The Connections Between Self-Monitoring and Theory of Mind

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ABSTRACT

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Previous research on the personality characteristic of self-monitoring has shown that high self-monitors constantly adjust their behavior to fit their environment while low self-monitors follow internal cues to keep their attitudes and behaviors consistent with one another. Theory of Mind is a person's ability to connect unobservable mental and emotional states to one's self and others, while understanding that other people may have different thoughts, attitudes and beliefs than one's self that guides their behaviors. The current research examined a possible connection between self-monitoring and theory of mind. Participants completed a self-monitoring scale and two tasks evaluating their theory of mind. Participants who were high self-monitors had more correct answers on theory of mind tasks than participants who were low self-monitors. Low self-monitors showed more theory of mind deficits than high self-monitors, suggesting that high self-monitors have more intact theory of minds. The research therefore provides evidence of a previously unknown connection between self-monitoring and theory of mind, that may be an explanation for individual differences in self-monitoring.

One of the most researched concepts in psychology is the personality characteristic of self-monitoring. Self-monitoring was first introduced by Mark Snyder (1974, 1979) as a possible explanation for individual differences the controversy over the extent to which attitudes predicted behavior (Snyder & Monson, 1975). The attitude-behavior controversy reflected the discrepancy between early psychologists' theories that attitudes always predicted behaviors and results from their research showing various levels of consistency between a person's attitudes and the behaviors they engaged in (Azjen, Timko, & White, 1982; Liska, 1974). To explain the inconsistencies found in the research, psychologists started looking for additional variables that may moderate the relationship between a person's attitudes and their behaviors (Azjen et al., 1982). Snyder (1974, 1979) came up with the theory of self-monitoring as the personality characteristic explaining why some people's behaviors reflected their attitudes while others showed little consistency between the two (Snyder & Monson, 1975).

Snyder (1974) proposed that when a person monitors their behavior, they are observing the behavior and actions of other people surrounding them, as well as controlling how their individual behavior is outwardly expressed. This means that a person is constantly monitoring himself or herself and the environment around them at all times (Snyder 1974, 1979). Individual differences in self-monitoring reflect the extent to which a person's behavior may be determined by either situational or dispositional factors (Snyder & Monson, 1975). The theory of self-monitoring suggests that a person can be categorized as either a high self-monitor or a low self-monitor according to their scores on Snyder's (1974, 1979) Self-Monitoring scale (Snyder & Gangetad, 1986). High self-

monitors constantly monitor the environment around them and adjust their behavior and actions to make sure they are situationally appropriate. High self-monitors are sensitive to and often attend to the demands of the environment or situation surrounding them (Ajzen et al., 1983; Snyder, 1979). They are very concerned with the impression they give to others, which has been shown to be a factor in determining their behavior (DeBono & Omoto, 1993) . Snyder (1974, 1979) also proposes that some people are low self-monitors, who are people that do not constantly monitor their behavior against the situation, but rather have consistent attitudes and behaviors. Low self-monitors do not attempt to make their behavior consistent with the situation or people surrounding them, but rather their internal feelings. As opposed to high self-monitors who attend to the environment, low self-monitors follow more internal cues and feelings when performing behaviors (Ajzen et al., 1982; Snyder, 1979). Since low self-monitors use internal cues and not the surrounding situation to guide their behavior, their attitudes and behaviors stay more consistent with each other than high self-monitors, which provided a possible explanation to the attitude-behavior controversy. (Ajzen et al., 1982, Snyder & Monson, 1975).

