



Gaze aversion during social style interactions in autism spectrum disorder and Williams syndrome

Gwyneth Doherty-Sneddon^a, Lisa Whittle^b, Deborah M. Riby^{c,*}

^aSchool of Life Sciences, Northumbria University, Newcastle upon Tyne, UK

^bSchool of Natural Sciences, Stirling University, Stirling, UK

^cSchool of Psychology, Newcastle University, Newcastle upon Tyne, UK

ARTICLE INFO

Article history:

Received 17 July 2012

Received in revised form 28 September 2012

Accepted 28 September 2012

Available online 1 November 2012

Keywords:

Eye contact

Gaze

Williams syndrome

Gaze aversion

Autism spectrum disorder

ABSTRACT

During face-to-face interactions typically developing individuals use gaze aversion (GA), away from their questioner, when thinking. GA is also used when individuals with autism (ASD) and Williams syndrome (WS) are thinking during question-answer interactions. We investigated GA strategies during face-to-face social style interactions with familiar and unfamiliar interlocutors. Participants with WS and ASD used overall typical amounts/patterns of GA with all participants looking away most while thinking and remembering (in contrast to listening and speaking). However there were a couple of specific disorder related differences: participants with WS looked away less when thinking and interacting with unfamiliar interlocutors; in typical development and WS familiarity was associated with reduced gaze aversion, however no such difference was evident in ASD. Results inform typical/atypical social and cognitive phenotypes. We conclude that gaze aversion serves some common functions in typical and atypical development in terms of managing the cognitive and social load of interactions. There are some specific idiosyncrasies associated with managing familiarity in ASD and WS with elevated sociability with unfamiliar others in WS and a lack of differentiation to interlocutor familiarity in ASD. Regardless of the familiarity of the interlocutor, GA is associated with thinking for typically developing as well as atypically developing groups. Social skills training must take this into account.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

Eye gaze serves many functions; ranging from social and emotional to intellectual. Furthermore, gaze behaviour plays an important role in many aspects of child development. Measures of gaze provide insights into typical and atypical social, emotional and cognitive development. For example, there are developmental changes in how infants respond to observed head and eye gaze shifts over the first 36 months of life (Moore & Corkum, 1998; Doherty, Anderson, & Howieson, 2009) linked to the maturation of socio-cognitive systems.

1.1. Gaze aversion and cognition

Typically, we spontaneously and consistently look away from the face of an interlocutor during cognitively demanding activity by engaging in the overt behavioural response of 'gaze aversion' (GA; Doherty-Sneddon, Bruce, Bonner, Longbotham,

Abbreviation: GA, gaze aversion.

* Corresponding author at: School of Psychology, Newcastle University, Ridley Building 1, Framlington Place, Newcastle upon Tyne NE1 7RU, UK.
Tel.: +44 0 191 222 6557; fax: +44 0 191 222 5622.

E-mail address: deborah.riby@ncl.ac.uk (D.M. Riby).

& Doyle, 2002; Glenberg, Schroeder, & Robertson, 1998). While GA occurs very little when people are listening to another person speak (Doherty-Sneddon et al., 2002; Glenberg et al., 1998), it predominantly occurs while thinking and (albeit to a lesser extent) while speaking. So, the occurrence of GA potentially reflects the need to concentrate on drawing information from memory and/or engage in on-line cognitive processing, such as speech-planning or computation (Doherty-Sneddon et al., 2002; Glenberg et al., 1998). Conversely, given that under normal circumstances speech perception may be facilitated by the processing of visual information from a speaker's face (McGurk & MacDonald, 1976), having access to relevant visual cues is most beneficial while listening to a speaker. In other words, we attend to visual cues when they are most useful to us, but when we need to concentrate on internal cognitive processing we 'ignore' them by averting our gaze away from the person with whom we are interacting – the 'cognitive load hypothesis' of gaze aversion. Consistent with this interpretation is the finding that GA also occurs in response to objects other than faces, including video-cameras (e.g. Ehrlichman, Weiner, & Baker, 1974).

