Social Cues In Autism

Autism Spectrum Disorder (ASD) is a term used to describe a group of deficits such as a lack of social communication and repetitive sensory-motor behaviours, it is associated with a strong genetic component as well as other causes, these deficits are said to appear early on in an individual's life and ASD shows itself in many different ways (Lord et al., 2018). ASD follows a diagnostic criteria in which an individual with ASD shows persistent deficits in social communication and interaction across a number of contexts, as displayed by deficits in social-emotional reciprocity, non-verbal communicative behaviours and developing, maintaining and understanding relationships (American Psychiatric Association, 2013). Additionally, individuals with ASD are said to show restricted, repetitive patterns of behaviour, interests or activities shown through repetitive motor movements, inflexible adherence to routines, fixated interests and hyper or hyporeactivity to sensory stimulation from the environment (American Psychiatric Association, 2013).

The ability to read and recognise emotions in other people is essential for healthy development, it can guide responses and decision making to social cues and enhances capacity to develop social bonds (Parr et al., 2005). The idea that reading social cues is the key deficit in autism is based on the suggestion that children with autism appear to have an inability to experience empathy, which is said to be both an old and widely held idea (Kanner, 1943; Gillberg, 1992). However, opposing views suggest that different types of interventions such as social stories, that include four to six sentences that describe factual information regarding a social situation, possible reactions of others in that social situation, and directive statements of appropriate or desired social responses (Thiemann & Goldstein, 2001), show that it is not a fixed deficit. This essay will explore the idea that reading social cues is the key deficit in autism, presenting supporting arguments as to why autistic individuals cannot read social cues, and opposing arguments as to why other deficits may be more prominent, and that intervention strategies can be used to improve social cue deficits.

Firstly, reading social cues may be the key deficit in autism, as individuals with autism may not recognise or read social cues and respond in the same was as a neurotypical person, this is suggested to be because autistic individuals struggle to interpret non-verbal communication (Rigby et al., 2018). This deficit links to empathy in that research suggests that autistic individuals do not engage in spontaneous imitation of others, and as they learn social skills through mimicking and repetition, they may show a deficit in displaying expressions of empathy also (Mul et al., 2018). This is supported by Dautenhahn (1999) who suggested that higher-functioning individuals with autism learn and memories rules about types of behaviour that is socially acceptable during interactions with neurotypical people, instead of being able to pick up and understand these social cues naturally. Basic empathy processes are suggested to require emotion to be quickly extracted from briefly presented stimuli (Clark et al., 2008). For example, detection of subtle social cues (Ekman, 1984). Greene et al., (2011) similarly suggests that one aspect of the social impairments in autism is a reduced response to social cues such as reading eye gaze or pointing gestures. This links again to empathy in that Blair (2008) suggests that one of the key processes behind functional empathy is recognising others' emotional distress cues such as fear and sadness.

Empathy has long been considered difficult for autistic individuals, yet empathy is considered a complex concept that consists of many factors (Baron-Cohen and Wheelwright, 2004). Kohls et al., (2011) suggests that children with autism do not seek out and recognise the pleasure associated with social stimuli that normally drives typically developing children to seek out such stimuli. For autistic individuals who cannot extract emotional information from social cues, empathic process may be based more on broader situational cues, scripts, or the autistic individuals own emotional state rather than the dynamic changes in the emotional state of who they are interacting with (Clark et al., 2008). However, there may be issues with the complexity of social cues and how they link to empathy, as Zaki and Ochsner (2012) suggests that complex, compared to simple, social cues engage different patterns of neural activity, which means that empathy may not be fully understood when deconstructing it into components. Further, it has been suggested that the causality may actually be the other way round, in that autistic individuals have difficulties with the ability to process a number of social cues and so this may interfere with their ability to express empathy (Kern Koegel et al., 2015). Additionally, Wing et al. (2011) suggests that even if a person with autism lacks empathy, they may still have sympathy in situations where they can perceive another person's distress, and when they do understand, they respond. Therefore, although some individuals with autism display an inability to show empathy, and this could be argued to be the reason for the key deficit in reading social cues, it could be argued that actually, reading social cues is not the key deficit in autism as studies may have only explored social cues that are too complex for autistic individuals to understand.

In opposition, a Theory of Mind (ToM) deficit suggested a possible explanation for the major symptoms of autism (Tager-Flusberg, 2007) suggesting that this deficit may be in fact more prominent and important than a deficit in reading social cues. When interacting in everyday life, the ability to evaluate other individual's behaviour on the basis on their mental state, such as their goals, emotions and beliefs is important, this is suggested to be done by certain cognitive systems, collectively referred to as ToM (Tager-Flusberg, 2007). Although some children show a core deficit in social reciprocity and communication skills, it is suggested that the variation of this deficit may be partially explained by the deficits in ToM (Tager-Flusberg, 2007). Early signs of autism include a failure to read social cues, but it is suggested that this can be interpreted within a ToM framework (Tager-Flusberg, 2001), suggesting that ToM deficit can be thought of as the key deficit in autism, rather than reading social cues. However, the ToM deficit is not an explicit component of the DSM diagnostic criteria (Adams, 2011), proposing that perhaps other deficits, such as reading social cues are more prominent.

The deficit of ToM in autism was historically studied using the Sally-Ann task, Baron-Cohen, Leslie and Frith (1985) found that only 20& of autistic children could complete the task with a mental age of over 4 years old, compared to a group of neurotypical 4-year-old children. The ToM deficit may give a collective explanation for the core symptoms or deficits of autism, however Frith (1994) identifies the issue that not all autistic children fail ToM tasks, possibly suggesting that the ToM deficit may not be the key deficit in autism. Conversely, it is suggested that when autistic individuals get to a certain age of adolescence, particularly high-functioning autistic individuals, often pass ToM tasks at different levels of difficulty, but their performance does not replicate in everyday settings (Begeer et al., 2010). This may be due to the nature of the ToM tasks presented to autistic individuals. If they are explicit and static, it is suggested that the skills may not reflect in dynamic, ecological, real-life situations (Kimhi, 2014), therefore suggesting that on the surface it may be that some autistic individuals do show a ToM, but the deficit is still prominent when applying to everyday life. However, research that focuses on high-

functioning autistic individuals suggest that they can pass ToM tasks consistently and can apply these skills across many different areas (Happé, 1993). Happé (1993)'s research is promising in terms of suggesting that autistic individuals may not show a ToM deficit, however this may only be true for high-functioning autistic individuals, and therefore a ToM deficit is still the key deficit in autism.

On the other hand, reading social cues is argued to be the key deficit in autism as individuals with autism show atypical brain activation in response to facial expressions and gaze, with such failure being proposed to be a crucial factor underlying the social deficiencies in autism (Frith and Frith, 1999). A failure of automatic social cue processing that occurs in neurotypical individuals is suggested to compromise an individual's opportunities for successful social interactions (Jellema et al., 2009). Argyle and Cook (1976) suggest that gaze direction is a powerful social cue, with mutual gaze often signalling a threat or approach and averted gaze showing submission or avoidance. Hoffman and Haxby (200)'s research compared neural activity for viewing averted gaze directed gaze, they found stronger activity in the intraparietal sulcus (IPS), a region of the posterior parietal cortex (PPC) that is part of a fronto-parietal network which is suggested to be consistently involved in orienting attention. Neurotypical adults display different activation in the PPC when examining gaze shifts that met and those that did not meet expectations (Pelphrey et al., 2003), whereas autistic adults did not show this change in brain activation (Pelphrey et al., 2005). Therefore, activity in the PPC provides some evidence as to how individuals with autism process social cues (Greene et al., 2011).

Furthermore, in neurotypical individuals, gaze perception produces activation of the IPS, the superior temporal sulcus (STS) and regions of the dorsal and ventral fronto-parietal attention networks (Corbetta et al., 2008; Nummenmaa et al., 2009). In addition, the quality of the social cue being noticeable is captured by the amygdala which causes automatic attention to threatening stimuli (Öhman, 2005). This allows biologically appropriate stimuli to be processed even when it is outside the current focus of attention (Todorov, 2011). The interaction of emotion gaze direction is evidently involved in various attention processes (Nummenmaa et al., 2009), such processes could be suggested to be lacking in autistic individuals. However, some approaches are now suggesting that autism can be distinguished by a difficulty in integrating multiple social cues, which is suggested to be a deficiency related to disrupted long-distance connections between neural systems (Courchesne & Pierce, 2005). Further criticisms from Zürcher et al. (2013) state that despite their relevance in social communication, fear and gaze direction interactions have not been investigated using real faces in adults with autism. Zürcher et al. (2013)'s research using real faces when measuring attention to social cues found significant deficits in the activation of the network of social attention in high-functioning individuals with autism and networks involved in attention, gaze perception, acknowledgement of emotions and understanding of intentions were not engaged in individuals with autism when processing social cues of danger. Further opposing evidence from Pelphrey et al., (2005) found that individuals with autism showed normal activation of the STS when viewing gaze shifts. However, STS did not vary depending on intentions with autistic participants, whilst the opposite was true for neurotypical participants (Pelphrey et al., 2005). Therefore, reading social cues can be argued to be a key deficit in autism, such as facial cues of danger, due to atypical brain activation networks.

Lastly, reading social cues may not be the key deficit in autism, as a number of interventions have been produced that improve perception of social cues (Golan & Baron-Cohen, 2006). Ross and Young (2009) developed an intervention of giving oxytocin to autistic individuals, as

they suggest it may be a useful therapy for individuals with disorders that involve social deficits, specifically, a failure to read social cues. Support from Guastella et al., (2010) showed that the oxytocin improved autistic individuals performance on the 'Reading the Minds in the Eyes Task', which is a test of their ability to identify emotions in people's faces. However, Ross and Young (2009) suggested that although the use of oxytocin to improve social cue deficits in autistic individuals seems promising, it may only be beneficial when partnered with behavioural therapies.

(Golan & Baron-Cohen, 2006) have proposed an intervention called 'Mind Reading', which is an interactive guide to recognising social cues such as emotions and mental states. This intervention is suggested to be beneficial for autistic individuals as it is online instead of face to face, which means it is predictable, consistent and free from social demands (Golan & Baron-Cohen, 2006). This intervention found that following autistic individuals using the Mind Reading guide, their ability to read social cues such as emotion recognition skills improved significantly (Golan & Baron-Cohen, 2006). However, individuals with autism are suggested to have difficulties with generalisation (Rimland, 1965), this could be because of their preference for keeping things the same, and being inflexible (Golan & Baron-Cohen, 2006), and so generalising these results to everyday situations may be difficult.

Another intervention proposed by Lee et al., (2018) uses augmented reality and concept mapping to focus on the social cues to teach autistic children how to appropriately reciprocate when greeting other people. The intervention used a training system to teach the children to recognise different events that could occur within a social relations concept map, and the children practised social greeting behaviour and attempted to mimic or copy the emotions they saw (Lee et al., 2018). The results of this intervention suggest that it is useful for teaching autistic individuals how to identify and comprehend people's social relationships using social cues, and how to respond to people according to that relationship (Lee et al., 2018). Support from Marshall (2007) suggests that a kinesthetic learning experience may be beneficial for the development of social skills for people with autism, such as reading social cues. These interventions therefore suggest that although reading social cues may be more difficult for autistic individuals, it cannot be said that reading social cues is a key deficit, as it is not a fixed inability and can be improved.

In sum, this essay explored whether reading social cues is the key deficit in autism, or not. Supporting arguments suggest that autistic individuals may not be able to read social cues and respond in the same way as a neurotypical person, because autistic individuals struggle to interpret non-verbal communication (Rigby et al., 2018). This argument links to empathy skills in that is suggests that autistic individuals do not engage in spontaneous imitation of others, as they learn social skills through copying, they jay show a deficit in displaying expressions of empathy as well (Mul et al., 2018). The second supporting argument suggests that the interaction of emotion gaze direction is involved in various attention processes (Nummenmaa et al., 2009) and these processes could be lacking in autistic individuals. However, growing research showing a deficit in social reciprocity and communication skills, may actually be explained by the deficits of ToM (Tager-Flusberg, 2007) suggesting that reading social cues is not the key deficit of autism, ToM deficit is. Further, recent intervention strategies and programmes such as Ross & Young (2009)'s oxytocin intervention improved autistic individuals performance in the 'Reading the Mind in the Eyes Task' (Guastella et al., 2010). Similarly, the 'Mind Reading' interactive guide showed that autistic individuals ability to read social cues such as emotion recognition skills improved significantly (Golan & Baron-Cohen, 2006).

Therefore, in conclusion, it could be argued that reading social cues is not the key deficit in autism as it is not as prominent as other deficits, such as ToM, and is not fixed for the lifespan, as growing intervention strategies show evidence of improvement on reading social cues (Ross & Young, 2009; Golan & Baron-Cohen, 2006; Lee et al., 2018). Further, Fletcher-Watson and Bird (2019) make the important point that a growing body of research suggests that processes that have previously been identified as deficits in autism are actually better understood as interactive and communicative challenges that operate across the autistic and neurotypical individuals.