumentative viewpoint, in fact, enables us to understand what type of reasoning is present not only in right answers but also in incorrect answers. Our hypothesis is that even an incorrect answer might conceal a good argument. We also hypothesise that the specific characteristics of this activity type (see section 2.2) might in some cases explain some of the deviations, which might depend on misunderstandings of the situation.

As a step further in the analytic overview, we devoted attention to the inferential principles of support that are at the basis of the different arguments used by children in our data. In order to do so, when analysing how each argument supports the standpoint, we introduced a simplified version of the Argumentum Model of Topics (henceforth: AMT, see Rigotti and Greco Morasso, 2010; Rigotti and Greco, under review) for the reconstruction of argument schemes. In particular, we are interested in showing what type of argument scheme is expected from the children in the false belief task, and what argument schemes the children are actually using. In this way, it will be possible to understand the inferential principles at the basis of children’s reasoning, even when they give an ‘incorrect’ answer. The AMT has been developed as a theoretical tool to reconstruct the inferential configuration of arguments, i.e., to show on what basis an argument supports the standpoint that it is supposed to justify (Rigotti and Greco Morasso, 2010, p. 493). Hence, the scope of this model is a fine-grained, micro-level analysis of argumentative inference, to be understood within a broader context of
dialogical argumentation. Characteristic of the AMT is that this model does not only identify the principle (locus) on which an argument is based (for example, cause-effect, analogy, opposition, the speaker’s expert opinion, and so on). The AMT differentiates between two types of premises that are present (either explicitly or implicitly) in each argument. First, it reconstructs the inferential-procedural premise, which is called maxim, following the terminology introduced in the tradition of study of inference in argumentation. The maxim is an abstract inferential principle, often expressed in an ‘if…then’ form, for example: ‘if the cause is present, the effect will be present’. Maxims represent major premises within the inferential configuration of arguments. Secondly, the AMT reconstructs material-contextual premises, i.e., those premises that do not depend on an abstract inferential level but on the speakers’ common knowledge and values. In other words, a maxim such as the one enunciated above (‘if the cause is present, the effect will be present’) needs to be instantiated in concrete cases in order to be used in actual argumentation. In this example, one should supply a general premise such as ‘the cause of trees blooming is the arrival of spring’ and a factual premise such as ‘spring has arrived’ in order to conclude that ‘trees will be blooming’. The inferential principle (or maxim) per se is not enough to draw conclusions in the actual world.

The distinction between these two types of different but interrelated premises is important for the aim of this paper, and it is the main reason why we have chosen to rely on the AMT for our analysis. In fact, when we consider ‘correct’ and ‘incorrect’ answers to a second-order false belief task, it is important to distinguish the children’s inferential skills from how they interpret the ‘material-contextual dimension’, which includes both the world of the story and the context of the discussion with the adult researcher. If a child has misunderstood a factual aspect of the story, for example, he or she will draw a ‘wrong’ conclusion in a perspective of a classic assessment of Theory of Mind. However, in this case, the inferential-procedural component of the child’s reasoning would not be incorrect. This paper sets out to go beyond traditional assessment; to this purpose, the AMT offers a more nuanced perspective of why an answer can be different from what researchers expect.

4 Results of the analysis conducted from an argumentative perspective

4.1 Classification of the categories of answers (including standpoints and justifications)

As a first step of our analysis, we reconstruct the analytic overview of the argumentation in the case of an ‘ideal answer’, i.e., of an answer that perfectly meets the researcher’s expectations (see section 3.1) and that is completely explicit. This first reconstruction gives us a novel perspective on the false belief task, as it allows representing the standpoint and arguments expected from children who respond to the questions. The representation of the analytic overview is based on van Eemeren, Grootendorst and Snoek-Henkemans (2002).

1 John thinks that Mary thinks that the ice cream man is in the park.
1.1a John knows that the ice cream man told Mary that he would stay at the park.
1.1b John thinks that Mary has not met the ice cream man while he was moving to go to school.

