Social conformity and autism spectrum disorder : a child-friendly take on a classic study

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Social Conformity and ASD: A child-friendly take on a classic study

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Abstract

Perhaps surprisingly, given the importance of conformity as a theoretical construct in social psychology and the profound implications autism has for social function, little research has been done on whether autism is associated with the propensity to conform to a social majority. The current study is a modern, child-friendly implementation of the classic Asch conformity studies (1952, 1956). The performance of 15 children with autism was compared to that of 15 typically-developing children on a line judgement task. Children were matched for age, gender, and numeracy and literacy ability. In each trial, the child had to say which of three lines a comparison line matched in length. On some trials, children were misled as to what most people thought the answer was. Children with autism were much less likely to conform in the misleading condition than typically-developing children. This finding was replicated using a continuous measure of autism traits, the Autism Quotient questionnaire, which showed that autism traits negatively correlated with likelihood to conform in the typically-developing group. This study demonstrates the resistance of children with autism to social pressure.

Key words

Conformity, children, autism spectrum disorder, Autism Quotient

Introduction

According to the American Psychiatric Association (2013) one of the key diagnostic criteria for autism is social impairments, including the inability to understand peer relationships and share others' interests. Thus, autism has profound implications for developmental processes, such as language acquisition, that are mediated by social interaction (Eigsti et al., 2011). One aspect of social function that has been widely studied within the field of social psychology, but which has received surprisingly little attention within the developmental arena is conformity. The perception of social pressure that leads to conformity is an essential influence on the formation and maintenance of social norms in the classroom and elsewhere (e.g., Chang, 2004). It is likely that the social impairments experienced by children with autism may hinder this perception, with potential consequences for behaviour.

Conformity has been most famously studied by Asch (1952, 1956) in a sequence of classic studies in which he asked adult participants placed amongst a panel of confederates to compare a stimulus line with three comparison lines of varying length. After hearing the confederates' responses (which were unanimously incorrect in 12 out of 18 trials), the participants had to publicly declare which line was the same length. Asch found that participants conformed to the panel and gave the incorrect response approximately a third of the time. Although Asch (1955) was concerned by this phenomenon, conformity is fundamental to group processes (see, for example, Bond and Smith's [1996] cross-cultural meta-analysis) and is necessary for effective socialisation. It has been found to be more visible in "collectivist" cultures (Bond and Smith, 1996) and occurs (albeit in an attenuated form) even in the absence of face-to-face contact (Cinnirella and Green, 2007).

More recent studies that have examined conformity have not used a panel of "lying" confederates. Instead, they have used a panel of peers who describe what they can

actually see. However, what these peers can see is different from what is seen by the person who is being observed (Mori and Arai, 2010; Hayanama and Mori, 2011; Haun and Tomasello, 2011). Mori and Arai (2010) argue that confederates often act unnaturally and that presenting the panel and participant with different images leads to more natural responses. Perhaps because of the difficulties in recruiting children for studies such as these, due to lack of ability or understanding, relatively few studies had been conducted looking at conformity processes in children until recently (e.g., Hayanama and Mori, 2011; Haun and Tomasello, 2011). Some of these studies have used stimuli with greater ecological validity than earlier studies. For example, Haun and Tomasello (2011) used three cartoon images of different sizes positioned on one page on a double page spread of a book. Another comparable picture was presented on the adjacent page. Four children, separated from each other by screens but able to hear one another, were told that one of the images had run to the other side of the page and were asked which one they thought it was. The children could respond either daddy (big), mummy (medium) or baby (little). Results showed that even Kindergarten children are not immune to social pressure. They gave the correct answer when unaware of the other children's responses, but tended to conform when they heard the other children give a different response.

While there is strong evidence that conformity processes are active from a young age in typical development, no study has yet looked at conformity in children with autism. It is feasible that susceptibility to social pressure would be weakened in autism, given the nature of the social difficulties shown. For example, from early in development, when compared with controls, individuals with autism exhibit impaired joint attention (Charman, 2003), less social interest (Swettenham et al., 1998) and reduced orientation to social cues, such as their name being called (Dawson et al., 2004). Weakened attention to social information (e.g. faces) has also been shown to persist into adolescence and adulthood (Riby and Hancock, 2009; Moore et al., 2012). This social disengagement may therefore mean that the thoughts of others, as expressed in a conformity task paradigm, lack salience and relevance for children with autism. The theory of mind difficulties characteristic of autism, as demonstrated in social-perspective taking tasks (e.g. the Sally-Ann task; Baron-Cohen et al., 1985), may also impede the perception of social pressure, resulting in a lack of conformity. Although social impairment is fundamental to a diagnosis of autism, there is individual variability in the pattern of social difficulties and how these difficulties manifest (Lombardo and Baron-Cohen, 2011). Thus, any study investigating this area would do well to include a continuous measure of autism traits such as the Autism Quotient (Baron-Cohen et al., 2001). Such a measure would reveal associations between the features of autism, particularly social aspects, and conformity. This would also establish whether such associations are present solely within diagnosed samples or extend into the general population.

