

Personal Pronouns and Communicative Engagement in Autism

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Abstract In three experimental conditions, we tested matched children with and without autism ($n = 15$ per group) for their comprehension and use of first person plural ('we') and third person singular ('he') pronouns, and examined whether such linguistic functioning related to their social interaction. The groups were indistinguishable in their comprehension and use of 'we' pronouns, although within each group, such usage was correlated with ratings of interpersonal connectedness with the collaborator. On the other hand, participants with autism were less likely to use third person pronouns or to show patterns of eye gaze reflecting engagement with an interlocutor's stance vis-à-vis a third person. In these settings, atypical third person pronoun usage seemed to reflect limited communicative engagement, but first person pronouns were relatively spared.

Keywords Autism · Personal pronouns · Deixis · Eye gaze · Social interaction

Introduction

Among the clinical features of children with autism, one situated at the interface between social-relational and linguistic functioning has provided an especially rich topic for clinical speculation and (to a lesser degree) empirical

investigation: the children's understanding and use of the personal pronouns 'I' and 'you'. Here we designed a series of experiments to test children's comprehension and use of first person plural and third person singular pronouns. Our aim was not only to investigate these specific elements of language ability among children with autism, but also to explore how far the children's linguistic functioning might correspond with specific aspects of their non-verbal interpersonal relatedness and communication. Our broader theoretical purpose was to elucidate the nature and potential limitations of the children's communicative engagement.

In his original description of the syndrome of autism, Kanner (1943) wrote as follows: '*Personal pronouns are repeated just as heard*, with no change to suit the altered situation. The child, once told by his mother, "Now I will give you your milk", expresses the desire for milk in exactly the same words. Consequently, he comes to speak of himself always as "you", and of the person addressed as "I". Not only the words, but even the intonation is retained' (p. 244). Subsequently, Bosch (1970) provided rich clinical illustrations of atypicalities among individuals with autism not only in the use of 'I' and 'you', but also in the way they may refer to themselves as 'he/she' or by personal name.

A study by Lee et al. (1994) included an interview in which teachers who were well acquainted with participants were asked whether currently, each of their pupils had difficulties in the comprehension and/or production of the pronouns 'I' and 'you'. The results were that two independent teachers agreed that 17 out of 25 children with autism *sometimes* confused personal pronouns in everyday life, a phenomenon that was never observed among mental age-matched children without autism. In recordings of the speech of younger children, Tager-Flusberg (1989)

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reported that 12% of instances of pronoun use in young children with autism resulted in pronoun reversal errors, for example when the children asked questions as if their mother was speaking, whereas such errors were not a feature of the language of matched children without autism. Therefore one needs to reconcile how children show instances of atypical usage, while on other occasions they appear to use personal pronouns perfectly well.

Such descriptions of atypical personal pronoun use among children with autism have been supported and refined by experimental evidence. Jordan (1989) reported that in a semi-structured game in which a tester asked questions about what happened, children with autism differed from matched children without autism in their greater tendency to employ proper names, rather than ‘I’ or ‘you’, in exchanges with the tester. When they employed first-person pronouns to refer to themselves, they tended to say ‘I’ rather than ‘me’. Similarly, Lee et al. (1994) reported that children with autism were less likely than verbal mental age-matched children without autism to use ‘me’ when asked ‘Who can see the X?’, instead tending to say: ‘I can see the X’, perhaps as a formulaic utterance. In two different experiments, lower ability children with autism more often used proper names for themselves and the experimenter (rather than say ‘me’ or ‘you’) when the latter asked them to say who was depicted in photographs.

There have been alternative explanations for atypical personal pronoun use among children with autism. Developing Kanner’s (1943) line of thought, Bartak et al. (1975) considered that reversals in the children’s personal pronouns might be explained as a tendency to echo the final part of utterances they hear, rather than a reflection of their atypical experience of self-other relations. Fay (1979) adopted an eclectic position in arguing that the children’s confusions with personal pronouns might reflect multiple and diverse difficulties of a social, cognitive, and grammatical kind. On the radical social-developmental pole of this debate, writers such as Bosch (1970), Charney (1981), and Hobson (1990, 1993) have interpreted *both* echolalia *and* abnormalities in personal pronoun usage as meaningful expressions of the children’s limitations in establishing a firm sense of self vis-à-vis others. Central to these writers’ proposal is that children with autism may fail to anchor utterances in the speech roles of people speaking because they do not *identify with* those others as speakers. As a result, they associate other people’s utterances with the situations in which they are produced, rather than understanding them as person-anchored speech acts which they can appropriate for themselves. Therefore, on the basis of hearing other people using the pronouns (and this would include hearing others speaking to each other: Oshima-Takane and Benaroya 1989), children with autism betray inconsistency in adopting appropriate personal pronouns

such as ‘I’/‘you’ or ‘my’/‘your’ in accord with the stance of the speaker, and then using these terms to express meanings from their own point of view.

It is this latter thesis concerning the psychological basis for personal pronoun usage—namely linkage and differentiation between the stances and speech roles of speakers and listeners—that provides the bridge between the studies already cited and the present investigation of the pronouns ‘we’ (potentially, an index of linkage between people) and ‘he’ (potentially, an index of linkage between a communicative partner about a third person).

There are three approaches that hold special promise for elucidating whether limitations in self/other experience and communicative role-taking may be responsible for personal pronoun difficulties among children with autism. Firstly, one can investigate conditions other than autism in which children’s confusions in the comprehension and/or use of personal pronouns appears to be related to social impairment—and here congenital blindness holds special interest (e.g., Fraiberg 1977; Brown et al. 1997; Hobson 1993). Secondly, one can determine whether the boundaries of the children’s abnormality in linguistic understanding and use correspond with those anticipated from a social-communicative account, for example in relation to deictic terms such as ‘come’ and ‘go’ that also reflect self/other role-reversing abilities (Bartolucci and Albers 1974; Hobson et al. 2009).

Thirdly—the approach adopted in the present study—one can test whether, *within* a group of participants with autism, individual differences in personal pronoun usage correspond with individual differences in critical aspects of social relatedness. To our knowledge, there has been just one prior experimental study of this kind. Loveland and Landry (1986) reported that correct production of I/you pronouns by children with autism was related to an *extra-linguistic* propensity, namely the number of spontaneous initiations of joint attention they made towards an investigator. This study provided direct evidence that among individuals with autism, personal pronoun usage may be related to *extra-linguistic* propensities to engage with other people.

In evaluating alternative theoretical perspectives, it is important to consider the typical development of personal pronoun comprehension and use. Young children’s understandings appear to represent an initially partial and then increasingly firm grasp of meanings. In the case of third person pronouns, for example, it seems that not until middle childhood do children achieve a full understanding that these pronouns apply only to non-addressed listeners, and never to addressees (Brenner 1983; Scholes 1981). Errors in usage may represent the systematic application of atypical linguistic contrasts and/or a focus on aspects of language other than those that shift according to people’s

stances within speech roles (e.g., Chiat 1981, 1982; Clark 1978). For the present purposes, the most important evidence concerns the timetable of children’s use of first person plural (‘we’) and third person singular (‘he’) pronouns, and here the evidence is that many children are already using these terms by the around the age of 3 years (data collated by Owens 2001, in Table 9.5, p. 300; Goodenough 1938; Nelson 1975; Charney 1980; Girouard et al. 1997, 1999). Charney (1981) has argued that this early, correct use of personal pronouns is founded upon very young children’s experience and recognition of what is shared and what differentiated in the psychological orientations of self and others, so that they can anchor meanings in speech roles even when they apply the terms in a restricted way (e.g., for a while, only using ‘my’ in relation to themselves).

Hypothesis and Predictions

In the present study, where our focus was on the relation between social and linguistic functioning among children with autism, we studied aspects of non-verbal communication in tandem with patterns of personal pronoun use. The aim was to determine how far participants’ use of ‘we’/‘us’/‘ours’ and ‘he’/‘him’/‘his’ in language are linked with expressions of interpersonal connectedness and non-linguistic reference to a third party, respectively.

Our hypothesis is that because of a relative lack of emotional engagement and identification with other people, children with autism have limited and partial experience of themselves as occupying a stance that is shared with yet differentiated from the stance(s) of others (e.g., García-Pérez et al. 2007; Hobson 1993, 2002/4, 2005; Hobson and Hobson 2007; Hobson and Lee 1999; Hobson and Meyer 2005; Hobson et al. 2007). Therefore we predicted that when compared with children without autism matched for age and verbal mental age, those with autism would be (a) less likely to employ first person pronouns ‘we’/‘us’/‘ours’ when asked about actions and perceptions they had shared with someone else, (b) less likely to look at their partner when asked questions that might elicit the words ‘we’/‘us’/‘ours’ (although we anticipated that looking to a questioner who occupied a ‘you’ role might be relatively spared), and (c) rated as showing less emotional connectedness with their partner during the tests in which they had a collaborator. In addition, we predicted that (d) on those occasions when participants were asked a question intended to elicit the production of ‘he’, they would have a lesser tendency to look towards the third person and then back to the questioner, shifting gaze to and from this shared referent in the context of sustained communication with the interlocutor.

We devised one situation in which the participant and partner sat next to each other and built a tower together,

another in which this same partner shared a visual perspective, and a final set-up in which the adult with whom the participant shared each of a series of visual perspectives shifted back and forth between testers as the task proceeded. We included two visual perspective-taking conditions because there is evidence that children with autism are relatively adept at this kind of role-taking (Hobson 1984; Leslie and Frith 1988). In such tests, group differences in the comprehension and use of ‘we’ are unlikely to arise from difficulties in visual perspective-taking per se. We systematically varied the tester who asked questions of each participant, in order to elicit first, second, and third person pronouns in participants’ replies.

Method

Participants

Fifteen children and adolescents with autism and 15 children and adolescents with learning disabilities but not autism nor other specific diagnoses participated in this study. Participants were closely matched for chronological and verbal mental age. Their characteristics are presented in Table 1.

All participants in the group with autism displayed the patterns of impairment in social interaction and communication, coupled with repetitive or stereotyped interests and activities, characteristic of autism. We confirmed that they fulfilled diagnostic criteria by completing the Childhood Autism Rating Scales (Schopler et al. 1988) on the basis of observations of the participants in their classroom settings. Their scores on this measure were $M = 32$, $SD = 2.6$, range = 30–39, where a score of 30 or above is taken to indicate autism. To supplement our own clinical judgements that the qualities of the children’s social and non-social impairments were characteristic of autism, we interviewed participants’ teachers in order to complete a checklist of clinical features based on DSM-IV criteria (American Psychiatric Association 1994).

Participants with and without autism were matched according to chronological age and scores on the British Picture Vocabulary Scales (BPVS; Dunn et al. 1982), the British version of the Peabody Picture Vocabulary Scale.

Table 1 Participant characteristics

	Chronological age			Verbal mental age		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Autism (<i>n</i> = 15)	14;8	2;8	9;1–18;11	6;6	1;6	4;7–8;11
Control (<i>n</i> = 15)	14;8	2;6	11;7–17;11	6;4	1;8	4;0–9;0

Ages presented in ‘years;months’

The BPVS is a standardized, widely used measure of receptive vocabulary that also appears to assess a relative area of weakness for persons with autism (Jarrold et al. 1977; Lockyer and Rutter 1970). As seen in Table 1, verbal mental age, based on BPVS raw score age-equivalents, was closely similar in the group of participants with autism relative to the comparison group. In addition, BPVS verbal age-equivalents relative to chronological age was very similar in the participants with autism ($M = 45.1$, $SD = 10.2$, range = 30.4–64.2) and the learning-disabled (LD) comparison group ($M = 43.6$, $SD = 9.8$, range = 31.0–58.1). We selected a control group of participants with learning disability, rather than typically developing children, so that any group differences could be attributed to the diagnosis of autism rather than discrepancies in chronological age or language ability.

Procedure

The experimental procedure was designed to assess participants' production of personal pronouns of the first person plural ('we'/'us'/'ours'), and third person singular ('he'/'him'/'his'). There were also conditions intended to prompt the use of the pronoun 'you'. We conducted three tasks in which participants were tested individually by two familiar adults (E1 and E2, who had visited the schools as testers on a number of occasions) in a quiet schoolroom. Each participant collaborated with E1 in situations involving shared agency (Tower Task) and shared visual perspectives (Card Task), and then shared visual viewpoints with E1 and E2 in turn (Divide Task). During the tasks, participants were asked questions by *each* of the testers in a standardized format, so that speech roles shifted systematically.

Tower Task

The participant was seated beside E1 and directly across a table from a second investigator (E2), as shown in Fig. 1. A set of eight wooden blocks (four red and four blue) were arranged in front of E1 and the participant, and a similar pile of bricks (four yellow and four green) were placed in front of E2. E2 said, "Let's build a tower." E2 proceeded to build a tower, taking care to make his shorter and to complete his tower more slowly than E1 and the participant, who were building their tower together. E1 ensured that he and the participant worked together closely, but he avoided the use of personal pronouns. After the tower built jointly by E1 and the participant was complete, E1 reported, "That's finished." Several seconds later, E2 completed his own shorter tower and announced, "That's finished."

E2 and E1 then took turns asking two questions each regarding agency (who built?) and possession (whose

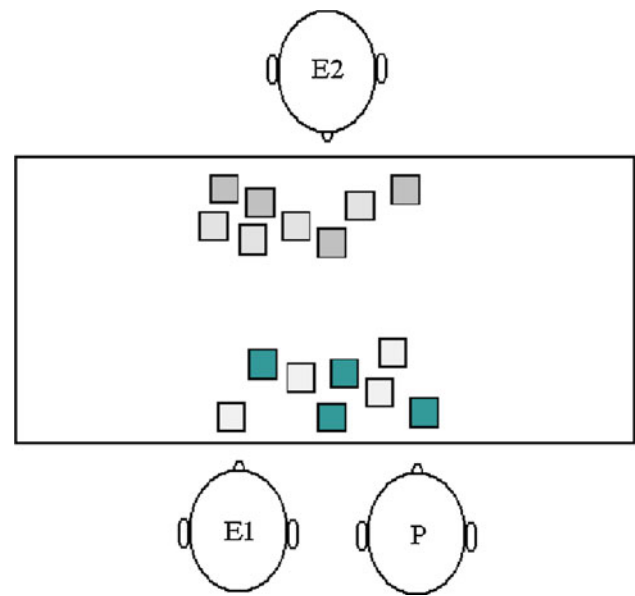


Fig. 1 The tower task

tower?). The questions are detailed in Table 2. Four questions concerned the tower completed by E1 and the participant (intended to elicit 'we', 'us', or 'ours'), two questions posed by E2 referred to his tower (intended to elicit 'you' or 'yours'), and two posed by E1 referred to the tower completed by E2 (intended to elicit 'he', 'him' or 'his').

In order to test participants' comprehension of the terms 'we' and 'he', as well as the names for the colours of the two towers, the above tests of pronoun production were followed by two comprehension questions asked by E1: 'What colour tower did we build?' (answer: red and blue), and, 'What colour tower did he build?' (answer: yellow and green). In order to confirm that the participants understood 'our' and 'his', as well as the relative size of the two towers, E1 also asked: 'Was our tower the smallest?' (answer: no), and, 'Was his tower the smallest?' (answer: yes).

Card Task

The participant was seated beside the first investigator (E1) and directly across the table from the second investigator (E2), as shown in Fig. 2. E2 introduced a 32 × 26 cm white cardboard sheet containing a 10 × 7 cm line drawing of a familiar object (a flashlight) on one side and a second drawing of a familiar object (a puppy) on the other. E2 established that the participant was able to name and recall the two objects on each side of the sheet. Next, E2 stated that it was important that E1 not answer the next two questions, and placed a piece of tape over his mouth to stop

