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TYPICAL AND ATYPICAL PRAGMATIC FUNCTIONING OF ASD CHILDREN AND THEIR PARTNERS: A STUDY OF OPPOSITIONAL EPISODES IN EVERYDAY INTERACTIONS

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Abstract

Pragmatic functioning of ASD children is rarely examined in socially-meaningful contexts. This study investigates the way oppositional episodes are handled in such contexts by 25 families, 10 with ASD and 15 with typically-developing children. Oppositions occur whenever someone protests, refuses or denies someone else's action, request or statement. The analysis focuses on justifications accounting for the opposition and on their immediate persuasive effect. Analyses of 1065 oppositional episodes show no differences in justifications among partners and children, except for ASD children with a verbal age 3-4 years, who justify less than their matched controls. The persuasive effect of justifications on children and on partners differs according to their group and verbal age. Implications of the study and future perspectives are discussed.

Keywords: autism; pragmatics; oppositions; natural interaction; theory of mind

Introduction

Autism Spectrum Disorder (ASD) is characterized by socio-pragmatic dysfunctions. These dysfunctions are known as difficulties in perceiving and/or using social cues and knowledge to adjust to the needs of the interlocutor, and in conforming to conversational rules in everyday exchanges. For example, children have difficulties using language to address appropriate requests and refusals, to modulate their language according to the degree of knowledge shared with the interlocutor, to comply with turn-taking, to answer questions adequately or to stay on topic. This kind of dysfunction is found in subjects with different types of syndromes (i.e. SLI, ADHD, Williams, e.g., Botting and Conti-Ramsden, 2003) but is particularly prominent in ASD subjects where it is related to Theory of Mind (ToM) impairments. In ASD children, pragmatic difficulties are not limited to language and are not necessarily due to the lack of behavioral means of expression. Indeed ASD children may have at their disposal behaviors such as gaze, facial expressions, gestures and speech, but have difficulties in using them to communicate with people in diversified social contexts and with particular communicative functions. For instance, children may use pointing adequately for instrumental purposes, but they rarely use it to get people's attention to share their own interest (Camaioni, Perucchini, Muratori, Parrini & Cesari, 2003; Stone & Caro-Martinez, 1990). The development of ASD children may be comparable to that of typically-developing children with respect to some communicative functions

(e.g., requesting), while for other functions (e.g., attaining joint attention), it may be considerably delayed and present different profiles (Paparella, Goods, Freeman & Kasari, 2011).

Such form-function incongruities highlight the specific difficulties ASD children have in perceiving and using, in everyday exchanges, social cues as signals of the psychological states of their interlocutors (Baron-Cohen, Tager-Flusberg & Cohen, 2000; Happé, 1993; Tager-Flusberg, 2000). Difficulties in using behaviors in socially meaningful ways may also affect the relationship with their partners of communication who may, in turn; encounter difficulties in interacting with ASD children, given that the appropriate cues necessary for the interpretation of these children's communicative intentions are scarce (Snow, 1995).

Studies of the pragmatic development of ASD children

Although socio-pragmatic dysfunctions of children with autism are acknowledged by many researchers, a thorough description and understanding of their manifestations and of their impact on everyday life is limited by prevailing research methods.

Indeed, one of the most common methods currently used consists of meta-cognitive tasks that solicit, in experimental settings, children's judgments on the adequacy of statements, or their interpretation of the non-literal meaning of utterances (Happé, 1993; Fine, Bartolucci, Szatmari & Ginsberg, 1994; Leekam & Prior, 1994; Ozonoff & Miller, 1996; Surian, Baron-Cohen & Van der Lely, 1996; Dennis, Lazenby & Lockyer, 2001; Norbury & Bishop, 2003; Pexman et al., 2011). Given

their high metacognitive demands, these tasks cannot be easily used with children of a developmental level below six years. Moreover, although these studies are useful in pointing out problematic areas in the cognitive underpinnings involved in pragmatic adjustment, their external validity is limited by the fact that the tasks' constraints differ in a number of ways from everyday contexts where these skills are used. Other studies aim to obtain information about the pragmatic functioning of children in a variety of social contexts. However, often, this type of research can provide only indirect information since it is based on caregivers' representation of children's behavior, obtained through answers to clinical inventories or checklists (Bishop 2003; Charman, Drew, Baird & Baird, 2003; Cohen, Schmidt-Lackner, Romanczyk & Sudhalter, 2003; Lam & Yeung, 2012).

Studies of ASD children's pragmatic functioning based on direct observation of behaviors occurring naturally are still scarce (Volden, Coolican, Garon, White & Bryson, 2009). These studies have analyzed free-play episodes and naturally-occurring conversations of children in interaction with a familiar adult, in school or in a clinical environment (Adams, Green, Gilchrist & Cox, 2002; Muskett, Perkins, Clegg & Body, 2010). Depending on the verbal competencies of the children, they have looked at general indicators of pragmatic functioning, such as rate of initiative and of response (Macintosh & Dissanayke, 2006; Jones & Schwartz, 2009), or have performed qualitative analyses of conversational sequences and considered features such as the adequacy of replies or the coherence in topic management (Wetherby & Prutting, 1984; Loveland, Landry, Hughes, Hall, & McEvoy, 1988; Stone &Caro-Martinez, 1990; Warreyn, Royers & de Groote, 2005; Chiang 2008; Pasco, Gordon,

Howkin & Charman, 2008; Prelock, & Hutchins, 2008; Ruble, 2011). These studies provide an important source of information, as they focus on fine-grained analysis of dyadic interaction and are based on behavior that occurs in everyday settings. Indeed, analyses of naturally-occurring behavior allow us to gain access to what children are actually capable of doing in different daily-life situations when they are engaged in meaningful interactions with familiar partners. With ASD children, such analyses enable us to identify more clearly areas of adequate and less adequate functioning, as well as the role of mutual influence between children and their partners in the unfolding of interactions.

The present study follows this line of research and extends it to observations of behaviors occurring naturally and spontaneously in the children's *home* while the children interact with familiar partners (mostly family members), interactions about which relatively little is known. This paper aims to assess more precisely the pragmatic functioning of ASD children and of their partners by studying their communicative engagements in such ecologically-valid and socially-meaningful contexts. As in previous studies of typically-developing children, we have targeted specific communicative acts in order to analyze naturally-occurring behaviors under comparable conditions while studying the effects of their natural variation and comparing them across families. Here, we will focus on the negotiation of oppositions and conflicts. These are communicative acts that occur frequently in natural interaction, starting from the second year of life. Because oppositional episodes need to be resolved in one way or another, they solicit the partners to draw on their most advanced communicative competences and are thus particularly demanding on socio-

pragmatic adaptation and psychological understanding (Eisenberg & Garvey, 1981; Eisenberg, 1992; Dunn, Slomkowsky, Donelan, & Herrera, 1995; Veneziano, 2001, Veneziano et al, 2004). Our goal is to apprehend children's capacity to use socio-cognitive resources during the dynamic flow of communicative interactions while also taking into account the functioning of their partners, and to capture not only atypical but also communicatively appropriate behaviors

Oppositional episodes

In oppositional episodes, children or their partners protest, refuse or deny the other's action, request or statement. These episodes, which involve contrasting intentions and/or points of view, are social situations that need to be managed (Eisenberg & Garvey, 1981) and whose solution requires taking the intentions and desires of the interactional partner into account, at least partially. One of the ways in which this can be done is to provide justifications that account for one's personal conduct. Indeed, the successful resolution of such oppositions requires the ability to justify one's oppositional behavior or speech act in order to persuade the interlocutor of the soundness of one's own position (Dunn, 1993; Veneziano & Sinclair, 1995; Veneziano, 2001). Earlier studies show that typically-developing children start offering justifications of their oppositions in the second half of the second year (Veneziano & Sinclair, 1995; Veneziano, 2001, 2010). This behavior may help persuade the interlocutor to change his/her initial intent and reduce the probability of his/her subsequent insistence (Eisenberg & Garvey, 1981; Dunn & Munn, 1987; Eisenberg, 1992; Slomkovsky & Dunn, 1992; Tesla & Dunn, 1992; Dunn, 1993; Haight, Garvey & Masiello, 1995; Veneziano, 2001, 2010). Within a socio-cognitive

and pragmatic approach to communication, it has been argued that the way children negotiate oppositional episodes and use justifications to persuade the interlocutor to accept their position, is among the uses of language that reveals children's *implicit Theory of Mind*—that is, the emergence of a practical understanding of the difference between one's own mind and that of another person, at the level of the "*know how*" that does not need conscious reflection on others' feelings and mental states (Dunn, 1991; Golinkoff, 1993; Veneziano & Sinclair, 1995; Veneziano, 2001, 2010). Indeed, the nature of the obstacles that children need to overcome in oppositional episodes is psychological, internal to the interlocutor: the way children try to influence their interlocutor's desires, intentions and beliefs provides a glimpse into their greater or lesser ability to take into account and influence those mental states, at least the mental states of their immediate interlocutors (Veneziano, 2001, 2010). From this point of view, the provision of a justification is functionally comparable to other uses of language that highlight aspects that are unavailable to immediate perception, such as references to past and future, to internal states, or to the meaning transformations of early symbolic play (Veneziano, 2002).

Oppositional episodes are also quite interesting to study in the interactions between ASD children and their familiar partners (Veneziano, et al., 2004; Veneziano & Plumet, 2009). Since these situations solicit the participants to draw into their resources in order to find a solution to the social contrast that has arisen, verbal means of expression should potentially have the underlying knowledge necessary to show it. In this paper we will focus in particular on the production of justifications by the children and by their partners, as well as on the effect that justifications offered *at the*

time of the first oppositional movement (FOM) have on the interlocutor, the partner or the child respectively. In this way, we will be able to evaluate children's ability to produce and comprehend justifications uttered to persuade the interlocutor independently of any subsequent solicitation or insistence. As they are intended to prevent a possible insistence on the partner's side, justifications of FOMs are anticipatory, while justifications occurring in subsequent movements may be a contingent reaction to the partner's insistence.

This type of pragmatic functioning will be analyzed at two levels of verbal abilities, ASD children of verbal age 3-4 and 6-7 years. Moreover, this competence will be compared to that of typically-developing children matched on verbal age and to younger 2-year-olds whose competences in this domain are just emerging. The reason to compare ASD children to this younger group is to examine the possibility that verbally less advanced autistic children might function pragmatically at an even lower level than their verbal age, as has been suggested in previous work (Condouris, Meyer & Tager-Flusberg, 2003, Veneziano et al., 2004; Volden et al, 2009).

The main questions and hypotheses of the study are:

1. Do families with typical children and with ASD children present a comparable number of oppositional episodes? The frequency of disagreements is probably similar in the two types of families, but differences may exist such as which interlocutor, the child or the partner, initiates these episodes, or in the mean length and the type of unfolding of the episodes.

2. Do children in the two types of families differ in the production of

justifications? We expect ASD children to be less likely than controls to offer justifications of their oppositions, especially in first oppositional movements, thereby reflecting their difficulties to take into account and, particularly to anticipate, the interlocutor's point of view. In contrast, we do not expect differences in the partners in this respect.

3. Do families differ in the effect that justifications have on the interlocutor? Studies of everyday interaction between young children and their familiar partners have shown that first oppositions that are justified have more chance to be accepted in the following turn than first oppositions that are not justified (e.g., Dunn, 1993; Veneziano, 2001, 2010). The effect of justifications could be less apparent in families with ASD children. Indeed, the interpretation of ASD children's intentions by their partners could be more difficult due to the fact that the children's justifications may be expressed less clearly. Justifications that partners address to ASD children could also have less impact on them due to these children's difficulties in language, social, and intentional understanding.

4. Do differences in children's verbal capacities relate to the types of results obtained? Previous studies have shown that success in ToM tasks requires much higher verbal levels in ASD than in control children (Happé, 1995). In our study, where we aim to capture implicit ToM abilities already available to 2-3 year-old typically-developing children, we might expect a similar décalage: only ASD children with a higher verbal age (6-7 years) could have developed sufficient socio-cognitive skills to understand the necessity to provide a justification of their oppositions and to be sensitive to those provided by their partners.

Method

The study was submitted to the ethics committee[1] and obtained approval. All families received and signed an informed consent form.

Participants

The data presented here concern 10 autistic children aged 5;11 to 9;2 years, and 15 typically-developing children aged 2 to 6;6. Ten control children were matched to the autistic children's mental/verbal age (one group at a verbal age of 3-4 years old and one group at 6-7 years old, see below for further details) and five were younger (2 years old). Given that autism is more common in boys, and in order to maintain homogeneity in gender-related socio-pragmatic expectations, all participating children were boys. They also had at least one sibling in order to obtain both a variety of interactions and homogeneity across families. Table 1 presents an overview of the sample. Details about their recruitment, inclusion criteria and developmental

[1] In France, research in the health domain needs to obtain the approval of an Ethical Committee for the protection of people (CCPPRB Comité Consultatif de Protection des Personnes pour la Recherche Biomédicale, Paris)

evaluations are presented below.

[Insert Table 1 about here]

Autistic children: Diagnostic tools and developmental measures

The participating ASD children were all diagnosed by experienced clinicians on the basis of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, APA, 1994), and the Autism Diagnostic Interview-Revised (ADI-R, Lord, Rutter & LeCouteur, 1994). They were recruited through the Psychopathology Unit for Children and Adolescents at the Robert Debré Hospital in Paris and through the SESSAD (Service d'Education Spécialisée et de Soins à Domicile), an organization specialized in the evaluation and guidance of autistic children. None of the autistic children was reported to have associated organic pathologies. As regards to the degree of severity of autism, evaluations with the Child Autism Ratings Scale (CARS, Schopler, Reichler, de Vellis & Daly, 1980) that had been conducted by the hospital or the guidance services were not available to the researchers of the present study. From clinical impressions, the majority of ASD children included in the present sample would fit the moderate range of autism. Families were of mid to high educational level.

All children had received cognitive and language standardized evaluations at the hospital or at the SESSAD. Examination of cognitive profiles showed that none of the children had verbal skill scores higher than their non-verbal scores. However, these measures could not be used as group descriptors, due to the heterogeneity of the instruments employed and to the time elapsed since the last examination. It was thus decided to administer, at the beginning of the study, the receptive sub-test of

the TVAP (*Test de Vocabulaire Actif et Passif*, Deltour & Hupkens, 1980), a French vocabulary assessment test similar to the BPVS - the British Picture Vocabulary Scale (Dunn, Dunn & NFER, 2009) -, which consists of 30 cardboard cards each containing six images as choices for target words. The receptive sub-test was chosen because it could be administered to all the children, even those with limited expressive language. Age-equivalences were derived from performance scores on the basis of standard normative tables established on French-speaking children. TVAP scores have been used in previous studies to estimate the verbal age of children with autism or with other language disorders (e.g., Rey, Tardif, Delahaie, Vol, Thomas & Masson, 2001; Bogliotti, Sernicales, Messaoud-Galusi & Sprenger-Charolles, 2008; Sprenger- Charolles, Bogliotti, Piquard-Kipfer & Leloup, 2009). On the basis of their TVAP score, ASD children were divided into two groups: A "low verbal age" group (AVA-) comprising of children with a TVAP score of 3 to 4 years, and a "high verbal age" group (AVA+) comprising of children with a score of 6 to 7 years.

Children of the Control Group

Children with typical development were recruited through kindergarten and primary schools. Families had a range of educational level comparable to that of the families of ASD children. Ten children were matched to ASD children on verbal age and were divided accordingly into 2 groups of 5 subjects each: TVA-, comprising of children with a verbal age of 3 to 4 years, and TVA+, for children with a verbal age of

6 to 7 years. Five children were 2 year-olds (TY group), who were included to provide a comparison between the pragmatic functioning of ASD and typically-developing children at a level lower than that corresponding to the ASD children's verbal age.

Data collection

After a familiarization session, all children were filmed in their home by one of the researchers (all female). A small-sized digital video camera was used to record video and sound. The camera was manually held most of the time; however, at times, particularly during dinner, it was placed on a tripod. The observer remained silent and kept a neutral attitude, but when directly solicited, responded briefly before returning quickly to her basic neutral expression.

Families were observed for at least three half days over a period of three to four weeks. All children were video-recorded while engaged in spontaneously occurring activities, such as a variety of play situations, dinner-table conversations, and book reading, and in interaction with their familiar partners (mother, father, sibling(s) and for one autistic child, also a close friend). The average amount of recording was 6 hours per family. For the present study one hour of interaction per family was analyzed. This included one uninterrupted dinner sequence (of 15-30 minutes) and uninterrupted sequences of spontaneous play to complement the dinner sequence until a total of 60 minutes was reached. Thus, the analysis was conducted on 25 hours of video recordings.

Data analysis

Data were analyzed following a method developed in earlier studies of young,

typically-developing, children. This method was intended to study naturally-occurring communicative events selected for their functional homogeneity (e.g., oppositional episodes), which were distinguished analytically according to theoretically relevant variables (e.g. the presence of a justification) (Veneziano, 2001, 2010).

Oppositional episodes

As in previous work (see Veneziano, 2001, Veneziano et al, 2004, for further details about the method of analysis), we first identified all naturally-occurring oppositional episodes in the video recordings. Oppositional episodes are defined by the presence of a First Oppositional Movement (FOM), that is, a turn in which the child or the partner explicitly manifests dislike, disagreement, aversion, or any other behavior contrary to the immediately previous action, proposal, demand, or statement of the other partner. The First Oppositional Movement could be produced by the child (and then the episode is considered to be child-initiated) or by the partner (and then the episode is considered to be partner-initiated). After the FOM, and independently of who produced it, all the movements were coded as Subsequent Oppositional Movements (SOM), acceptance movements, or movements that were neither, such as clarification requests and offers. All movements were analyzed until the resolution, considered to occur either when one of the partners accepted the other's position, explicitly or implicitly, or when a compromise was mutually accepted.

Justifications of Oppositional Movements

Oppositional movements may be justified or not. The justification of an oppositional movement provides the reason for the opposition. Example 1 presents a

justification occurring in the First Oppositional Movement (FOM), while example 2 presents a justification occurring in a Subsequent Oppositional Movement (SOM).

Example 1 –TY group: Child's Justified FOM

(A= Child's name) (The mother suggests that the child use the water contained in a small bottle) Mother1: *là t'as de l'eau A[2] #[3]là-dedans* 'here you have some water A # in there'	1st turn of the oppositional
Child2: *non pas assez* 'not enough' (looking back at his mother while holding a bathtub toy; then goes to the bathroom to take some water)	2nd turn: First Oppositional Movement by the child; Justified
Mother3: (lets the child carry out his action - to get water from the faucet)	3rd turn: acceptance by the mother -resolution of the

In the example above, the mother's suggestion constitutes the *first turn of the oppositional episode* given that it is refused by the child in the next turn. The child's refusal—the First Oppositional Movement—is justified by an evaluation of the quantity of water needed ('not enough (water)'). The third turn of the episode consists of the mother's acceptance of the child's action.

Example 2 - AVA- group: Child's justified SOM

(J= child's name)(Time to undress to go to bed) * Mother1: *Tes chaussettes, tes chaussettes, J !*	*1st turn of the oppositional episode

[2] A stands for the name of the child
[3] # stands for a silence comprised between half and 1 second

* Child2: *non* 'no'	*2nd turn: First Oppositional Movement by child: Non Justified
* Mother3: *Bah si !* 'Yes, you do !'	*3rd turn: Insistence by mother => opens conflictual episode
* Child4: *T'as pas envie de les enlever* 'You don't feel like taking them off' (pronoun reversal is this child's common	*4th turn: Child's Insistence in Subsequent Oppositional Movement; Justified
* Mother5: *Bah si si si, t'enlèves tes chaussettes J*	*5th turn: Mother's insistence
* Child6: Child takes socks off	*6th turn: Child's acceptance

In the example above, the child refuses the mother's directive without justifying his refusal. After the mother's insistence, he refuses again but this time implicitly, through a justification related to his intentional state. After the second insistence of the mother, the child complies.

The effect of justifications of FOMs: Different types of unfolding

The effect of the justification of FOMs on the interlocutor was evaluated according to the type of third turn found in the relevant episode.

1. Immediate or delayed acceptance - Following the FOM, the interlocutor accepts the previous opposition, explicitly or implicitly, either immediately on the third turn (see example 1 above) or after a "side sequence" consisting of a request for justification or clarification, which is immediately followed by acceptance. This is illustrated in example 3 below.