Previous research on the relationship between self-monitoring and the attitude-behavior controversy compared the consistency of low self-monitors' attitudes and behaviors to those of a high self-monitor. Snyder and Tanke (1975) examined the attitude-behavior consistency of high and low self-monitors through a forced compliance experiment, in which the participants were asked to write essays about a controversial topic. Participants were classified as either low or high self-monitors. The participants

were divided into two groups, those who were instructed to take their own personal stance on the essay and those who were persuaded to write from the counter-attitudinal point of view (Snyder & Tanke, 1975). After completing the essays, the researchers re-surveyed the participants on their attitudes about the essay topic. Snyder and Tanke (1975) found that when the participants were re-surveyed, there was a strong correlation between the low self-monitors who wrote a counter-attitudinal essay and their final attitudes on the topic. For high self-monitors however, the stance they took on the essay and their final attitude about the topic were unrelated (Snyder & Tanke, 1975). Low self-monitors therefore, had a greater consistency between their attitudes and the behaviors than high self-monitors, which explained individual differences in the attitude-behavior controversy (Snyder & Tanke, 1975). In addition, Snyder and Tanke (1975) found that low self-monitors who were instructed to take a counter-attitudinal stance actually shifted their final attitudes to be aligned with the behavior of writing from that point of view. This study suggests that not only do low self-monitors experience a strong attitude-behavior consistency, but also that they may adjust their attitudes to keep them consistent with their behaviors.

Building off of the research by Snyder and Tanke (1975) showing consistency between low self-monitors' attitudes and behaviors, research by DeBono and Omoto (1993) investigated the attitude-behavior consistency when participants were provided with environmental cues. In particular, the study examined the differences between high and low self-monitors' attitudes in relation to their behavioral intentions when they exposed to social pressures to perform a certain behavior (DeBono & Omoto, 1993).

Participants completed the Self-Monitoring Scale (Snyder & Gangestad, 1986) and were asked about their willingness to write a letter that supported raising the legal drinking age, even if they did not neccesarily agree with that stance (DeBono & Omoto, 1993). Participants were also surveyed on how much their friends and family would want them to write the letter and how that influenced their decision. DeBono and Omoto (1993) found that low self-monitors' willingness to write the letter was significantly related to their attitude about the topic, but not to the influence of social pressures. The intentions of high self-monitors to write the letter however, were related to both their attitudes about the topic and the perceived social pressures, suggesting that their peers' opinions had an influence on their behaviors (DeBono & Omoto, 1993). This study provides additional evidence that low self-monitors' attitudes and behaviors stay consistent with each other, as well as showing that low self-monitors do not seem to be influenced by attitudes other than their own. Additionally, the relationship between high self-monitors' letter-writing intentions and the perceived social pressures suggests that environmental cues may play a large role in determining their behavior (DeBono & Omoto, 1993).

Further research on the individual differences in how self-monitors react to situational influences was performed by Klein, Snyder, and Livingston (2004). Specifically, the study examined at the social influence of a group of prejudice people on the attitudes of high and low self-monitors. As Snyder's (1974, 1979) theory of self-monitoring suggests, high self-monitors often adjust their attitudes to satisfy the expectations of the people around them at that particular moment (Klein et al., 2004). Through pre-testing, the researchers collected data on participants' self-monitoring scores

and the amount of prejudice each participant felt towards homosexual people (Klein et al., 2004). A few weeks after collecting the data, Klein et al. (2004) brought the participants back to the laboratory and told them that they would be discussing their personal views on homosexual people in a group setting. Half of the participants were told that they would be with a group of people who were accepting of homosexuality while the other half was told that they would be with a very prejudiced group (Klein et al., 2004). Participants were then resurveyed on their attitudes about homosexuality. Klein et al. (2004) found that high self-monitors who anticipated having to talk to a prejudiced audience reported more prejudiced attitudes than they previously had. In connection, high self-monitors reported less prejudicial beliefs when paired with a supposedly tolerant audience. Low self-monitors' attitudes towards homosexuality stayed consistent despite which group they were paired with, suggesting that their attitudes are not impacted by the same situational factors as high self-monitors (Klein et al., 2004). Low self-monitors are not affected by others' actions but rather their internal states in determining their behavior, while high self-monitors actively adjust their attitudes to stay consistent with the situation and people that are surrounding them (Klein et al., 2004).