Table 2 Questions and intended pronoun responses by task

	Question	Investigator asking	Person(s) to whom question refers	Pronoun response
The tower task	Who built the red and blue tower?	E1	E1 and participant	We
	Who built the green and yellow tower?	E1	E2	He
	So, who built the tower with the yellow bricks in?	E2	E2	You
	So, who built the tower with the blue bricks in?	E2	E1 and participant	We
	Whose tower was the tallest?	E1	E1 and participant	Ours
	Whose tower was the smallest?	E1	E2	His
	Whose tower was finished last?	E2	E2	Yours
	Whose tower was finished first?	E2	E1 and participant	Ours
The card task	Who can see the torch?	E2	E1 and participant	We
	Who can see the puppy?	E2	E2	You
	Who can see the teddy?	E1	E2	He
	Who can see the spade?	E1	E1 and participant	We
	Who can see the shoe?	E2	E2	You
	Who can see the umbrella?	E2	E1 and participant	We
The divide task	Who can see the scissors?	E1	E1 and participant	We
	Who can see the gun?	E1	E1	You
	Who can see the torch?	E2	E2 and participant	We
	Who can see the sunglasses?	E2	E2	You
	Who can see the gun?	E2	E1	He
	Who can see the sunglasses?	E1	E2	He

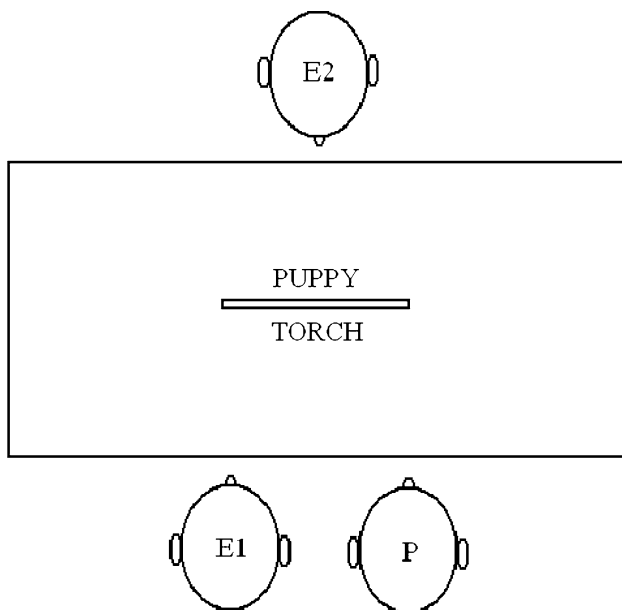


Fig. 2 The card task

him from talking. For each card, E2 held the sheet such that one side was in the full view of both E1 and the participant, and the other side was visible only to E2.

The questions intended to elicit personal pronouns are detailed in Table 2. For the two questions with the first

card only, E1’s mouth was taped to establish that it was up to the participant to provide answers to E2’s questions. These two questions from E2 took the form of, “Who can see the...?” and provided a participant with the first opportunities to use the pronoun ‘we’ and the pronoun ‘you’.

At this point, E1 removed the tape from his mouth. Prior to continuing with tests of production, we gave two tests of comprehension in which E1 asked what was visible to both the participant and himself, and what was visible to E2, when a new card was presented. The questions were, ‘What can we see?’ (answer: the drum), and, ‘What can he see?’ (answer: the hat).

There followed the remaining questions intended to elicit personal pronouns usage posed by E1 (two questions) and E2 (two questions), as indicated in Table 2. For each pair of questions, a new card was introduced, with the novel pictures on each side. Over the whole set of language production items of the Card Task, therefore, participants had the opportunity to respond three times with ‘we’/‘us’/‘ours’, twice with ‘you’/‘yours’, and once with ‘he’/‘him’/‘his’.

Divide Task

The purpose of this task was to assess participants’ use of personal pronouns in a game involving shifts in shared

visual perspective. The participant was seated at one end of a table, with E1 and E2 on either side, at right angles to the participant and opposite each other (Fig. 3). Four objects (a pair of sunglasses, a flashlight, scissors, and a toy gun) were placed in the compartments of a cross-shaped cardboard divider, so that each object occupied one compartment, and each person (i.e., the participant, E1, and E2, respectively) could see only two of the four objects. This arrangement is shown in Fig. 3.

To commence the task, E2 said, 'I can see the sunglasses and the torch', and E1 said, 'I can see the gun and the scissors'. E1 turned to the participant, and asked, 'What can you see?' (answer: torch and scissors). Almost all of the participants referred to both objects in their view, with the exception of one, a boy with autism, who labelled only one of the two.

Then E2 and E1 posed "Who can see ...?" questions in the order indicated on Table 2. In this case, there were two opportunities for participants to use 'we'/'us'/'ours', two to use 'you'/'yours', and two to use 'he'/'him'/'his'. It will be apparent from Table 2 that the person to whom a pronoun referred shifted systematically during the task.

To conclude, the testers asked the following comprehension questions:

E1: What can we see? (answer: scissors; or if inclusive of what the participant and E1 could see, also gun and/or torch)

E1: What can he see? (answer: sunglasses and torch)

E2: What can we see? (answer torch; or if inclusive of what the participant and E2 could see, also sunglasses and/or scissors)

E2: What can he see? (answer: scissors and gun)

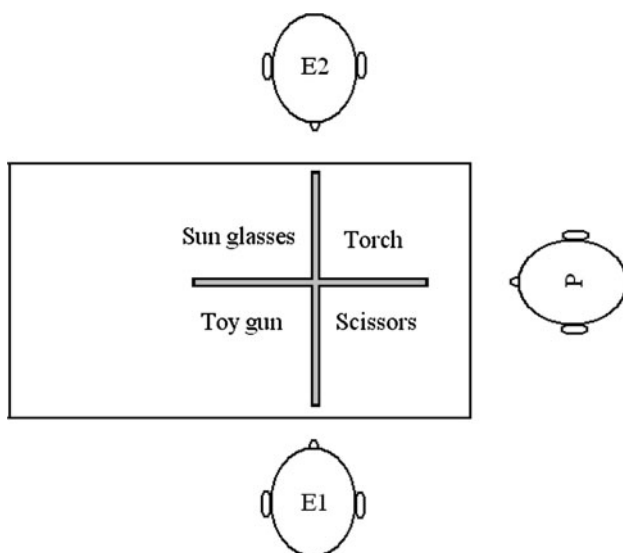


Fig. 3 The divide task

'We' in Relation

A naïve judge who was unaware of the hypotheses and predictions of the study, as well as blind to participants' diagnoses, conducted a set of ratings of the videotapes. First, the naïve judge watched all three tasks (Tower, Card, & Divide Tasks) and during each response to every pronoun question, rated the presence and directedness of looks to either one or both of the investigators. For one control participant, the looks could not be seen due to technical difficulties with E2's head blocking the participant's face, but this child's connectedness with E1 could still be rated.

Secondly, the rater watched the participants' interactions with E1 during the two tasks involving cooperation and partnership (the Tower and Card Tasks, considered together because in these tasks the same tester occupied the role of collaborator). Across the two tasks, she made a subjective judgement of the degree to which the participant conveyed a quality of engagement and interpersonal linkage with the partner in the tasks, and appeared to experience a joint stance or sense of togetherness that might find expression in mutual looks as the tasks progressed as well as signs of empathy when the tester removed the tape from his mouth. This rating was made on a 5-point scale, ranging from 'none' (score 0) to 'clearly present' (score 4), and will be subsequently referred to as a rating of connectedness.

A second judge, also blind to participant diagnoses, conducted the same set of ratings for 10 of the participants (5 in each group, 33% of the sample) for reliability ratings. Inter-rater agreement was $\kappa = .81$ for the presence and direction of looks, and $ICC = .65$ for degree of connectedness.

Finally, to remove the possibility that participants' use of personal pronouns contributed to ratings of connectedness, we asked two new raters to assess the videotapes of the Tower Task and the Card Task with the sound switched off. Although this was a crude measure of interpersonal connectedness, especially because information about voice intonation and the linguistic context of exchanges was missing, there was good inter-rater reliability in these ratings ($ICC = .96$).

Results

Tests of Comprehension

Overall, and with very few errors, all participants in each group showed they were able to comprehend the personal pronouns 'we' and 'he' in this setting. On the Tower Task, for example, all participants passed the two comprehension questions that contained the pronoun 'we'. On the Card Task, one participant from each group failed one of the two questions on 'What can we/he see?'. On the Divide Task,

where both E1 and E2 posed questions ‘What can we/he see?’, the groups were very similar in their responses. On the ‘we’ questions, it was variable whether participants named the one object that *both* they and the questioner could see or the three objects that *either* could see (with approximately half the participants with autism, and somewhat fewer than half of those without autism, responding in one of these ways), but only one or two participants in each group gave a response that was clearly incompatible with the (ambiguous) question. In the case of ‘What can he see?’, over two-thirds of each group answered each instance of this question by referring to both of the two objects seen by the third party, and again, clearly incorrect responses were very rare in either group.

Background to Predictions Concerning Personal Pronoun Use and Looks to the Testers

In order to assess the specificity of our findings concerning the use of the personal pronouns ‘we’/‘us’/‘ours’, as well as the linkage between responses to questions eliciting ‘he’ and looks to the testers, it was important to establish that the groups were similar in the use of *other* personal pronouns and *other* instances of looking to the testers in response to questioning.

In the case of personal pronoun use, the two groups were very similar in the frequency with which they used the pronoun second person pronoun ‘you’. On the six questions designed to elicit ‘you’/‘yours’, the numbers of these pronouns produced by participants with autism were $M = 5.13$, $SD = 1.68$, and those without autism $M = 4.67$, $SD = 2.06$, $t(28) = .68$, ns. Twelve out of 15 participants with autism, and 14 out of 15 without autism, used these terms on at least half the opportunities to do so. Therefore participants with autism were not failing to employ (nor avoiding) all forms of personal pronoun.

In the case of looking to the testers, participants of each group were similar insofar as they nearly always looked to a tester when he asked a question intended to elicit ‘you’ (i.e., a response that referred to the tester who asked the question): for numbers of looks out of six opportunities, participants with autism $M = 5.13$, $SD = 1.41$, participants without autism $M = 5.27$, $SD = 1.58$, $t(28) = .24$, ns. This confirmed there was not a tendency to ‘gaze aversion’ among participants with autism. Nor was there an overall group difference in the relatively rare event of a participant looking to *both* testers in response to the questions posed. Specifically in relation to the five questions in which the tester used the pronoun ‘he’, there was *not* a significant group difference in participants’ propensity to look at the third party to whom these questions referred (group with autism $M = 1.93$, $SD = 1.79$; comparison group, $M = 2.67$, $SD = 1.63$, $t(28) = 1.17$, ns).

Prediction 1: Use of First Person Plural Pronouns

Our first prediction was that the groups would differ in the propensity to use first person plural pronouns ‘we’/‘us’/‘ours’. This prediction was not borne out. Each participant was presented with a total of nine questions designed to elicit reference to the self in combination with another person, yielding a total of 135 responses per group. The results are presented in Table 3, and summarized along with additional details in Table 4. The results show a remarkably consistent pattern of group similarities. In particular, in response to the nine questions designed to elicit first person plural pronouns, participants with and without autism produced similar numbers of responses involving ‘we’/‘us’/‘ours’ (for participants with autism, $M = 2.33$, $SD = 2.32$, and those without autism $M = 2.60$, $SD = 2.41$, $t(28) = -.31$, ns). The group similarity applied, whether or not the questioner was part of the ‘we’ sharing in an action or a perspective, or the outsider. There was little to distinguish the groups in the use of alternative forms of first person pronouns, that is, ‘we’, ‘us’, and ‘ours’, as well as ‘me’, ‘my’, and ‘mine’.

From Table 4 it is apparent that the distribution of the ‘refer to both’ responses was very similar in the two groups. The one seeming exception, namely the responses referring to both participant and tester by name, all came from a single individual with autism. In the case of responses that referred to the participant’s self *only*, uses of personal names were rare in either group. Participants with autism made equal numbers of ‘me’/‘mine’ responses (25) and ‘I’ responses (25), whereas among participants without autism, the number of ‘me’/‘mine’ responses (30) were almost twice as many as ‘I’ responses (17).

Prediction 2: The Relation Between First Person Plural Pronoun Use and Looks to the Collaborative Partner

Here we had predicted that children with autism would contrast with those without autism in looking less to their partner when they were asked ‘we’ questions. It turned out that there were almost no instances of participants of either group looking to their partner when asked questions intended to elicit ‘we’: when the partner was the questioner, and when the other tester was posing the questions, instances remained rare (for participants with autism, $M = .26$, and for those without autism, $M = .20$). Therefore our method had elicited too few looks to a partner in *either* group to establish whether there might be a group difference in looking to the partner when using ‘we’/‘us’/‘ours’.

Prediction 3: Interpersonal Connectedness

We had predicted that children with autism would show less connectedness with their collaborator in the tests. As

Table 3 Distribution of responses to questions intended to elicit ‘we’ (selected from the items given in Table 2, in order)

Tower task	We question 1		We question 2		We question 3		We question 4		Total responses	
	Autism	Control	Autism	Control	Autism	Control	Autism	Control	Autism	Control
Personal pronoun	6	7	6	4	5	5	2	3	19	19
Other reference to both	2	1	1	2	4	3	4	1	11	7
Reference to self only	5	6	5	5	5	5	6	6	21	22
Reference to other only	1	1	1	4	1	2	3	4	6	11
Incorrect—refer to object or wrong person	1	0	2	0	0	0	0	1	3	1
Total	15	15	15	15	15	15	15	15	60	60

Card task	We question 1		We question 2		We question 3		Total responses	
	Autism	Control	Autism	Control	Autism	Control	Autism	Control
Personal pronoun	6	8	2	2	6	8	14	18
Other reference to both	3	3	3	2	3	1	9	6
Reference to self only	5	4	9	10	6	5	20	19
Reference to other only	0	0	1	1	0	1	1	2
Incorrect—refer to object or wrong person	1	0	0	0	0	0	1	0
Total	15	15	15	15	15	15	45	45

Divide task	We question 1		We question 2		Total responses	
	Autism	Control	Autism	Control	Autism	Control
Personal pronoun	2	2	0	0	2	2
Other reference to both	5	3	4	7	9	10
Reference to self only	5	8	5	2	10	10
Reference to other only	3	2	6	6	9	8
Incorrect—refer to object or wrong person	0	0	0	0	0	0
Total	15	15	15	15	30	30

Table 4 Responses to questions intended to elicit ‘we’ (total 135 responses per group)

	Autism	Control
Correct responses: refers to both		
We/Us/Our	35 (55%)	39 (63%)
I & You/Me and You/Me and Him/Mine and Yours	17 (27%)	17 (27%)
I/Me/Mine and E1 name	7 (11%)	6 (10%)
S name and E1 name	5 (7%)	0 (0%)
Total	64	62
Correct responses: refers only to self/other		
Me, I, My, Mine	50 (75%)	47 (65%)
Participant’s name	1 (1%)	4 (6%)
You/Yours (E1)	11 (16%)	10 (14%)
Him (E1)	0 (0%)	2 (3%)
E1 name	5 (8%)	8 (11%)
Point to E1	0 (0%)	1 (1%)
Total	67	72
Incorrect responses		
That (refers to object)	1 (25%)	0 (0%)
He (refers to E2)	1 (25%)	0 (0%)
You/Yours (refers to E2)	2 (50%)	1 (100%)
Total	4	1

anticipated, using the initial ratings of videotapes with sound available, there was a highly significant group difference in ratings of interpersonal connectedness during the partnership activities of tower building and viewing the pictures in the Card Task ($U = 47.00$, $p < .01$, two-tailed).

Although this group difference in interpersonal connectedness was not associated with the expected group difference in the frequency of children's use of first person plural pronouns (i.e., 'we'/'us'/'ours'), there was a positive relation between these variables *within* the group of children with autism ($\rho(15) = .88$, $p < .01$), and to just the same degree within the group without autism ($\rho(15) = .88$, $p < .01$). Frequency in the use of first person plural pronouns was not associated with BPVS scores for participants with autism, $\rho(15) = .11$, ns, whereas this correlation was significant for participants without autism, $\rho(15) = .60$, $p < .05$. The correlations between interpersonal connectedness and first person plural pronoun usage remained significant when variance associated with BPVS raw scores was taken into account (for participants with autism, $\text{partial-}r(12) = .82$, $p < .001$; for participants without autism, $\text{partial-}r(12) = .81$, $p < .001$). Inspection of the scatterplots confirmed that although the scores for connectedness were evenly distributed between 0 and 3 for participants with autism, and between 1 and 4 (mainly bunched between 2 and 3) for those without autism, there were few exceptions to the rule that that within each group, those with higher scores also showed more frequent use of 'we'/'us'/'ours'.

In the context of these findings, the question arose whether the measurement of interpersonal connectedness might have been influenced by the fact that participants' linguistic responses, including their use of personal pronouns, were included in the videotape recordings. When we repeated the analyses with data from the second set of videotape ratings that were made without access to sound, within-group correlation between ratings of connectedness and the frequency of use of first person plural pronouns remained significant for participants with autism ($\rho(15) = .55$, $p < .05$, two tailed, and taking account of BPVS scores, $\text{partial-}r(12) = .61$, $p < .05$), but not for those without autism ($\rho(15) = .42$).

Prediction 4: The Relation Between Third Person Pronoun Use and Looks to Both Testers

Our fourth prediction was that participants with autism would show fewer looks to both testers when one tester asked a question for which the correct answer involved reference to the other tester. There were a total of five questions designed to elicit reference to a third person ('he') who was either E1 when E2 asked, or E2 when E1

asked. The prediction was borne out: looks to *both* testers in response to these questions were few in number among participants with autism, but markedly more frequent among participants in the control group (group with autism $M = .40$, $SD = .91$; comparison group $M = 1.47$, $SD = 1.13$, $t(28) = 2.85$, $p < .01$). Twelve of the 15 participants with autism *never* looked to both testers on the five 'he' questions, whereas this was the case for just a single participant without autism (Fisher's Exact $p < .000$, two-tailed). Details of the results, which reflect a pattern consistent across each of the tasks, appear in Fig. 4. Our subjective impressions were that participants with autism seemed to 'forget' who asked the question, whereas those without autism often gave a strong impression of keeping the questioner in mind when responding.

These findings led us to examine whether there was a group difference in participants' use of 'he'/'him'/'his'. In the responses to the five questions, there was a significant group difference in the productive use of 'he'/'him'/'his' ($U = 58.50$, $p < .02$, two-tailed). The results appear in Fig. 5. There were only three out of 15 participants with autism who *ever* used the words 'he' or 'him', and each used the third person pronoun only once. This was despite the fact that all these participants indicated the third person correctly on the majority of trials (with only four incorrect responses), either by use of the person's proper name or, in eight instances, by turning to the third party and stating 'you'/'yours' (a response that also occurred three times among participants without autism). By contrast, the majority of participants without autism (9 out of 15) used a third person pronoun, and six used such a pronoun more than once. The group difference was derived from a pattern of responding that was consistent across all three tasks.

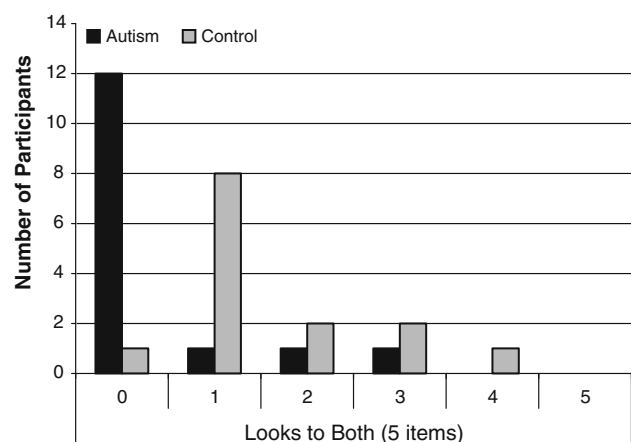


Fig. 4 Frequency of looks to both testers on the questions intended to elicit 'he'

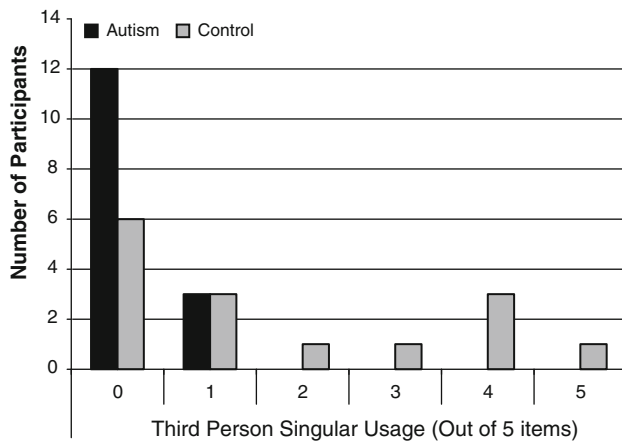


Fig. 5 Third person singular pronoun use in response to questions intended to elicit ‘he’

Discussion

This study yielded one result that was clearly out of keeping with our predictions. There was remarkable group *similarity* in the spontaneous use of the first plural pronoun ‘we’ and the alternative cases ‘us’ or ‘ours’. Less surprisingly, given the nature of the matching procedures and the relative high verbal ability of the children tested, this similarity extended to the use of ‘you’ to respond to an addressee, as well as to the use of ‘I’/‘me’/‘mine’ (although there was suggestive evidence that participants with autism might be using ‘me’/‘mine’ in a relatively lower proportion of their uses of first person pronouns). These results were not the outcome of ceiling nor floor effects, because there were a variety of responses to ‘we’ questions from participants of each group, and there was plenty of scope for group differences to emerge either in failures to make reference to the partner at all (whether or not through the terms ‘we’/‘us’/‘ours’), or in failures to employ first person plural terms.

A second prediction proved untestable because the method we employed was not effective in eliciting looks to the collaborator from participants in either group.

Then there were two respects in which our predictions were borne out. These concerned aspects of non-verbal communication. Firstly, on measures of interpersonal connectedness, unsurprisingly, participants with autism were rated as less connected with the tester with whom they were collaborating. Secondly, participants with autism were markedly less likely than those without autism to look to *both* the testers present, when one tester asked a question that concerned the other tester (i.e., a question intended to elicit a response containing the pronoun ‘he’). Not only this, but in marked contrast to group similarities in the use of both first- and second-person pronouns, and despite evidence that participants understood to whom a tester was

referring with the term ‘he’, there was a highly significant group difference insofar as participants with autism were less likely to employ the pronoun ‘he’ to communicate to one tester about the second tester.

Therefore in this setting and among the children with autism we tested, group differences in the spontaneous use of the pronoun ‘we’ did *not* reflect corresponding group differences in the children’s psychological connectedness with a collaborator. Yet *within* each group there was a similar positive correlation between the frequency with which participants used the pronouns ‘we’/‘us’/‘ours’, and ratings of interpersonal connectedness, and this was also the case for children with autism when ratings of connectedness were made using videotapes without sound. A possible explanation of this finding is that there might be some basis for children with autism to come to employ first person plural pronouns *other* than through interpersonal connectedness of the kind measured here—or alternatively, that only a small degree of such connectedness is needed to acquire such terms—but that over and above this, interpersonal connectedness remains a factor in determining whether these pronouns are employed. For example, it may be possible to learn the use of ‘we’ with relatively limited sensitivity or adjustment to speech roles, and perhaps without a full grasp of the meaning: ‘The other person(s) and I’.

It will require further research to establish whether in certain circumstances (such as those explored here), it is simply that one does not need joint experience, understanding or motivation to employ first person plural pronouns successfully, whereas in other settings, these factors assume greater importance. One way to proceed with such research would be to test for the use of such pronouns in a variety of contexts such as those involving shared attitudes. Another would be to study whether the development of the children’s comprehension and use of these words follows a similar or different path to that of children without autism. For example, it might prove to be the case that children with autism learn their use in settings of joint action rather than joint attention.

Evidence for a link between non-verbal communication and personal pronoun usage came from the data on the use of ‘he’. As predicted, when participants with autism made reference to a shared point of reference (a third person), their communication failed to include a look towards the third person and *then a look back to the tester with whom the communication was being shared*. This was complementary to the finding that there were only three out of 15 participants with autism who ever used the pronoun ‘he’, and then only once each.

There are three points to stress here. Firstly, it was not the case that the lesser number of looks to both testers in response to the ‘he’ questions reflected a lesser tendency to

look at the testers *tout court*. There were not group differences in the number of looks made to the testers at other points during the procedure, nor in looks towards the referent in response to questions where the questioner referred to ‘he’. Secondly, the *absence* of group differences in using ‘we’/‘us’/‘ours’ reveals that the results in the case of ‘he’ are not explicable in general terms such as a lack of productivity in personal pronouns. If these results on third person pronoun use were to be explained by some constraint in the application of grammatical rules in speech production—and from data on typical early development (Nelson 1975, p. 471; Table 3), it seems that the first production of ‘he’/‘him’/‘his’ occurs roughly in tandem with ‘me’, ‘us’/‘let’s’, and ‘we’—this would need to be very specific in nature, and the coincidental atypicalities in gaze would require explanation. Thirdly, it was not the case that participants with autism were unable to comprehend what a tester meant when he used the word ‘he’ in reference to a third person, at least in the highly constrained setting of the present tasks. It remains to examine whether this is true for other settings.

To assess participants’ use of third person pronouns, a tester asked a question about a third party; and the participant, either through verbal or non-verbal means, needed to sustain a communication with one tester about the other tester who was outside the immediate communicative act. It was the communicative frame and common ground (Clark 1996) involving two privileged communicators and one person shared between the communicators as a referent *external* to the two-person communicative event, that seemed to be sustained by most participants without autism, but lacking in the communication of nearly all participants with autism. Our preferred interpretation is that children with autism have a relatively weak propensity to identify with the attitudes of others, something critical for sustaining the motivational-cum-affective framework of a given communicative exchange (also García-Pérez et al. 2007; Hobson et al. 2007). Indeed, the dearth of looks back to the questioner among participants with autism in response to ‘he’ questions is strongly reminiscent of their paucity of ‘re-engagement looks’ to a tester under conditions that were designed to test manifestations of identification in coyness and guilt (Hobson et al. 2007).

Finally, it is important to recognize the limitations of the study. With regard to data suggesting group similarities on carefully structured experimental tasks, in this case tests of personal pronoun usage, one needs to be circumspect when the results may fail to reflect the difficulties faced by children with autism in more open-ended day-to-day communication. Moreover, the moderately sized groups comprised children with intellectual impairment, and therefore should not be considered to represent the full spectrum of children with autism, and specifically those with higher ability. Having said this, it is clear that the

children’s *proficiency* in many of the tests, and the specificity of the group differences that emerged, suggest that the findings are not attributable to overall levels of language ability. It would be interesting to explore whether individual differences in children’s performance on standardized tests of social engagement relate to personal pronoun usage, to complement the findings of correlations *within* the tasks reported here.

In summary, the present study has produced a set of novel findings that challenge a straightforward interpretation. Whereas it is plausible that the group differences in both verbal and non-verbal communication in response to questions designed to elicit ‘he’ might be interpreted to reflect contrasting structure in participants’ person-with-person communicative exchanges, such an account needs to be reconciled with the absence of group differences in the use of ‘we’/‘us’/‘ours’. Yet despite this negative finding, it was also the case that *within* the group with autism (and more equivocally, within the group without autism), there was a correlation between the use of such first person plural pronouns and ratings of interpersonal connectedness. The resolution of paradoxes presented by this intriguing pattern of results awaits further research.

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