Example 3 – AVA- group: Acceptance after a clarification request

(R= Child's name) (Mother and child sit at the dinner table) Child1: *R il a fini*	1st turn of the oppositional episode
Mother2: *non, non, R n'a pas fini #2 mange* 'no no, R has not finished #2 eat'	2nd turn: First Oppositional Movement by the mother: Non
Child3: *pourquoi il a pas fini?* 'why hasn't he finished?'	3rd turn: request for clarification of FOM
Mother4: *parce qu'il reste plein à manger dans son assiette*	4th turn: answer to request for clarification
Child5: (R eats his dinner)	5th turn: acceptance by child - resolution of the episode

2. Immediate insistence - Following the FOM, the interlocutor insists on his/her initial intention or position, opening in this way an overt conflict (see example 2 above).

Figure 1 presents a schematic view of the possible types of unfolding of the oppositional episodes described.

[Insert Figure 1 about here]

Intercoder reliability

Several coders, all well trained in the coding system, performed the analyses. About 40% of the recordings were coded independently by two coders. The proportion of agreements obtained between the coders was 91.5% for the identification of oppositional episodes, with a Cohen Kappa coefficient of 0.65. Inter-rater agreement for the coding of justifications was 90.8%, with a Cohen Kappa

coefficient of 0.81, and it was 89.8% for the identification of all the components of the oppositional episode (including also insistence, acceptance and resolution), with a Cohen Kappa coefficient of 0.67.

Statistical analysis

Nonparametric statistics were used given the ordinal nature of the measures, and the fact that assumptions on the kind of distribution from which observations arise are unknown. For detection of overall group effects, data were analyzed using the Kruskal-Wallis test corrected for ties. When the overall result was significant, post-hoc comparisons were performed with the Mann-Whitney test. These two tests can be applied with samples as small as 5 in each subgroup. Wilcoxon signed-rank test was used for related samples comparisons (children *vs*. partners and for within group comparisons of insistence rate after justified *vs*. non justified oppositions). Statistical significance was set at $p < .05$. One-tailed tests were used when testing directional hypotheses and two-tailed tests in all other cases.

Results

Table 2 presents an overview of the oppositional episodes identified in the different groups.

[Insert Table 2 about here]

Results of the Kruskal-Wallis one-way analysis of variance show that there are

no significant differences among the three groups of families (autistic, matched controls, and younger subjects) in any of the measures presented in Table 2. Children and their partners engaged in a similar mean number of oppositional episodes per hour (about 40); the episodes have a comparable mean length of turns (4 to 5) and a similar overall rate of insistence (39%). The same results are obtained when verbal age is taken into account and the 5 groups are compared (AVA+, AVA, TVA+, TVA-, TY).

Oppositional episodes are more frequently initiated by partners than by children (Wilcoxon test[4], Z =3.87, p = .00011, 2-tailed). Pairwise comparisons performed in the different groups show that the same difference is significant in the group with ASD children (Mann-Whitney test U = 15, p = .009, 2-tailed) and in the group with verbally matched typically-developing children (U = 12, p = .003, 2-tailed), but it is only marginally significant in families with younger controls (U = 3, p = .055, 2-tailed) (with the Bonferroni adjustment of the alpha level at .017 since for 3 comparisons α =.05/3).

Justifications of oppositions

Partners' justifications

As can be seen in Table 3, the mean rate of partners' justifications in FOMs

[4] For Mann-Whitney and Wilcoxon signed-rank tests, we report Z values when the two samples contain 25 subjects, and respectively U or T values when the two samples contain either 5 or 10 subjects.

(range: 58% to 71%) and in SOMs (range: 34% to 44%) is very similar in the five different groups.

[Insert Table 3 about here]

Indeed, the Kruskal-Wallis one-way ANOVA conducted on these measures for the five groups (AVA+, AVA-, TVA+, TVA-, TY) does not show any significant differences (for FOMs: $H(4) = 1.84$, $p = .76$; for SOMs: $H(4) = 3.55$, $p = .47$, both 1-tailed).

Children's justifications

The mean rate of children's justifications in FOMs (range: 9-61%) is different for the five groups. The Kruskal-Wallis one-way ANOVA conducted on this measure reveals a significant group effect ($H(4) = 11.44$, $p = .011$, 1-tailed). Post-hoc comparisons using the Mann-Whitney test (with the Bonferroni adjustment of the alpha level: $\alpha = .05/3 = .017$) show that ASD children with lower verbal age (AVA-) justify their FOMs significantly less than their verbally-matched typical controls (TVA-) (M = 9% vs. 51%, $U = 2$, $p = .016$, 1-tailed), and marginally significantly less than the TY group, (M = 9% vs. 28%, $U = 4$, $p = .048$, 1-tailed) and verbally more advanced ASD children (AVA+) (M = 9% vs. 61%, $U = 2$, $p = .03$, 1-tailed). It is interesting to note that all typical 2-year-olds produced at least some justifications of FOM (at least 3 per child), whereas three of the five AVA- children produced none at all. The comparison between AVA+ and their verbally-matched controls (TVA+) does

not show significant differences ($U = 5, p = .075$, 1-tailed).

Regarding children's justifications of SOMs, the Kruskal-Wallis one-way ANOVA applied to this measure again shows a significant group effect ($H(4) = 9.02, p = .031$, 1-tailed). Post-hoc comparisons tested with the Mann Whitney test (with the Bonferroni adjustment of the alpha level to .017) indicate only a marginally significant difference between AVA+ children and their verbally matched typical controls, with the former producing less justifications of SOM than the latter (M = 15% vs. 37%, $U = 4, p = .048$, 1-tailed).

Comparison between children's and partners' justifications

A Wilcoxon signed-rank test was conducted to compare the effect of speaker (child or partner) on the production of justifications. Results show that children justify their FOMs less than their partners ($Z = 3.24$, $p = .001$, 2- tailed). Concerning justifications in SOMs, we find again that children justify less than their partners ($Z = 3.65, p=.0003$, 2-tailed).

Insistence after the first oppositional movement

Overall Insistence by children and partners

The general insistence of the interlocutor after the FOMs of the other speaker was calculated. For the children, this measure is provided by the proportion of the partner's FOMs (justified or not), that gives rise to the child's insistence. For the

partners, this is provided by the children's FOMs that give rise to the partner's insistence. The Kruskal-Wallis one-way analysis of variance revealed no significant difference among the groups in the children's rate of insistence (see Table 4) ($H(4) = 3.35$, $p = .50$, 2-tailed).

[Insert Table 4 about here]

The same finding holds for the partners' rate of insistence ($H(4) = 4.04$, $p = .40$, 2-tailed). Partners, however, insist significantly more than the children (Wilcoxon signed-rank test, $Z = 2.89$, $p = .003$, 2-tailed).

The persuasive effect of justifications

Effect of the partner's justifications on the child: Index of Pragmatic Comprehension

In order to understand whether the partners' justifications of FOMs have an immediate persuasive effect on the children, the child's rate of insistence after their partner's justified FOMs was compared to that occurring after FOMs that were *not* justified. This analysis provides an *index of pragmatic comprehension*, that is, a rough measure of children's comprehension of the pragmatic value of justifications offered by the partner. If the justification has a persuasive effect on the child, his insistence rate should be lower after justified FOMs than after unjustified ones (Veneziano, 2001, 2010).

A Wilcoxon signed-rank test conducted on the whole sample confirmed the existence of this effect: children insist significantly less after justified than after unjustified FOMS from their partners (respectively M= 29% vs. M= 50.5%, $Z = 3,32$,

$p = .0005$, 1–tailed[5]).

Figure 2 presents, for each of the five groups, the children's mean insistence rates after justified or unjustified FOMS of the partner. The three groups of children with lower verbal age, whether autistic or typically-developing (TY, TVA- and AVA-), insist significantly less when the partner justifies his/her FOMs than when s/he does not, resulting in a higher immediate acceptance of the partner's position by the child.

[Insert Figure 2 about here]

In AVA- children, the mean rate of insistence after justified FOMs is 28%, and after unjustified FOMs is 60% ($Z = 2.02$, $p = .021$); in TVA- children, the difference in mean rate of insistence is, respectively, 26% vs. 57% ($Z = 2.02$, $p = .021$); and in TY children, 24% vs. 48% ($Z = 1.75$, $p = .04$). This effect is not found in children with a higher verbal age, both ASD and typically-developing (AVA+ and TVA+). In the AVA+ group, children are just as likely to insist after justified and unjustified FOMs of their partners (the mean rate of insistence is 35% vs. 33% for AVA+, $Z = 0.67$, $p = .25$); and in the TVA+ group, the difference is in the expected direction (28% vs. 52%), but does not reach significance ($Z = 0.94$, $p = .17$) due to substantial individual variability.

Effect of the child's justifications on the partner: Index of Pragmatic Impact

[5] For all the following analyses, one-tailed tests were used since directional hypotheses were tested (mean insistence rate after justified FOMs < mean insistence rate after unjustified FOMs)

The same method as that applied above was used to check whether children's justifications of FOMs have an immediate persuasive effect on their partners. Again, the Wilcoxon signed-rank test, conducted on the whole sample, shows an overall difference: partners insist significantly less after justified than after unjustified FOMs of their children (respectively 35% vs. 59%, $Z = 2.13$, $p = .016$). Figure 3 shows the mean rate of immediate insistence by the partner after justified and unjustified FOMs of their children, for each of the five groups.

[Insert Figure 3 about here]

In the AVA- group, only 2 children produced any justified FOMs and, for both, their persuasive impact on their partners was in the expected direction (respectively 33% vs. 45% and 50% vs.71%). Due to the reduced size of the sample, Wilcoxon signed-rank test does not show a significant difference ($Z = 1.34$, $p = .09$). In the TY group, the mean rates of insistence differ significantly in the expected direction (29% vs. 56%; $Z = 1.75$, $p = .04$). Also in the TVA- group, the difference in the mean rate of insistence is in the expected direction (12% vs. 71%) and shows a strong tendency but does not reach the 5% level of significance ($Z = 1.46$, $p = .07$). One child of this group always justified his FOMs, making the comparison impossible. Among the other four children, three present a profile in the expected direction and one in the opposite one.

In the TVA+ group, the mean difference between partners' insistence after justified and unjustified children's FOMs is relatively small, (51% vs. 62%) and not significant ($Z = 0.40$, $p = .34$). In the AVA+ group, there is practically no difference (43% vs. 44%) ($Z = 0.13$, $p = .45$). It is interesting to note, however, that partners in

the AVA+ and in the TVA+ groups present greater variability than partners in the lower verbal age groups. Indeed, in each of these groups, three families present a profile in the expected direction and two in the opposite one.

Discussion

The present study documents detailed pragmatic functioning of ASD children and of their partners in the negotiation of oppositional episodes, a domain for which no data were hitherto available. ASD children were distinguished according to their verbal age and compared to controls matched in verbal age. The study has dealt with a very large number of episodes, all occurring naturally in familiar interaction in the children's home environment. Focusing on the same communicative act (opposition to the interlocutor), and using a method that allies qualitative to quantitative analyses, we were able to show the existence of both similarities and differences in the pragmatic functioning of families with an ASD child and families with typically-developing children. Both types of families produced about the same number of oppositional episodes, which were also comparable in length and in the proportion of conflictual episodes. These similarities were found regardless of the verbal age of the children (2, 3-4 and 6-7 years). This finding is interesting as we may have expected a difference in families with an ASD child on the basis of reduced communicative engagements from children and parents, or on the basis of repetitive communicative dysfunctions. ASD children were found to engage as much as typically-developing children in oppositional episodes and to have as many opportunities to practice socio-cognitive and culturally-valued behaviors such as justifications, a finding in harmony

with results obtained by Ruble (2011) on other interactional measures. Thus, differences in the unfolding of oppositional episodes found between families with an ASD child and families with typically-developing children are genuine differences in pragmatic functioning that cannot be ascribed to differences in the opportunities children have to deal with the targeted communicative act.

In addition, the partners' rate of justification of oppositions was very similar in the five groups, a finding in line with results obtained by Venuti et al. (2012) on the functional analysis of mothers' utterances. However, in our study, differences may exist in the nature and diversity of the justifications provided, an aspect that is under investigation. Another element of similarity among the groups is the overall rate of immediate insistence by partners and by children and the fact that, in all five groups oppositions were more frequently initiated by the partners than by the children.

Our results revealed differences as well. ASD children with a verbal age of 3-4 years (AVA-) produced very few justifications or none at all, thereby differing significantly from their verbally-matched controls (TVA-) as well as from younger typically-developing 2 year-olds. This finding may explain the fact that, in our sample, partners of AVA- children present the highest rate of insistence. Should this result be confirmed, it may mean that partners of these children do not have at their disposal sufficient cues to interpret the reasons of children's oppositions, which being the lack or scarcity of justifications.

These results support findings of earlier studies on the discrepancy between "form" and "function" (Tager-Flusberg, 1994; Carpenter, Pennington & Rogers, 2002;

Camaioni et al., 2003; Volden et al., 2009). One could surmise that it is the socio-communicative function of justifications that ASD children with lower verbal age do not seem to understand well. These children may have difficulties appreciating when their interlocutors do not share the same mental attitudes. When this is the case, they do not realize well that language can be used to express the internal motivations of behaviors, Particularly, with a justificatory function, this kind of speech has potential persuasive consequences, and can bridge the gap between minds (Dunn, 1993; Veneziano, 2001). In contrast, the verbally more advanced ASD children (6-7 years) produced as many justifications as their verbally-matched controls, seemingly grasping the pragmatic usefulness of providing a justification in cases of disagreement, as well as the implicit social rules that govern the expression of oppositions (Heritage, 1988). We would like to emphasize that this is in itself a very important finding that might be in line with other results based on a Vygotskyan approach (Walker & Berthelsen, 2008; Harrop et al., 2012). It provides interesting indications that ASD children become able to understand subtle socio-cultural practices, such as the necessity to account for their oppositional behaviors. This practice is well modeled by their partners who, like partners in the other families, justify their oppositional behavior at a high rate. However, it cannot be seen as the mere mimicking of heard behavior. Indeed, the functional meaning of justifications must be retrieved with respect to the particular functional relation that a justification holds with the behavior to be accounted for. Children with autism seem to be able to understand this relation, to internalize it, and to comprehend the socio-cultural necessity to reproduce it. The nature of these accounts and the individual variation of

this knowledge should be further investigated in future research.

Concerning the effect of partners' justifications on the children, verbally less advanced ASD children (AVA-) are similar to verbally-matched controls and to typical 2-year-olds, in that the partners' justifications lead them to accept their partner's opposition sooner in the episode, thus avoiding longer conflictual episodes from taking place. This effect is not found in the two verbally-more advanced groups, whether ASD and or typically-developing (AVA+ and TVA+).

Concerning the pragmatic impact of children's justifications in FOMs, partners of verbally less advanced typical children are more likely to accept immediately the child's opposition when it is justified than when it is not (significantly in TY and with a tendency in TVA-). The results concerning the AVA- group are difficult to evaluate given that only two children provided justifications in their FOMs, and only in small number. This issue needs thus to be reconsidered with a larger amount of interactional data. In the verbally more advanced groups (TVA+ and AVA+), the pragmatic impact of children's justifications on their partners is less consistent across families.

How might we explain why partners' justifications do not have an immediate effect on verbally more advanced children? We may suppose that progress in verbal abilities modifies the capacity of children to persist in their intentions as well as to react back to the partner's interventions, and thus modifies the overall dynamics of the interaction. Confronted with the justifications of their partners, instead of accepting the latter's position, children may rather tend to use counterarguments or to reinstate one's own position, whether accompanied by a justification or not. Partners

of AVA+ children may raise their expectations (Wood, Bruner & Ross, 1976) towards justifications of the children and may employ counterarguments or solicit other, better-adapted justifications from the children.

Despite some similarities between AVA+ and TVA+ groups, should we presume that the above-mentioned mechanisms are at work in a comparable way in AVA+ and TVA+ families? The interpretation provided above finds some support in the results of the TVA+ families. TVA+ children have the highest mean rate of justifications in subsequent oppositional movements (SOMs) — 37% — a rate which is very similar to that of the partners (38%). In contrast, for AVA+ children, the mean rate of justifications in SOM —15% — although higher than that of AVA- and of 2-year-olds, is not higher than that of TVA- children, and is quite lower than the corresponding rate of their partners. The similarities between AVA+ and TVA+ families on measures relating to the effect of partners' justifications on the children and in the intraindividual variability observed for the immediate effect of children's justifications on the partners, may in fact hide qualitative differences in the dynamics of the interaction that goes on in the child-partner dyads. AVA+ children, although they seem to have understood the pragmatic necessity of justifications in oppositional contexts, may not sufficiently adapt their justifications to the communicative situation at hand, which could, in turn, lead to partners' difficulties in interpreting their children's communicative intentions. TVA+ children may instead be more able to hold and to insist on their position by producing counterarguments after their partners' justifications of FOMs.

Future research should concentrate on individual variation in the use of

justifications and in their effects on the negotiation of oppositional episodes, analyzing larger samples of naturally-occurring interaction. Further attention should also be given to the interactional dynamics of the exchanges. The content of the justifications needs to be analyzed precisely, and the types of justifications distinguished, particularly on dimensions relevant for theory of mind (such as self or other-oriented, subjective or objective properties).

Given that socio-pragmatic difficulties could also be linked to general cognitive difficulties relating to executive functions and/or central coherence (Martin & McDonald, 2003; Noens & Van Berckelaer-Onnes, 2005; Plumet, 2011; Kissine, 2012), and that making sense of a justification requires the ability to relate it to the opposition, to the implicit social conventions that regulate behaviors, as well as to the overall context, future research should also analyze the degree of transparency of the relation between the opposition and its justification. It will be interesting to analyze, for example, the degree of explicitness of the link between the two components of the explanation (the opposition and its justification) or the presence of specific linguistic markers of causality between them. Moreover, the analysis of the interactional dynamics should be extended to take into account other dimensions of the unfolding of the episodes such as, for example, considering whether and to what extent adaptive changes, such as reformulations or the provision and the diversification of justifications, occur as a result of the reactions of the interlocutor.

On another level, individual family profiles need to be analyzed precisely. This will allow to identify variation in socio-pragmatic functioning, enabling a better account of the diversity of the specific mechanisms that regulate everyday interactions

according to the characteristics of the participants (such as the magnitude of the lag between the chronological and the verbal age of ASD children), and of the specificities of the situations. These lines of research will provide insightful information that will deepen our understanding of the typical and atypical aspects of the pragmatic functioning of ASD children, and help us identify more precisely areas for targeted interventions.

Another interesting issue that needs to be addressed in further research concerns the relationship between the way ASD children function in everyday communicative situations and in experimental settings. Research on ToM skills points to a décalage between the two in favor of experimental settings. That is, children's success of pragmatic tasks in experimental settings does not predict adequate functioning in real-life socio-communicative interactions that seem to imply similar kinds of skills (Fombonne, Siddons, Achard, Frith & Happé, 1994; Frith, Happé & Siddons, 1994; Leekam & Prior, 1994; Plumet & Tardif, 2003; Peterson, Garnett, Kelly & Attwood, 2009). However, these studies did not measure ASD children's everyday communicative functioning with diversified and fine-grained measures as those used here (see also, Veneziano et al., 2004, Veneziano & Plumet, 2009). These analyses allow a differentiated appraisal of children's practical understanding and "know how" about other people's intentional and epistemic states. Even if limited to the immediately present partner, the display of given behaviors provides essential information on the emergence and early development of components of Theory of Mind. Thus, to better elucidate this important issue, it will be most interesting to relate the results obtained with our methodological approach to results of a developmental

battery of mental understanding tests obtained on the same children, evaluating implicit and explicit skills, as well as the understanding of various types of mental states (perceptions, emotions, cognitions) (Plumet & Tardif, 2003). Moreover, extending the kind of analysis used in this study to other communicative acts such as *requests*—which, like oppositions, require children to draw on their socio-cultural, cognitive, and pragmatic competences to obtain satisfaction—would offer additional opportunities to test these relationships between socio-pragmatic functioning in everyday contexts and experimental measures of theory of mind.

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Table 1. Descriptive characteristics of the sample

		Chronological age in months			Verbal age in months (TVAP receptive subtest)		
Subgroups	N=	Mean	SD	Range	Mean	SD	Range
Children with AUTISM							
AVA- [3-4 yrs]	5	92.6	14.5	71-110	42	4.2	36-48
AVA + [6-7 yrs]	5	93.4	11.1	78-109	75.6	5.8	69-84
TYPICAL children matched for Verbal MA							
TVA- [3-4 yrs]	5	42.4	3.8	36-46	46.8	13	36-69
TVA+ [6-7yrs]	5	67.4	7.8	58-78	79.2	12.1	66-96
Younger TYPICAL children							
TY [2 yrs]	5	24	0	24	-	-	-

Table 2. Oppositional episodes in the three main groups: ASD, typically-developing verbal-age matched and 2 years old controls

	Children with AUTISM (n=10)	**TYPICAL children matched on verbal age (n=10)**	**TYPICAL 2 year olds (n=5)**	Total	*Kruskal-Wallis Statistics H / df=2*
Number of Oppositional episodes	378	455	232	1065	
Number of Turns in oppositional episodes	1597	1856	924	4377	
Mean number of oppositional	Mean (SD)	Mean (SD)	Mean (SD)	Mean	
episodes by hour:	35.5 (11.4)	43.8 (16.05)	41.8 (10.4)	40.1	*H* = 1.68, *p*=.43, ns
- *Partner-initiated*	*23.2 (11.4)*	*29 (12.2)*	*28.4 (11.3)*	*26.5*	*H* = 1,51, *p*=.47, ns
- *Child initiated*	*12.3 (4.9)*	*14.8 (7.6)*	*13.4 (4.76)*	*13.5*	*H* = 0,45, *p*=.80, ns
Mean percentage of conflictual episodes	40% (15)	39% (10)	36% (12)	39%	*H* = 0,55, *p*=.76, ns
Mean length of oppositional episodes (in turns)	4.19 (0.57)	4.07(0.36)	4.02 (0.61)	4.10	*H* =1,63, *p*=.47, ns
Mean length of conflictual oppositional episodes (in turns)	4.95 (0.81)	4.77 (0.51)	4.64 (0.81)	4.80	*H* = 1,18, *p*=.55, ns

Table 3. Rates of justifications of First Oppositional Movements (FOM) and of Subsequent Oppositional Movements (SOM) in the five groups: TY, TVA-, AVA-, AVA+

	Groups : Families with a					
	TYPICAL child TY (2year olds)	TYPICAL child TVA- (VA 3-4 yrs)	AUTISTIC child AVA- (VA 3-4 yrs)	TYPICAL child TVA+ (VA 6-74 yrs)	AUTISTIC child AVA+ (VA 6-7 yrs)	*Kruskal-Wallis Group effect H / df = 4*
FOM ***Partners***						
Mean %	70%	65%	62%	64%	58%	*H*=1,84 *p*=.76, ns
SD	18	13	14	10	13	
SOM ***Partners***						
Mean %	44%	34%	36%	38%	34%	*H*= 3,55 *p*=.47 ns
SD	8	17	16	7	25	
FOM ***Children***						
Mean %	28%	51%	9%	46%	61%	H=11,44 *p*=.011*
SD	10	31	12	15	28	
SOM ***Children***						
Mean %	10%	19%	9%	37%	15%	*H*= 9,02 *p*=.031*
SD	10	9	12	18	12	

Table 4. Rate of overall insistence after the First Oppositional Movement, in the five groups: TY, TVA-, AVA-, AVA+

	Groups : Families with a					
	TYPICAL child TY (2 year olds)	TYPICAL child TVA- (VA 3-4 yrs)	AUTISTIC child AVA- (VA 3-4 yrs)	TYPICAL child TVA+ (VA 6-74 yrs)	AUTISTIC child AVA+ (VA 6-7 yrs)	*One-way ANOVA Group effect*
Children						
Mean %	31%	39%	40%	33%	31%	*H* =3,35 *p*=.50 ns
SD	12	11	11	10	12	
Partners						
Mean %	46%	37%	64%	53%	40%	*H* =4,04 *p*=.40 ns
SD	15	23	24	18	18	