Although the previous research (e.g. DeBono & Omoto, 1993; Klein et al., 2004) shows that high and low self-monitors react differently to societal influences, does this mean that other social differences exist between the two groups? Since high self-monitors adjust their attitudes to match those around them (DeBono & Omoto, 1993; Klein et al., 2004), might high self-monitors be more socially adept than low self-monitors? An early study by Furnham and Capon (1982) compared the social skills of high self-monitors to

those of low self-monitors. Their sample consisted of adults with typical social lives as well as a group of adults who were undergoing social skills training for various reasons (Furnham & Capon, 1982). In addition to Snyder's (1974, 1979) Self-Monitoring Scale, participants were measured on a variety of social abilities, including their assertiveness with others and the possible presence of social anxiety, as well as asked questions about various social situations (Furnham & Capon, 1982). Furnham and Capon (1982) found that in both the normal and clinical adult sample there was a significant relationship between self-monitoring and social skills, such that low self-monitors had more deficits in their social abilities than high self-monitors. Although this study looked very generally at people's social skills, it may be that high self-monitors have more social abilities because of their tendency to attend to environmental cues.

Additional research investigating the differences in social skills among high and low self-monitors has looked specifically at confirmation bias. Confirmation bias is a social skill in which a person tends to seek out and selectively attend to information that supports their already-formed beliefs about a subject (Dardenne & Leyens, 1995). Dardenne and Leyens (1995) studied confirmation bias by describing to high and low self-monitoring participants a particular person who was either an introvert or extrovert. Participants then met the person and formed their own hypothesis about their personality. Participants were then instructed to choose questions from a pre-determined list that would best test their hypothesis about the person's personality (Dardenne & Leyens, 1995). Since confirmation bias is considered a social skill, the researchers believed that the more socially skilled people would choose questions that would support their pre-

determined beliefs (Dardenne & Leyens, 1995). Dardenne and Leyens (1995) found that high self-monitoring individuals were more likely to choose questions that were relevant to the information they were already provided with, therefor supporting their predetermined beliefs. In contrast, low self-monitors chose questions that did not neccesarily support their hypothesis as true, despite the previous knowledge they were given (Dardenne & Leyens, 1995). Not only did this study provide additional evidence supporting Furnham and Capon's (1982) results showing that high self-monitors are more socially adept than low self-monitors, but it also implied that high self-monitors may be more socially-skilled because they attend to environmental cues. As seen in the research by Furnham and Capon (1982) and Dardenne and Leyens (1995), these environmental cues often are in the form of social cues from other people.

Although the previous research on self-monitoring and social skills was mostly laboratory-based (e.g. DeBono & Omoto, 1993; Dardenne & Leyens, 1995; Klein et al., 2004), the connections between self-monitoring and a person's social abilities have also been investigated in real-world settings. Mehra, Kilduff, and Brass (2001) looked at the differences in high and low self-monitors' social networks in a workplace setting. They hypothesized that high self-monitors' social abilities would positively contribute to their workplace performance by allowing them to form larger social networks than low self-monitors (Mehra et al., 2001). The researchers gathered data from a real technology firm with approximately 100 employees. Participants completed the Self-Monitoring Scale (Snyder & Gangestad, 1986) and various questionnaires regarding their social networks at work. Data on the employees' work performance was also gathered from their

employers (Mehra et al., 2001). Mehra et. al (2001) found that on average, high self-monitors had stronger work performances than low self-monitors. High self-monitors also tended to have more central positions in broader social networks than low self-monitors (Mehra et al., 2001). In other words, high self-monitors' success at work was related to their social relationships with many coworkers as well as being the center of their social circles, while low self-monitors tended to have significantly less social connections. Being in a central position of their social network demonstrates high self-monitors' abilities to form connections between people who would not have had a relationship otherwise (Mehra et al., 2001; Oh & Kilduff, 2001). This study provides additional evidence to the previous research suggesting that high self-monitors are more socially skilled than low self-monitors (e.g. DeBono & Omoto, 1993; Dardenne & Leyens, 1995; Klein et al., 2004) and shows how these differences are prevalent outside of the laboratory in real-world settings.