1.2. Gaze aversion in typical development

Empirical work suggests that children use GA whilst thinking (and, to a lesser extent, speaking) from around 5 years of age (e.g. Doherty-Sneddon et al., 2002; Phelps, Doherty-Sneddon, & Warnock, 2006). Indeed, it has been argued that a significant developmental surge in the use of GA behaviours during thought occurs between 5 and 6 years of age (Phelps et al., 2006); a behaviour which continues to develop (less markedly) throughout the next 2 years. So, by the time children have reached 8 years of age they use GA like adults to help them manage cognitive load (Doherty-Sneddon & Phelps, 2005; Doherty-Sneddon et al., 2002). In contrast, 5-year-old children have been shown to use GA to a much lesser extent (about half the proportion of thinking time as older children and adults), and also fail to consistently increase their looking away in response to increasingly difficult questions although some evidence for this does occur (Doherty-Sneddon et al., 2002; Phelps et al., 2006).

1.3. Neuro-developmental disorders and eye gaze

Williams syndrome (WS) and autism spectrum disorders (ASD) are neuro-developmental disorders associated with atypical patterns of gaze behaviour, atypicalities of social functioning and intellectual impairment. In the current studies we provide novel analyses of GA during social interactions by participants in these groups, contrasting GA while listening, thinking and speaking with familiar and unfamiliar interlocutors. These measures provide innovative new ways of addressing the cognitive and social phenotypes of the groups, revealing possible syndrome-specific effects of atypical development on social interaction styles and informing typical developmental theory (for the importance of these disorders for informing typical developmental theory see Asada & Itakura, 2012). In addition these two disorders afford new insights into the implications of gaze behaviour for information processing during face-to-face interaction.

1.3.1. Williams syndrome

Williams syndrome (WS) is a relatively rare neuro-developmental disorder (estimated prevalence 1:20,000, Morris & Mervis, 2000; but see Stromme, Bjornstad, & Ramstad, 2002) caused by the microdeletion of approximately 25–28 genes on chromosome 7 (7q11.23; Donnai & Karmiloff-Smith, 2000). This developmental disorder is associated with mild to moderate intellectual impairment (Searcy, Lincoln, & Rose, 2004) that occurs alongside unique cognitive and socio-behavioural phenotypes. The social characteristics are very different from those associated with the autism spectrum (Brock, Einav, & Riby, 2007; for discussion of the benefit of direct comparison between these disorders see Asada & Itakura, 2012). Individuals with WS often show outgoing social behaviours that have been referred to as 'hypersocial' (e.g. Jones et al., 2000; Frigerio et al., 2006), they may treat everyone as their friend irrespective of familiarity (Gosch & Pankau, 1997), and during social engagement they may use intense eye contact (Mervis et al., 2003) and atypical social interaction styles (e.g. Asada, Tomiwa, Okada, & Itakura, 2010). Williams syndrome has been described as being at the 'opposite end of the spectrum' to autism and hence why they are an interesting comparison group in studies of socio-cognitive profiles.

Modulating attention, a skill highly related to eye gaze behaviour, may be problematic for individuals with WS (Cornish, Scerif, & Karmiloff-Smith, 2007) and may be entwined with problems shifting gaze towards and away from faces (Riby et al., 2011). Research has suggested that frontal lobe dysfunction and executive functioning deficits may contribute to aspects of the WS behavioural and social phenotypes (Rhodes, Riby, Park, Fraser, & Campbell, 2010) and contribute to atypical gaze behaviours (Porter, Coltheart, & Langdon, 2007). It is further proposed that individuals with WS have problems that are specific to attention disengagement (rather than engagement) and that these problems are especially clear when disengaging from faces (Riby et al., 2011; Riby & Hancock, 2009). Therefore, attentional deficits have been provided as possible contributors to atypical social behaviours (such as increased attention to faces) in WS, with the alternative being the role of abnormal amygdala structure and function (e.g. Haas et al., 2009). How and when individuals with WS look away during an interaction is therefore of considerable interest.

1.3.2. Autism spectrum disorders

Autism spectrum disorders (ASDs) cover a range of pervasive developmental impairments that have a particular effect upon the way an individual functions and interacts socially. Autism is characterized by severe impairments of social

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات