



Conversational topic moderates social attention in autism spectrum disorder: Talking about emotions is like driving in a snowstorm



Tiffany L. Hutchins*, Ashley Brien

University of Vermont, United States

ARTICLE INFO

Article history:

Received 14 September 2015

Received in revised form 3 March 2016

Accepted 4 March 2016

Available online 25 March 2016

Keywords:

Autism

Social cognition

Face processing

Conversation

Executive function

Visual attention

ABSTRACT

We compared the visual attention of typically developing (TD) children and age-matched children with ASD in two conversational contexts. Compared to the TD group, the ASD group had significantly fewer fixations to eyes and increased fixation time to mouths during a conversation about 'how people feel' but not about 'what people do'. This shift away from eyes and towards the mouth in ASD was associated with higher autism severity, more limited executive function (EF), and poorer verbal and intellectual ability. One particularly striking result was that eye-fixation and mouth-time data correlated with different EF subdomains. We argue that talk about emotions strains EF which may contribute to atypical visual attention to faces and that eye-fixation and mouth-time data may be under the control of different facets of EF.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Studies examining how individuals with ASD respond to faces commonly report that, compared to TD controls, persons with ASD demonstrate reduced attention to the eye region (Boraston, Corden, Miles, Skuse, & Blakemore, 2008; Corden, Chilvers, & Skuse, 2008; Dawson, Webb, & McPartland, 2005) and increased attention to the mouth region of the face (Klin, Jones, Schultz, Volkmar, & Cohen, 2002; Norbury et al., 2009; Spezio, Adolphs, Hurley, & Piven, 2007a; Spezio, Adolphs, Hurley, & Piven, 2007b). Decreased attention to eyes has been linked to amygdala dysfunction (Dawson et al., 2005) and is consistent with research suggesting that people with autism tend to find direct eye contact aversive (Spezio et al., 2007a,b). Decreased attention to eyes may, in turn, contribute to a compensatory privileging of mouth-information during face processing in ASD (Gross, 2004; Joseph & Tanaka, 2003). Of course, a tendency toward mouth-looking could also reflect deficient top-down processing (insofar as eye information lacks meaning for persons with ASD; Klin et al., 2002) or bottom-up attentional capture by perceptually salient mouths that move, make noise, and produce audio-visual synchrony (Flack-Ytter, Bakker, & von Hofsten, 2011; Spezio Huang, Castelli, & Adolphs, 2007).

Interestingly, some researchers have documented that more mouth-looking is associated with better communicative (Chawarska, Macari, & Shic, 2012) and social competence (Klin et al., 2002; Jones, Carr, & Klin, 2008) in ASD. This finding seems counterintuitive and difficult to square with the notion that social competence is, to some degree, contingent on the ability to use information from the eye region of the face. Indeed, eye-information seems essential for emotion recognition,

* Corresponding author at: University of Vermont, Department of Communication Sciences & Disorders, 407 Pomeroy Hall, 489 Main Street, Burlington, VT 05405, United States.

E-mail address: thutchin@uvm.edu (T.L. Hutchins).

following eye-gaze, establishing joint attention, and reading intentions, all of which are hallmark impairments of ASD. Nonetheless, a hyper focus on mouth stimuli might be advantageous in that it may aid in speech perception and the disambiguation of speech sounds (Buchan, Pare, & Munhall, 2008; Joseph & Tanaka, 2003). Of course, the finding that increased mouth-looking is associated with better outcomes is complex and some evidence suggests that the relation is contingent on social context (Elsabbagh et al., 2014) as well as participant age, symptom severity, and cognitive profile (Rice, Moriuchi, Jones, & Klin, 2012).