* The Latin term locus (literally, ‘place’) was introduced by Cicero in his attempt to summarise Aristotle’s metaphor of tópos (‘place’ in Greek). According to Cicero, a locus is intended as the place whence arguments can be drawn, i.e., as the ultimate source of inferential principles that can be drawn reasoning on a certain relational concept, such as cause-effect (for Cicero’s Topica, see Wilkins, 1903; for more details on these concepts, see Rigotti and Greco, under review).
The ‘ideal answer’ argumentation is composed of a standpoint (indicated by 1) and two *coordinate* arguments that constitute the expected justification. In this case, following Palmieri (2014), we consider as coordinate two or more arguments that are to be taken together at the inferential level in order to support the standpoint. In other words, arguments 1.1a and 1.1b are not supporting the standpoint independently; rather they are two premises of one and the same argument scheme, which is based on a relation called the *locus from cause to effect*. The locus from cause to effect establishes an inferential relation between a cause and its effect, stating that ‘if a cause is present, the effect will be present’. In the false belief task, interviewees are asked not only to say where John thinks that Mary thinks the ice cream man will be. They are equally asked to say why it is so; in other words, they are asked to reflect on the *causes* why John might think that Mary thinks that the ice cream man is in the park. The ideal justification, thus, is based on a cause-effect relationship, as children are asked to identify the causes why John thinks that Mary thinks that the ice cream man is in the park. As we can see from 1.1a and 1.1b, the ‘correct’ (expected) argumentation is based on two causes: the former (1.1a) concerns something that John knows for sure, i.e., the fact that the ice cream man told Mary that he would stay in the park. The latter (1.1b) concerns what John thinks, i.e., that Mary has not met the ice cream man and that therefore she does not know that he has moved to the school.

It is important to say that, in the false belief task, the ‘ideal answer’ that is expected contains both the standpoint (1) and the two premises (1.1a and 1.1b) as *explicit* parts of the justification. This means that children need to verbally express 1, 1.1a and 1.1b (or linguistic variations thereof) in order to get an ‘ideal’ answer.

Before moving to the analysis of the arguments actually given by the children, it is worth highlighting two aspects that need to be considered in relation to argumentative inference in this reconstruction. Firstly, premises 1.1a and 1.1b have a different epistemic status. In fact, 1.1a is a statement concerning what John knows. In order to construct this premise, the interviewed child needs to assume John’s perspective. Premise 1.1b, on the contrary, states what John does not know. Notably, the fact that the ice cream man has told Mary that he will go to the school to sell his ice cream would be a counter-argument that contradicts 1.1a; but John does not have access to this counter-argument. In order to construct premise 1.1b, the interviewed child must distinguish what he or she knows, having listened to the whole story, from what John is in the position to know given his role within the story. To put it differently, the world of the interviewed child and John’s world must be distinguished in order to construct premise 1.1b correctly (which is a key feature of the second-order false belief task).

Secondly, note that interviewed children are required to make inferences at two different levels but our analysis is primarily focused on one of them. In fact, our reconstruction of the ideal answer concerns the response to the test and justification questions: children are asked to assume a standpoint on the issue ‘where does John think that Mary has gone to buy an ice cream?’ and to justify their standpoint by means of a typical argumentative inference of a causal type. Ideally, they are expected to say 1.1a and 1.1b. Inference, however, also intervenes at a different level in this process, namely when children construct their own beliefs on John’s beliefs. In other words, children first need to construct premises 1.1a and 1.1b by means of a process of inference, starting from the story they heard; through this process, they conclude that 1.1a and 1.1b must be the case. Such a process is different for 1.1a and 1.1b; as mentioned above, in fact, in order to conclude that 1.1b is the case, a child will need to distinguish what he or she knows from what John knows. In order to conclude that 1.1a will be the case, children will have to reason on the basis of the ‘promise’ that the ice cream man makes to John and Mary when he says that he will stay in the park the whole day. The authority of
the ice cream man as a reliable person is an important aspect to conclude that 1.1a is the case. However, the argumentative analysis that we are going to present in what follows is exclusively based on how the children answer the questions asked by the researchers, and not on the previous inferential reasoning that brings them to believe 1.1a and 1.1b. At the level of the expected answer to the researcher’s questions, the causal reasoning reconstructed above is predominant. Nonetheless, the other inferences that we have briefly illustrated might arguably play a role in the different answers that children give to the test and justification questions (see the discussion in section 5).

Starting with the analysis of the ‘ideal answer’ (standpoint and justification) illustrated above, we analyse the different arguments actually given by the interviewed children and classify them according to the different deviations from this ideal answer. As said above, our aim is not to evaluate the children’s arguments but to understand how and why they are different from the expected answers. We ask ourselves, what are the degrees of adequacy in a sort of continuum from closest to furthest with respect to the ideal justification? From the viewpoint of argumentation, this enables us to understand what kind of deviations there are and to what reasons they are due; in this way, we wish to understand what argumentative paths the children take when they reply to the test question.

Taking into account the criteria described in section 3.2, five main categories of answers emerge from the analysis: in the first three categories (A, B, C) the standpoint responding to the ‘test question’ is in line with the researcher’s expectations; in Categories D and E, the standpoint assumed by the children does not meet the expectations.

Category A: The expectations are met: the response to the ‘test question’ is correct and corresponds to standpoint 1. Children explicitly argue their justification including both 1.1a and 1.1b.

Category B: The expectations are met: the response to the ‘test question’ is correct and corresponds to standpoint 1. In the justification, children mention only 1.1a.

Category C: The expectations are met: the response to the ‘test question’ is correct and corresponds to standpoint 1. In the justification, children mention only 1.1b.

Category D: The response to the ‘test question’ does not adhere to the expectations (so it is different from standpoint 1 and, therefore, would be considered incorrect. For example, in this case, children may refer to John or Mary’s perspective; however, children justify their answer by means of arguments that are reasonable in their perspective.

Category E: The child’s answer (standpoint and justification) does not answer the researcher’s ‘test question’; in argumentative terms, the issue of the discussion proposed by the researcher is not understood or not taken up by the child. The child responds to something else and gives a different reconstruction of the story: e.g., a reconstruction referred to John and Mary’s hypothetical and possible experiences; or to John and Mary’s desires; or to the child's own personal experience.

Table 3 shows the frequencies of the categories of answers.

*We are grateful to our anonymous reviewer for having suggested important considerations concerning inference in this specific case, in particular the difference in epistemic status between 1.1a and 1.1b and the different levels of inference that are present in this case. Because this task has to do with second-order reasoning, there is more than one level of inference that comes into play.
<table>
<thead>
<tr>
<th>Categories of answers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>5 (5.8%)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>27 (31.4%)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>8 (9.3%)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>35 (40.7%)</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>11 (12.8%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>86 (100%)</td>
</tr>
</tbody>
</table>

Considering (see Table 3) the high number of ‘correct’, i.e., expected answers (46.5% of the sample), the most salient aspect of these data is low frequency of Category A answers explicitly including both 1.1a and 1.1b (5.8%). Arguments 1.1a and 1.1b are often used separately by the children to justify their false belief answers (Category B + Category C = 40.7%). In particular, 1.1a is more often explicitly stated (Category B: 31.4%) than 1.1b (Category C: 9.3%). This aspect will be discussed in section 5.

Incorrect answers, i.e., answers that are not expected (53.5% of the sample, Category D + Category E) show that justifications are correct from a logical point of view, albeit they are not in line with the expectations of the false belief task (see the discussion in section 5). These justifications of ‘incorrect’ standpoints may refer to John or Mary’s point of view, ignoring the perspective of the other one or they may refer to John and Mary’s hypothetical and possible experiences, desires or personal experience.

### 4.2 Examples of the different types of answers and justifications

In this section, we select some representative examples for each of the categories identified in section 4.1. The first column in Table 4 and in the following tables refers to the test question, i.e., ‘Where does John think Mary has gone to buy an ice cream?’; the second column refers to the justification question ‘Why does John think this?’

Both transcription and analysis of the answers have been conducted in the original language (Italian) to avoid losing significant elements during the translation process. The transcriptions below are displayed in Italian followed by (our) English translation in *Italic*.

**Category A:** The expectations are met: the response to the ‘test question’ is correct and corresponds to standpoint 1. Children explicitly argue their justification including both 1.1a and 1.1b.

**Table 4: Examples of Category A**

| Response to the ‘test question’ (standpoint) | Response to the ‘justification question’ |
**Table 5: Examples of Category B**

<table>
<thead>
<tr>
<th>Response to the ‘test question’ (standpoint)</th>
<th>Response to the ‘justification question’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perché il gelataio aveva detto che l’aspettava là al parco</td>
<td>(1.0) Perché: prima il gelataio &gt;gli aveva&lt; detto che sarebbe: (.) rimasta là</td>
</tr>
<tr>
<td><em>Because the ice cream man said that he waited for her at the park</em></td>
<td><em>Because first the ice cream man told her that he would have stayed there</em></td>
</tr>
<tr>
<td>Al parco</td>
<td>(0.9) Perché prima &gt;gli aveva detto&lt; che: (.) lo aspetta (.) lo lo aspetta là (.) però lu- (.) lui: (0.1) lu- lui gli aveva detto che (.) &gt;gli voleva&lt; vendere:: cioè no- non glielo ha detto proprio↓ (.) e gli ha detto che gli &gt;voleva&lt; andare a scuola così almeno (0.1) ave- ve- (0.2) gli ne vende di più</td>
</tr>
<tr>
<td><em>At the park</em></td>
<td><em>Because first he told her that he waits for him he waits for her there but he he has told her that he wanted to sell them that is no really he did not tell her that and he told her that he wanted to go to</em></td>
</tr>
</tbody>
</table>

8 In this case, the original text in Italian would be (literally) ‘the ice cream man told him’. However, taking into account the context of the conversation, we interpret that the child is actually referring to Mary. Therefore, we translate the pronoun as ‘her’.

---

**Beh che sia tornata al parco**

**Ah that she went back to the park**

Perché se lei gli ha detto che stava là per i soldi magari è ancora là (.) e che lei non sa che (. ) anche il gelataio se ne è andato <e quindi> (. 02)

NO sa che se ne è andato però ha detto che magari l’ha visto e quindi CIOÈ pensa che sia andato al parco↓ NO proprio pensa che sia andato al parco proprio perché lui se ne è andato, lei però non sa che Maria l’ha visto <quindi> pensa che sia andato al parco.

Because if she told him that he was there for the money maybe he would still be there and she does not know that also the ice cream man left and so no, she knows that he (the ice cream man) left, but he said that maybe she has seen him and therefore that means he thinks that she went to the park; no he really thinks that she went to the park precisely because he left, she however, does not know that Mary has seen him (the ice cream man) and therefore he thinks that she went to the park.
school like this at least he had he would sell more of them.

Category C: The expectations are met: the response to the ‘test question’ is correct and corresponds to standpoint 1. In the justification, children mention only 1.1b.

Category C is different from Category A for reasons of implicitness. Traditionally, in Theory of Mind terms, answers in Category C are generally considered as indirect proof that the child has understood both 1.1a and 1.1b.

Table 6: Examples of Category C

<table>
<thead>
<tr>
<th>Response to the ‘test question’ (standpoint)</th>
<th>Response to the ‘justification question’</th>
</tr>
</thead>
<tbody>
<tr>
<td>E e è andata a casa per prendere i soldi ed è andata eee a ss è ritorna secondo Giovanni, Maria è ritornata al parco e lo sta cercando</td>
<td>(0.3) Perché Giovanni non ha visto che Maria ha incontrato (.) (h) il gelataio e stava andando verso la scuola</td>
</tr>
<tr>
<td>At the park</td>
<td>Because John did not see that Mary met the ice cream man and he was going towards the school</td>
</tr>
<tr>
<td>Al parco</td>
<td>.(perchè forse non ha saputo la notizia che è andato vicino alla scuola così vende più gelati</td>
</tr>
</tbody>
</table>

Category D: The response to the ‘test question’ does not adhere to the expectations (so it is different from standpoint 1 and, therefore, would be considered incorrect. In the justification, sometimes children add factual data that is either not in the story or contradicts the story. Apart from the factual data, however, the children’s argumentation is correct (see section 5 for more discussion).

Table 7 Examples of Category D

<table>
<thead>
<tr>
<th>Response to the ‘test question’ (standpoint)</th>
<th>Response to the ‘justification question’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A scuola davanti alla</td>
<td>Perché prima aveva parlato con il gelataio che gli aveva detto che lui</td>
</tr>
</tbody>
</table>
At school in front of school

Because before he has talked to the ice cream man who had told him that he would go to school because it was the time when the children got out and he could sell more ice cream.

Ehm è andata dove sta andando il gelataio cioè a scuola

Perché al gelataio gli ha chiesto ma: dove stai andando↑ e lui gli ha risposto che (0.2) va di fronte alla scuola perché vende molto di più.

He thinks that she went to school to buy the ice cream

Because he heard it ehm no wait because his mother has told him.

Table 8: Examples of Category E
5 Discussion

The aim of this study was to explore the main arguments behind children’s responses in a classic second-order false belief task, in order to further understand children’s competences in the use of second level recursive thought. Our analysis of children’s answers, enabled by the perspective of Argumentation theory, makes explicit some components that are lost with the usual dichotomous coding (correct/incorrect).