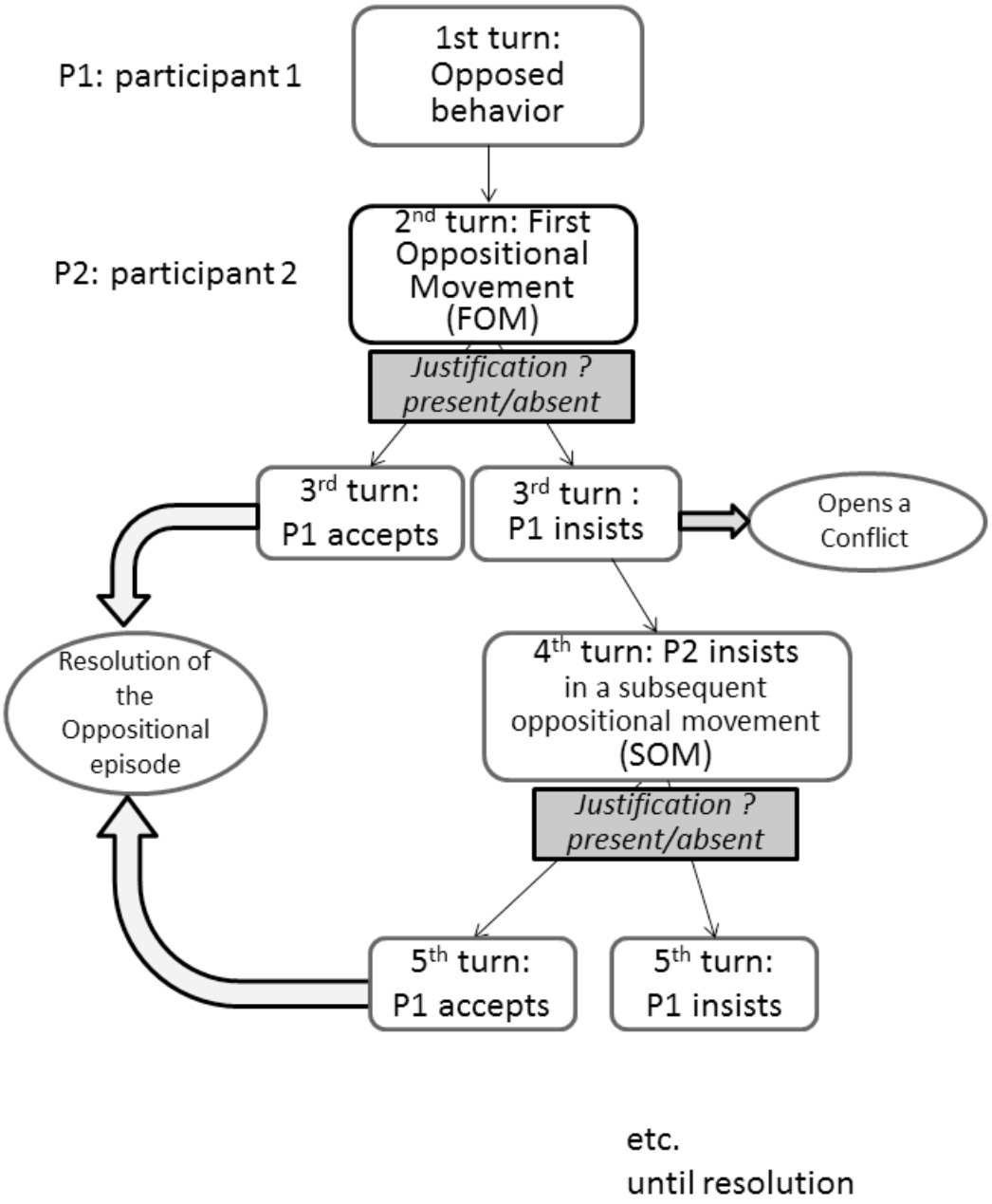


Figure 1. Schematic view of types of unfolding of oppositional episodes

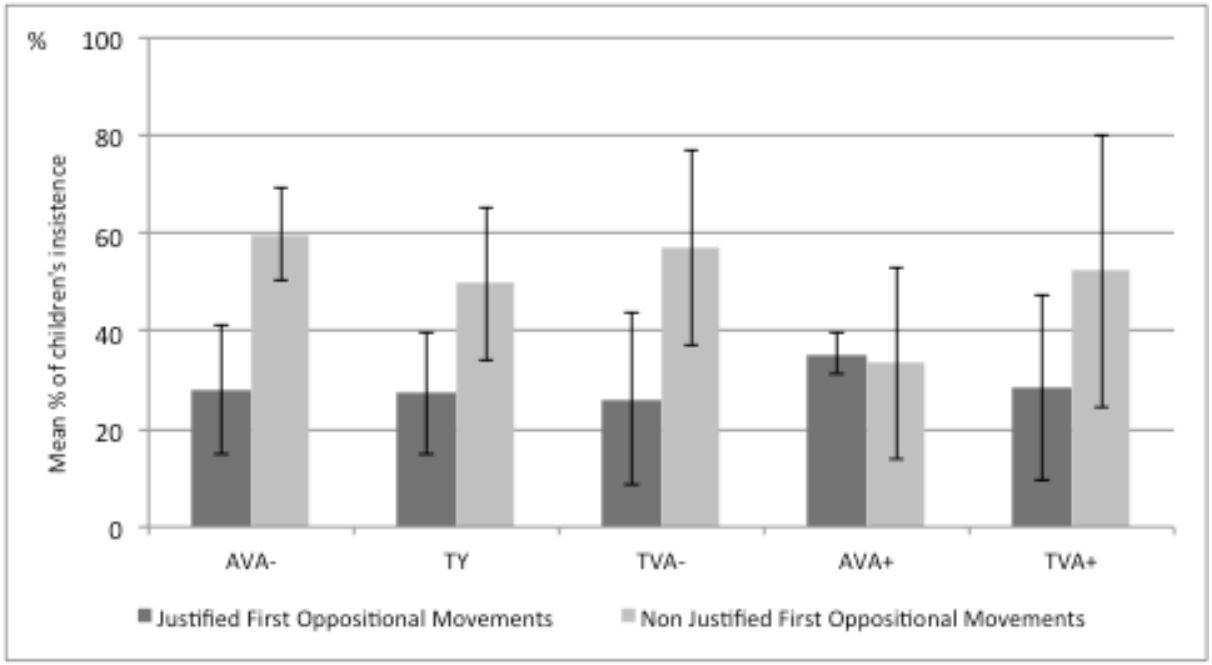


Figure 2. *Pragmatic Comprehension* of partners' justifications by children: Mean rate of insistence after justified and non justified First Oppositional Movements by partners

AVA-: autistic children with verbal age 3-4 yrs; TY: Young typical children (2 yrs);
TVA-: typical children with verbal age 3-4yrs; AVA+: autistic children with verbal age 6-7 yrs;
TVA+: typical children with verbal age 6-7yrs

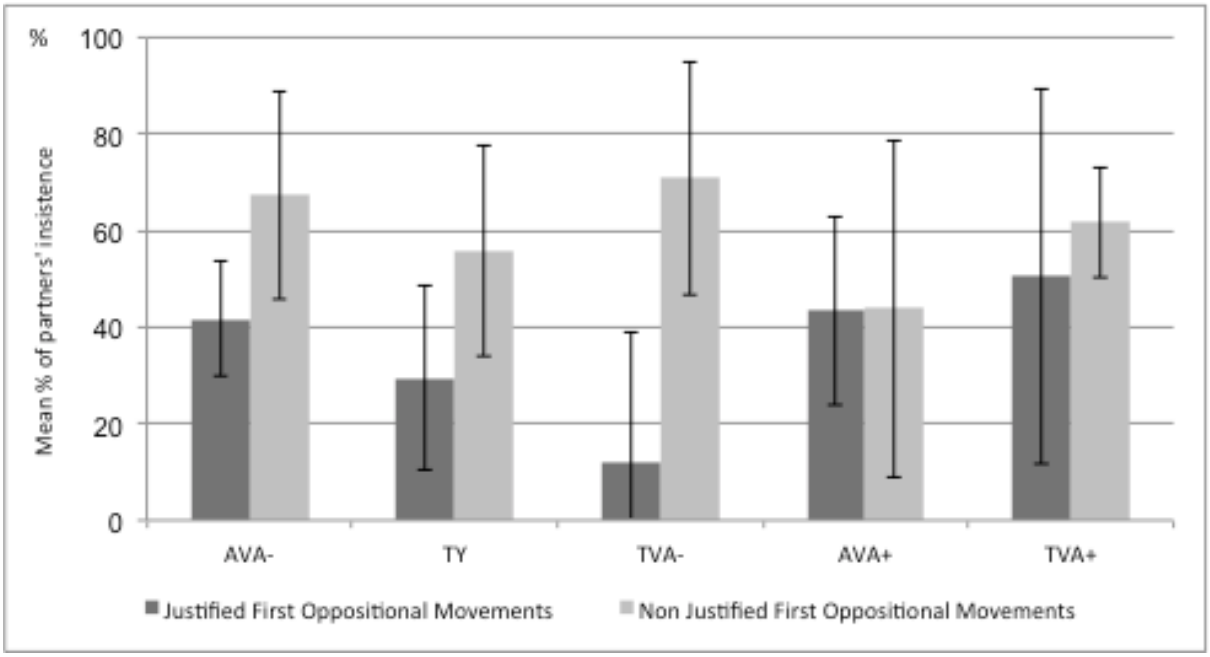


Figure 3. *Pragmatic Impact* of children's justifications on partners: Mean rate of insistence after justified and non justified First Oppositional Movements by children

AVA-: autistic children with verbal age 3-4 yrs; TY: Young typical children (2 yrs); TVA-: typical children with verbal age 3-4yrs; AVA+: autistic children with verbal age 6-7 yrs; TVA+: typical children with verbal age 6-7yrs