It is crucial to note that when it comes to the question of whether individuals with ASD exhibit excess mouth-looking and diminished eye-looking relative to TD individuals, the evidence is mixed (for review see Guillon, Hadjikhani, Badual, & Roge, 2014). Indeed, several studies have failed to document differences in eye- versus mouth-looking (Anderson, Colombo, & Shaddy, 2006; Bar-Haim, Shulman, Lamy, & Reuveni, 2006) and many have concluded that there is a great deal of similarity in how TD and ASD groups allocate visual attention such as the proportionally greater attention to the eye region as compared with the mouth (Falkmer, Larsson, Bjällmark, & Falkmer, 2010; Snow et al., 2011). These discrepancies may be due to participant characteristics (e.g., age, IQ, autism severity) and methods variance (for a review see Harms, Martin, & Wallace, 2010). Of particular interest to the present study is the role of social context as a determiner of looking-behavior.

1.1. Social context

Social context represents an important task demand that is likely consequential for visual attention to social stimuli. For example, Chawarska et al. (2012) examined how toddlers sustain attention to a video of an actress who appeared in different social conditions. When child-directed speech and eye contact were used, toddlers with ASD showed decreased attention to the scene and spent less time looking at the speaker's face and monitoring the mouth compared to controls. Although many studies have examined how children with ASD monitor scenes of videotaped actors (Jones et al., 2008; Klin et al., 2002; Shic, Bradshaw, Klin, Scassellati, & Chawarska, 2011; von Hofsten, Uhlig, Adell, & Kochukhova, 2009), how they attend to social stimuli during dynamic conversational exchanges is rarely considered. Yet, social interaction and social observation likely require distinct modes of social cognition (Tylen, Allen, Hunter, & Roepstorff, 2012; Roseberry, Hirsh-Pasek, & Golinkoff, 2014) and so it is surprising how few studies have examined visual attention in ASD in the context of actual social interaction. In fact, we are aware of only two eye tracking studies in the psychology literature that have examined social attention during dynamic exchanges (Freeth, Foulsham, & Kingstone, 2013; Spezio, Huang et al., 2007) and while both cited implications of their data for ASD, neither used participants with ASD.

While success during dynamic conversational exchanges has a broad social-cognitive foundation and is known to be difficult in ASD, all conversations are not uniformly challenging and this has implications for visual attention (Nadig, Lee, Singh, Bosshart, & Ozonoff, 2010). In this study, we examined how children attended to a speaking partner's face while engaged in conversation about two different topics. One topic involved discussions about "things that people do". The comparison topic involved discussions about "things that people feel" and it was chosen on the basis of decades of research showing deficits in emotion-reasoning in ASD and, therefore, its potential to be particularly difficult for children with ASD.

1.2. Executive function

Clearly, social interaction has implications for executive function (EF) which refers to a broad range of component processes necessary for the control and execution of complex behaviors (e.g., planning, working memory, inhibition, attention shifting). Compelling evidence has been cited in support of the interrelatedness of social interaction and EF (for a recent review see Moriguchi, 2014). Much debate still surrounds the nature of the social interaction – EF relationship including the direction of effects and the structure of EF from a developmental standpoint. Nonetheless, researchers generally agree that EF is at least implicated in important ways in the ability to process complex stimuli (like the face), respond to and maintain reciprocal exchanges (as in everyday conversation), and differentiate and classify emotions (Oerlemans et al., 2013): abilities we intended to recruit in the tasks in this study. At the same time, some discussion remains as to which EF subdomains are impaired in ASD (Oerlemans et al., 2013). Moreover, since studies of EF, ASD, and face processing typically report EF merely as a composite variable or use different tasks to examine a very limited set of EF components, it is impossible to discern the contribution of various facets of EF to inconsistencies in social attention. In this study, we assessed a range of EF subdomains using a single measure to allow these comparisons while controlling for methods variance. Of course, one potential correlate of EF and an important predictor of fixation patterns and social adaptation in ASD in its own right is intellectual functioning (Howlin, Good, Hutton, & Rutter, 2004; Rice et al., 2012). For this reason, we also examined IQ as a predictor of looking behavior.

2. Materials and methods

2.1. Ethics

All procedures employed in this study were conducted in accordance with and under the supervision of the Institutional Review Board of the University of Vermont.

Download English Version:

<https://daneshyari.com/en/article/369959>

Download Persian Version:

<https://daneshyari.com/article/369959>

[Daneshyari.com](https://daneshyari.com)