Our findings concern three main points. First, the fact that the issue in the false belief task setting is rigidly pre-determined by an adult researcher might cause misalignments and misunderstandings. This might explain what happens with Category E. In fact, this category seems to be related to a misunderstanding at the level of the issue of the discussion. The researcher asks: ‘where does John think Mary has gone?’ implicitly suggesting that the answer should be given on the basis of the story; children are not expected to imagine and add any detail to the explicit narrative that they are told. Some children, however, do not answer the question in this way but by re-elaborating the story that they have heard: they think of some other reasons why John might think that Mary has gone to the park and interpret the issue in a broader, more imaginative way. In sum, children change the discussion issue. This might depend on the characteristics of the false belief task as an argumentative activity type (see the discussion in section 2.2). In fact, because adults have a clear issue in mind but children are not aware of the adults’ goals, children might interpret the situation differently, i.e., they might think that the adults’ goal is to measure their ability to come up with some smart and imaginative interpretations of the story.

Second, the answers in Categories D and E show that it is possible to have arguments that are acceptable from the point of view of inference, even when the child gives an ‘incorrect’ answer or misinterprets the issue. An analysis based on a simplified version of the Argumentum Model of Topics (Rigotti and Greco Morasso, 2010) shows that the logical-inferential component of the children’s arguments is constructed correctly. In particular, the locus and maxim are always applied in a fashion that is acceptable from a viewpoint of inferential correctness, even in those cases in which the children’s arguments do not correspond to the researcher’s expectations. In Category D, both locus and maxim are correct and corresponding to the ideal answer, while the factual data are not corresponding to the story. To cite an example of this category, which has been presented in section 4.2 (Table 7), a child says that Mary’s mother has told John that she has gone to the school (but this is not what is explicitly told in the story): the problem in the child’s inference exclusively depends on this factual datum that is added to the story. In Category E, the children change the locus and introduce a locus from final cause, also called means-end argumentation. The maxim in this case is: ‘if an action enables an agent to reach an important goal, this action should be accomplished’. Children give flesh to this maxim by saying, for example, that the children go to the park because they are
playing football, or they want to have fun (see Table 8 in section 4.2). Notably, this kind of reasoning would be considered correct in other circumstances (it is true that people do things because they have a goal, and it is true that a plausible goal for a child is playing and having fun at the park). However, in the specific situation of the false belief task, the answer is considered incorrect. As shown, this is due to a misunderstanding or misalignment at the level of the question that corresponds to the issue of the discussion. In all these cases (taken from Categories D and E), thus, the sources of the children’s mistakes are not to be found in inferential shortcomings; they are due to factual or contextual knowledge and imagination. All this shows that children’s arguments might be inferentially solid, even when the researcher’s expectations are not met.

Third, our findings invite the reader to carefully consider the conversational (dialogical) and pragmatic context in order to fully understand children’s answers. This is particularly relevant, in our view, for Categories B and C, which are distinguished from the ideal answer A only because either argument 1.1a or argument 1.1b is left implicit (see section 4). Notably, we cannot be sure that, because there is an implicit argument, the children do not know about it or do not understand it. It is possible, from a viewpoint of the pragmatics of conversation and, in particular, of the Gricean principle of cooperation (Grice, 1975), that a child mentions only either 1.1a or 1.1b because he or she thinks that it is superfluous or pedantic to mention both. This would confirm previous findings by Siegal (1991), which we have discussed in section 1, as well as the observations made by Siegal and Beattie (1991) and Siegal and Peterson (1994), who focus their attention on the linguistic and conversational aspects of the false belief task. As Grice (1975) suggests, the information given should not be more than is useful. In this sense, speakers should not mention what is already known to the interlocutors or what the interlocutors can reconstruct by themselves. In the case considered in this paper, it is possible that the children feel that mentioning both 1.1a and 1.1b is superfluous in front of an interlocutor (the adult researcher), who is arguably knowledgeable about the subject of the discussion (and, in the eyes of the children, will possibly know the answer to the question he/she is asking!). Thus, it might be that the children understand the whole reasoning but decide to leave part of it implicit for reasons due to the pragmatics of conversation. Previous research on children’s argumentation (Anderson et al., 1997) has shown that often, when we have missing premises or missing conclusions in children’s arguments, this can be explained because children think that their interlocutors will be able to fill in this missing information.