Further studies investigating the relationship between social skills and self-monitoring have found additional evidence suggesting that high self-monitors are more socially skilled than low-self monitors. Low self-monitors have been shown to have a harder time interpreting and understanding vocal cues than high self-monitors, which indicates that low self-monitors may experience some social deficits related to their conservation abilities (Mill, 1984). High self-monitors have been shown to be more likely to initiate and maintain conversations with other people (Ickes, Holloway, Stinson, & Hoodenpyle, 2006). Evidence suggests that high self-monitors are also more concerned about making sure those conversations with other people went well, indicating a

willingness to adjust their behavior to fit the situation (Ickes et al., 2006). As opposed to low self-monitors who attend to their internal states, high self-monitors are very socially skilled because of their desire to meet the demands of their environment (Dardenne & Leyens, 1995; Ickes et al., 2006).

Despite the various research examining the variety of differences between high and low self-monitors, there is still much that is not known the personality construct about self-monitoring. One major hole in the research about self-monitoring that needs to be addressed is why might these individual differences between high self-monitors and low self-monitors exist? Why are high self-monitors so socially adept compared to low self-monitors? Why do high self-monitor tend to fit their behavior to the environment while low self-monitors rely on internal factors to determine their behavior? One possible explanation for these individual differences is Theory of Mind. High self-monitors may possess a more developed theory of mind than low self-monitors. Low self-monitors may experience theory of mind deficits, forcing them to rely on internal states and feelings to guide their behaviors because they are unable to read the mental states of others.

Theory of Mind is a person's ability to connect unobservable mental and emotional states to one's self and others, while understanding that other people may have different thoughts, attitudes and beliefs than one's self that guides their behaviors (Premack & Woodruff, 1978). This ability helps a person infer, understand and predict other peoples' intentions and behaviors (Baron-Cohen & Wheelwright, 2001; Premack & Woodruff, 1978; Yeh, 2013). The concept of theory of mind was first introduced by Premack and Woodruff (1978) in their research on chimpanzees observing human actors.

The chimpanzees were shown video clips of humans in a cage struggling to get a banana that was out of their reach. The researchers then showed the chimpanzees pictures of possible solutions to the human's problem (Premack & Woodruff, 1978). The chimpanzees were able to choose the correct solution for the majority of the videos, leading Premack and Woodruff (1978) to suggest that chimpanzees had a theory of mind because of their ability to predict the behavior of human actors.

Although the beginning research on theory of mind used chimpanzees as subjects, theory of mind has been shown to be an innate but varying ability in humans that originates in their early childhood (Lillard & Kavanaugh, 2014). The beginnings of theory of mind occurs in children between four and five years old (e.g. Lillard & Kavanaugh, 2014; Morino, 2005; Wright & Mahfoud, 2012). The development of theory of mind represents a shift in the way children view other people; they start to understand that other peoples' behaviors are not random but rather motivated acts (Lillard & Kavanaugh, 2014). The development of theory of mind is also related to a person's ability to take on the perspective of other people, which in turn is what allows them to understand and predict others' behaviors (Lillard & Kavanaugh, 2014; Premack & Woodruff, 1978).

Previous research on the development of theory of mind in children has examined the strong connection between theory of mind and the ability to take on the perspective of another person. Harwood and Farrar (2006) conducted a study investigating how theory of mind was related to children's abilities to understand differences between their's and others' emotional states, also known as affective perspective taking (Harwood & Farrar,

2006). The researchers pooled a sample of three to five year-old children and gave them a variety of tasks meant to measure the development of their theory of mind. Children were asked to identify their best friend and talk about how they and their friend would feel in a variety of scenarios that analyzed the child's ability to infer their friends' emotional states (Harwood & Farrar, 2006). For example, children might have been asked how they would feel if they won something that their friend really wanted to win. A person who is able to successfully attribute emotions to oneself and others would understand that even though they are happy about winning, their friend may be sad about losing (Harwood & Farrar, 2006). Harwood and Farrar (2006) found that the development of the children's theory of mind was strongly related to a child's ability to correctly predict their friends' emotions in different social scenarios, suggesting that a person's theory of mind is connected to perspective-taking abilities. Additional research has shown that a well-developed theory of mind correlates with a child's accurate interpretation and understanding of emotions in other people, which provides additional evidence that theory of mind abilities are related to a child's ability to think about a situation from another person's point of view (Mier et al., 2010; Morino, 2005).