The only study working explicitly within this conformity paradigm that has used participants on the autism spectrum is that of Bowler and Worley (1994). They compared adults with Asperger Syndrome with typically-developing adults and adults with mild learning difficulties matched for verbal IQ. Using the classic protocol of Asch (1952,

1956), they found that adults with Asperger Syndrome conformed less than the other two groups. However, this study had a number of problems. There were only eight to ten participants in any group, there were substantial age differences between the three groups, and the authors did not include any continuous measure of autism-spectrum traits.

In line with the findings of Bowler and Worley (1994), the aim of this study is to determine whether children with autism conform less than typically-developing children. A more ecologically valid adaptation of Asch's line study is used to assess levels of conformity. Cartoon shapes are used instead of plain lines to better engage children (Haun and Tomasello, 2011). To avoid the problems associated with confederates (Hanayama and Mori, 2011), this study does not use a panel (Cinirella and Green, 2007). Instead, the experimenter indicates what "the majority" of respondents have said. Additionally, the Autism Quotient (Baron Cohen et al., 2001) is used to determine whether conformity varies continuously with level of autistic traits in both the autism group and the typically-developing group.

Method

Participants

Initially, there were 32 participants who were recruited from three primary schools in the north of England. One child with autism did not successfully pass the practice trials stage of the study, so that child and their matched control were excluded from all subsequent analyses. Of the remaining 30 participants (28 boys and 2 girls), all participants were from year groups 2 to 6 (mean age = 9 years 1 month, SD = 1 year 5 months, range = 6 years 7 months - 11 years 4 months). Fifteen were children with high functioning autism, diagnosed independently by clinical psychologists (primarily using the Diagnostic Interview for Social and Communication Disorders; Wing, 2006). The other 15

participants were typically-developing children individually matched for gender, age, numeracy (mathematics ability), and literacy (writing and reading). Numeracy and literacy measures were taken from English National Curriculum assessments, in which children are assigned a level depending on how their performance compares to what would be expected for children of a particular age (e.g., level 1b represents performance that would be considered average for a five-year-old. 1c reflects below average performance, while level 1a represents above average performance. Level 2b represents average performance for a six-year-old, and so on.). For the purposes of matching, children's level was converted into a numerical value (see Table 1 for details of this process and for matching data). Gender was perfectly matched (14 boys and 1 girl in each group) and, although children with autism tended to have slightly lower National Curriculum assessment scores than their matched controls, independent t-tests revealed no significant differences between the two groups in any of the other matching variables (age: $t(28) = 0.19$, $p = .848$; numeracy: $t(28) = 0.75$, $p = .460$; writing: $t(28) = 0.97$, $p = .341$; reading: $t(28) = 0.92$, $p = .368$).

Table 1
Descriptive Statistics for Matching Variables

		Group	
Matching Variable		Autism	Typically developing
Age	Mean (SD)	9.17 (1.39)	9.07 (1.44)
	Range	6.92 - 11.33	6.58 - 11.33
Numeracy	Mean (SD)	7.53 (2.07)	8.20 (2.76)
	Range	4 - 11	4 - 14
Writing	Mean (SD)	6.47 (2.30)	7.20 (1.82)
	Range	3 - 10	4 - 10
Reading	Mean (SD)	7.00 (2.30)	7.73 (2.09)
	Range	3 - 11	4 - 11

Note. National Curriculum assessment levels were converted into numerical values as follows: 1c = 1, 1b = 2, 1a = 3, 2c = 4, 2b = 5, 2a = 6, 3c = 7, 3b = 8, 3a = 9, 4c = 10, 4b = 11, 4a = 12, 5c = 13, 5b = 14.

Scores from the Autism Quotient (Baron-Cohen et al., 2001) were used to confirm the validity of the two groups. Baron-Cohen et al. suggest that an AQ score of 32 or greater indicates a possible diagnosis of Asperger Syndrome or high-functioning autism.

Two members of the typically-developing group had scores above this threshold (scores of 34 and 36) and one member of the autism group had a score below this threshold (score of 29). Nonetheless, the typically-developing group still had a substantially lower AQ score (M = 15.87, SD = 8.53) than the autism group (M = 38.80, SD = 4.63), $t(28) = 9.15$, $p < .001$.