Our figures show that children make premise 1.1a explicit more frequently than 1.1b (Table 3). This seems to suggest that children deem it more important (or sufficient) to mention what the ice cream man has said to John and Mary (factual knowledge) without finding it necessary to mention that John does not know that he has told Mary that he will go to school. This difference in frequency of how much 1.1a and 1.1b are made explicit might be connected to the different epistemic status of these premises, which we have discussed in section 4.1. As mentioned, 1.1a is a premise that is constructed on the basis of factual knowledge and based on the ‘authoritative promise’ made by the ice cream man; 1.1b is a counter-argument to 1.1a but John does not know it. Perhaps, the status of ‘unknown counterargument’ makes the children think that it is not worth making it explicit. For sure, however, we need more research on this point to draw a well-founded conclusion about the striking difference in how much 1.1a and 1.1b are made explicit.

*We thank our anonymous reviewer for suggesting this interpretation. We believe it is a promising suggestion but we would need further research on this point to conclude that this is the right interpretation.

10 The fact that the adult ice cream man makes a sort of promise to Mary and then breaks this promise immediately after would be another interesting aspect to investigate in future research: how do children interpret this? Does it have an impact on some of the wrong answers?
6 Conclusions

The foregoing discussion has attempted to underscore the importance of identifying the arguments underpinning children’s answers in a false belief task, interpreted as an argumentative activity type. This requires looking beyond the traditional classification (correct/incorrect) elaborated on the basis of their individual standpoints being ‘monologically’ compared to the expectations of the false belief task. For this reason, we have reinterpreted the task and the expected answer in argumentative terms, thus showing what is expected in terms of (a) type of arguments and (b) level of explicitness. Then we compared this ideal expected answer (standpoint and argument) to the real answers given by the children in an empirical study. The results show that a dialogic consideration of research settings allows us to illuminate the reasons behind children’s ‘correct’ and ‘incorrect’ answers, which can be due either to the pragmatic context of the conversation or to a misunderstanding at the level of issues. Moreover, we have shown that, even in those cases in which a child’s answer and justification do not meet the expectations, they can nevertheless be correct at the inferential level. The cause of the ‘mistake’ should rather be checked for in the material/contextual premises at the basis of the argument. This type of study helps to identify possible misunderstandings in adult-children interactions, thus opening ways to resolve them.

In future research, it would be interesting to explore the role that school rules (via the implicit communication contract that they frame) play in children's answers (Schubauer-Leoni and Grossen, 1993): for example, children may feel compelled to respond quickly to the researcher even if they are not sure of their answer. In other words, the familiarity with school activities as (different) activity types may have some influence on how the children react to the research situation. Moreover, our preliminary results invite us to further investigate the dynamic aspects (i.e., the role of researcher, setting, formulation of the instructions, assessment of the implicit in the answers, intersubjective component, etc.) that are part of the ‘display’ of the cognitive competence (Perret-Clermont, 1993). We noted, for example, that children do not know the adults’ goal when they are confronted with this task. Would the answers change if the children were told about the goals in a clearer fashion? Would these explanations be understood? The explanations themselves will also rely on (un)shared assumptions. Although the problem of interpretation of the context cannot be eliminated, how to design the interaction and the adult-child dialogue could be addressed in future research. In the same vein, the reasons behind some of the children’s ‘incorrect’ answers (for examples, Categories D and E) could be discussed if one introduced a more extended time for discussing the children’s answers and making their reasoning more explicit, instead of just asking one ‘justification question’. This would require that the researcher be attentive not only to the ideal answer that he or she expects but also to the hidden assumptions from a child's perspective, to the (new) issues potentially raised by the children and to their possible interpretations of the situation. Extending the dialogue between researcher and child at the end of the task (with close attention paid to the social conditions of this ‘dialogue’) could be a promising path for future research.

Acknowledgements

(Omitted for anonymity – the acknowledgements have been added to the title page for now.)

Table 9: Transcription notation (Jefferson, 2004)
<table>
<thead>
<tr>
<th>Sign</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>micro pause</td>
</tr>
<tr>
<td>(0.2)</td>
<td>timing pause</td>
</tr>
<tr>
<td>&gt; &lt;</td>
<td>speaking faster</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>drawl</td>
</tr>
<tr>
<td>()</td>
<td>unclear to transcribe</td>
</tr>
<tr>
<td>↑</td>
<td>raising intonation</td>
</tr>
<tr>
<td>↓</td>
<td>dropping intonation</td>
</tr>
<tr>
<td>CAPITALS</td>
<td>speaking loudly or even shouting</td>
</tr>
<tr>
<td>Hum(h)our</td>
<td>laughing within the utterance</td>
</tr>
<tr>
<td>An:</td>
<td>d</td>
</tr>
</tbody>
</table>

References