The participants were not matched for ethnicity but both groups were approximately equally mixed. Twenty-one were white British; six were of Pakistani descent, two were dual-heritage Afro-Caribbean English, two were of Somali descent, and one was of Yemeni descent. Permission to collect data was granted by the head teacher of the three schools after which consent was sought from the parents of the children via a letter, information sheet, and consent form sent to their home. This study was granted ethical approval by an ethics committee at Sheffield Hallam University.

Materials

Stimuli. In line with Haun and Tomasello (2011), this study used child-friendly equivalents of the plain line stimuli used by Asch (1952), which were presented via a laptop screen. The stimuli were colourful drawn images of long thin objects (e.g., giraffes, snakes, ladders, carrots) created by one of the authors. These objects were chosen as their length could be manipulated without unnaturally distorting the image. Each trial used a different image. On the screen, the images appeared to be approximately 5.5, 4.95 and 4.4 cm tall. A comparison image was presented on the left of the screen. Three similar stimuli, one of which was identical in height to the comparison image, were presented on the right of the screen (see fig. 1). The dimensions of the areas containing the comparison image and the other stimuli were 8.8 cm by 10.6 cm; they were positioned 2.6cm apart, 4.5cm from the top and bottom of the screen, and 1 cm from the left and right of the screen. These areas

subtended a vertical visual angle of approximately 15 degrees. The three line-pictures in the right-hand area were positioned vertically; distributed evenly; and labelled ‘1’, ‘2’, and ‘3’. There were four practice slides and 18 test slides, each of which used a different image.

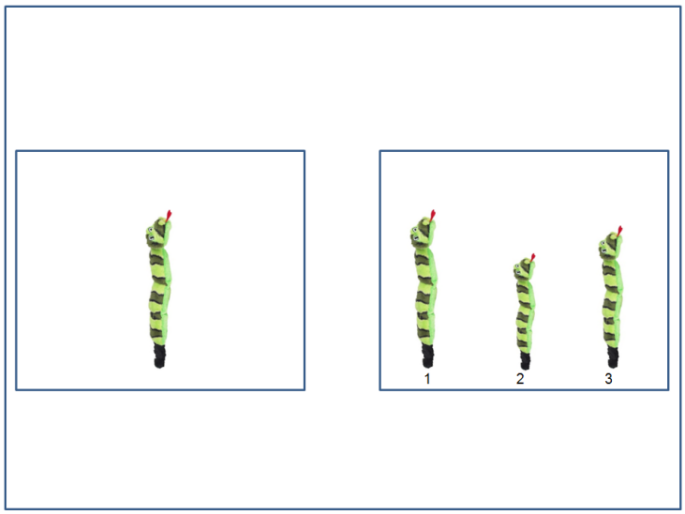

Figure 1. An example of the child-friendly images used in this study.

Autism Quotient. The Autism Quotient (AQ; Baron-Cohen et al., 2001) comprises 50 questions divided evenly between five scales: *social skills* ("I prefer to do things with others rather than on my own"), *attention switching* ("I prefer to do things the same way over and over again"), *attention to detail* ("I often notice small sounds when others do not"), *communication* ("Other people frequently tell me that what I’ve said is impolite, even though I think it is polite."), and *imagination* ("If I try to imagine something, I find it very easy to create a picture in my mind"). Responses are on a four-point scale. "Definitely agree" or "Slightly agree" responses score 1 point for positively worded items. The opposite is the case for negatively worded items. The adolescent version of the AQ, designed for use with children under the age of 16, was used (Baron-Cohen et al., 2006). This version is completed by parents on behalf of their children. Accordingly, the questions change from referring to "I" to "my child". The authors of the AQ propose that a

score of 32+ might indicate indicates a possible diagnosis of Asperger Syndrome or high-functioning autism, though Woodbury-Smith, Robinson, and Baron-Cohen (2005) suggest that a threshold of 26+ may be preferable. Both versions of the AQ have been shown to have good validity and reliability (Baron-Cohen et al., 2001, 2006).

Procedure

Prior to the testing phase, study-information packs containing a copy of the AQ were sent home with children to be filled out by parents. Subsequently, children in both the autism and the typically-developing group were tested in a familiar classroom environment. Situational familiarity is particularly important when collecting data with people on the autism spectrum (Chen et al., 2009). Only the participant and the researcher were present. Participants sat at a table on which a laptop was set up. Before the task proper, there were four practice trials without any social pressure. Children were asked "Which (*name of object*) is the same size as this one (*pointing to it on the left hand side of the screen*)". In accordance with Greasley (2008: 6) instructions were "clear, brief and unambiguous" to ensure children understood the task. The instructions were also checked with teachers beforehand, who confirmed that they should pose no challenge to the children's comprehension ability. If the children pointed at the correct response on the screen or said the correct number it was classed as the right answer. No feedback was given to the child, regardless of what response they gave. Participants were required to get at least three out of the four practice trials correct. One child with autism did not meet the necessary threshold during the practice trials. Accordingly, their data and the data of their matched typically-developing child were excluded from subsequent analysis.

During the actual task, children were told "Most people think that this (*pointing at the image in the first rectangle*) is the same size as number X (*pointing to an image in the*

second rectangle). Which do you think is the same size?" As in the practice trials, children could respond by pointing or by saying the number of the stimulus they thought matched the comparison image and they received no feedback. The researcher gave misleading information in twelve of the trials, and correct information in six of the trials (in pseudo-random order). The positions of the correct, misleading, and incorrect stimuli were counterbalanced across trials. After the session all the participants were asked "Do you know what I was looking for in this game?" to establish whether the children understood that there was an attempt to deceive them. There was a short debrief session afterwards where participants were told of the purpose of the study and reassured as to what the correct answers had actually been. Data collection lasted approximately 15 minutes.

Results

Participants were given misleading information about what most people thought in 12 of the 18 trials. Accordingly, they could receive a maximum conformity score of 12 (by incorrectly agreeing with what "most people" thought on the 12 trials). As expected, typically-developing children conformed far more often (M = 4.67, SD = 2.22) than children with autism (M = 0.80, SD = 1.47), $t(28) = 5.61$, $p < .001$, $d = 2.12$. There was a very small number of trials in which neither the correct line nor the line that most people chose was selected. Neither group committed more errors of this sort than the other, suggesting that they equally understood the task and instructions. There was also no difference between the two groups on the six trials where participants were told that the answer that "most people" gave was congruent with the correct answer (the mean for both groups was exactly 5.67). This difference in conformity persisted even after filtering out those participants who reported having been aware of deception (seven typically-developing children and four children with autism). Similarly, the analysis was repeated

excluding the two typically-developing children whose AQ scores exceeded the threshold that indicates possible autism, and the one child with autism whose AQ score fell below the threshold. Again, the same pattern of results was revealed.

In keeping with Bowler and Worley (1994), we also examined run length (where a run is a consecutive sequence of two or more conforming or non-conforming responses). Given the almost uniform non-conformity of the autism group, it is perhaps unsurprising that the mean run length for this group (M = 10.27, SD = 2.97) was significantly longer than for the typically-developing group (M = 4.49, SD = 2.77), $t(28) = 5.51$, $p < .001$, d = 2.01.

Correlational analysis (Pearson's r) indicated that AQ score was negatively associated with propensity to conform, $r(28) = -.82$, $p < .001$. This relationship was also observed when looking at just the typically-developing group, $r(13) = -.66$, $p = .007$. However, the relationship between the two variables within the autism group was found to be non-significant, $r(13) = -.23$, $p = .418$. The AQ has subscales (*attention to detail*, *attention switching*, *social skills*, *communication*, and *imagination*), which permits further analysis at the level of specific domains of autistic traits. Despite the smaller than recommended sample size, regression analysis seemed to be the most straightforward way to disentangle the relative contribution of the five AQ subscales. Although all five significantly negatively correlated with conformity, regression analysis including them as predictors of conformity, $F(5,24) = 11.43$, $p < .001$, showed that *attention to detail* was the only individually significant predictor, $t(24) = 2.13$, $p = .043$.

At an individual level, the child with autism who conformed the most (on 5 out of 12 trials) had a relatively low AQ score (33; low for people diagnosed with autism). Conversely, the child from the typically-developing group who conformed the least (on 1 out of 12 trials) had a particularly high AQ score (36; above the threshold suggested by

Baron-Cohen et al., 2001). This pattern in individual scores reflects those of the overall sample.

Discussion

The aim of this study was to determine whether children with autism conform less than typically-developing children. To ascertain this, we used an implementation of the classic Asch study (Asch, 1956) that used child-friendly stimuli and avoided the use of a group of confederates. Instead, the researcher indicated what "most people" thought the correct answer was (sometimes misleadingly). Using this protocol, the hypothesised difference between the two groups was observed. Further, the negative association between autistic traits (as measured by the AQ) and propensity to conform was maintained even within a group of typically-developing children. These results provide further evidence of conformity in children (e.g., Hayanama and Mori, 2011; Haun and Tomasello, 2011), but, more importantly, they also suggest that social conformity processes are attenuated in people with autism. Bar a single study looking at adults with Asperger Syndrome (Bowler and Worley, 1994), little previous research has examined the relationship between conformity and autism.

The finding of differences in conformity between children with and without autism accords with that of Bowler and Worley (1994). However, the observed association between a continuous measure of autistic traits and conformity is particularly interesting. This finding extends the relevance of these traits into the general population. Indeed, in a striking example of this, one of the children who had not been diagnosed on the autism spectrum but who had a particularly high AQ score conformed only once: lower than any other child in the typically-developing group. The existence of subscales on the AQ also allowed the identification of the particular domains of autistic traits that are pertinent to

this lack of conformity. Despite the relatively small sample size, regression analysis revealed that the only real predictor was *attention to detail*. It makes sense that this trait, which reflects a potentially obsessive focus on the precise nature of things, would support responses to the stimuli themselves, effectively suppressing the influence of social pressure. Of course, attention to detail cannot be the sole determinant of whether people conform or not as it is easy to imagine a person high in this trait who would still tend to conform. Although the association between total AQ score and conformity seems to have disappeared in the autism-diagnosed group, it is likely that this is a statistical artefact due to a lack of variance in conformity scores within this group. There was a substantial "floor" effect whereby the majority of participants in this group did not conform at all. This lack of variance is also evident in the run length analysis, where the mean run length of children with autism was substantially longer. The difference between the two groups is extremely similar to that observed by Bowler and Worley. They suggest that this pattern might reflect the tendency of people with autism to display perseverative behaviour (here answering correctly).

The use of self-report (here parent-report) measures such as the AQ comes with various caveats, one of which is that participants' scores may not be true reflections of their degree of autistic traits. Nonetheless, scores did correlate extremely well with diagnosis (or lack thereof) and were associated with conformity in the predicted direction. It was also noted that three participants fell on the other side of the AQ-score threshold (32+) than would be suggested by their group membership. However, Woodbury-Smith et al. (2005) suggest that a threshold of 26+ may actually be preferable. Using this threshold, the lowest-scoring person from the autism group falls within the expected range. Irrespective of which threshold is used, the same number of children from the typically-developing

group (i.e., two) falls above the suggested cut-off. Regardless, analysis was repeated removing these threshold-transgressing participants with no substantial effect on results.

A conception of autistic traits as existing on a continuum allows the possibility that people within a typically-developing group may have particularly high, albeit sub-threshold, levels, while a diagnosed group may have particularly low scores. If this were the case, the two groups would be much more similar than might be expected, essentially eliding differences between what might otherwise be construed as categorically distinct groups. The use of the AQ allows us to definitively reject the possibility that the groups within the current study are similar in this way. Of course, the size of the observed difference between the two groups also argues against this.

The use of a single adult reporting what "most people" think, rather than a panel of peers could be a cause for concern. It is difficult to know how valid a source of social pressure this imagined majority could be (although Cinirella and Green [2007] have shown that majorities who are not physically present can also lead to conformity). Further, it could be argued that rather than conforming to an imagined majority, the children were simply going along with what they thought the adult wanted them to do (Ma and Ganea 2009; Haun and Tomasello 2011). However, whether it was the imagined majority or the adult that was the source of social pressure is in one sense irrelevant as, in either case, there was strong evidence of conformity in the typically-developing group and a corresponding lack in the autism group.

Future research may seek to link this finding to the rich literature that already exists within the study of conformity. For example, majority size has been shown to be important in the general population (Bond and Smith, 1996), but may not be relevant to people with autism. Gender could similarly be investigated. The use of a physically present panel of co-raters, whether confederates purposefully misleading the participant or participants who

see a different image (e.g., Hayanami and Mori, 2011), could also be valuable. Such a procedure could clarify whether the use of an adult reporting what "most people" thought confounded the present study's findings. Manipulation of the degree of "socialness" in any protocol (e.g., number of co-raters and physical presence/absence) could be particularly valuable in the context of autistic traits.

This study has shown that children with a diagnosis of autism are less likely to conform than others, possibly due to resistance to social pressure, and that autistic traits are similarly negatively associated with conformity in a typically-developing sample. Specifically, it was found that attention to detail is particularly important for supporting responses to stimuli in the face of social pressure. However, this study used a relatively uncomplicated protocol and there is much scope for further investigation of how autism is related to social conformity of the lack thereof. This research may be particularly relevant to classroom environments, where social influence can be an important for learning.

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