Since previous studies (e.g. Harwood & Farrar, 2006; Mier et al., 2010; Morino, 2005) show a connection between the development of a child's theory of mind and their understanding of other children's emotions, might similar connections between theory of mind and social abilities exist for adults? One study run by Yeh (2013) investigated the influence of theory of mind on the social abilities of older adults. Yeh (2013) believes that theory of mind may be the strongest predictor of a person's social intelligence. The study

pooled a sample of adults over the age of 50 who had never experienced psychological issues or mental illness, as that may affect their theory of mind abilities (Yeh, 2013). Participants were analyzed on a series of theory of mind tasks meant to measure their abilities to comprehend and infer the motivations behind other people's behaviors. They also completed a measure of social intelligence (Yeh, 2013). Yeh (2013) found that participants' performance on the theory of mind tasks was strongly correlated with their social intelligence, such that more socially intelligent participants performed better on the theory of mind tasks. Not only does this confirm the results found by Harwood and Farrar (2006) about the relationship between theory of mind and the ability to understand other people's behaviors, but it also provides evidence that a person's theory of mind is connected to their general social abilities (Yeh, 2013).

Although previous research (e.g., Lillard & Kavanaugh, 2014; Premack & Woodruff, 1978; Yeh, 2013) has shown theory of mind to be an innate trait among humans that is connected to a person's social abilities, additional studies have investigated how deficits in one's theory of mind may explain their lack of social skills, particularly among people with mental disorders. The majority of studies researching theory of mind deficits have used clinical patients as participants, as they tend to possess more deficits than a typical person (Yirmiya, Erel, Shaked, & Solomonica-Levi, 1998). One meta-analysis examined data from multiple studies comparing normal and clinical adult populations. Effect sizes from the meta-analysis determined that theory of mind deficits occurred significantly more in the autistic and Down syndrome samples than in the typical adult population (Yirmiya et al., 1998). The study also showed that autistic

individuals had much more severe theory of mind deficits than did Down syndrome individuals (Yirmiya et al., 1998). In recent research, theory of mind deficits are thought to be one of the current explanations for Autism Spectrum Disorders, since many of the social impairments shown by autistic people are related to the abilities gained through the development of theory of mind (Frith, Happe, & Siddons, 1994; Yirmiya et al., 1998). Theory of mind deficits refer to a person's difficulty with taking on the perspective of other people, including lacking an understanding about the motivations and intentions behind someone else's behavior, and the effects that their own behavior may have on others (Harwood & Farrar, 2006; Frith et al., 1994; Yirmiya et al, 1998). These deficits are also some of the social impairments experienced by those with Autism Spectrum Disorders (ASDs) (Baron-Cohen, Leslie, & Firth, 1985; Frith et al, 1994; Yirmiya et al, 1998).

The early research on the connections between theory of mind and autism examined the autistic child's theory of mind through the False-Belief task (Wimmer & Perner, 1983). The false-belief task requires an ability to attribute a thought to another person, making it a viable measure of theory of mind (Wimmer & Perner, 1983). In the false-belief task, participants are shown a scenario where a character is aware of the location of a specific object, but then another character hides the object when the original character leaves the room. The participant is then asked where the original character would look for the object when they came back into the room (Wimmer & Perner, 1983). In order to correctly complete the false-belief task, children would have to understand that the characters' knowledge of the location differs from the child's own knowledge

(Baron-Cohen et al., 1985; Wimmer & Perner, 1983). Baron-Cohen et al. (1985) gave this task to children with autism and found that only 20% of the autistic children were able separate their personal knowledge from the character's knowledge. This led the researchers to conclude that autistic individuals are unable to attribute thoughts to other people and therefore lack a fully developed theory of mind (Baron-Cohen et al., 1985).

Building off of the research by Baron-Cohen, Leslie and Firth (1985), additional studies that showed between theory of mind and autism looked specifically at an autistic individual's social deficits through the Faux-Pas Recognition Task (Stone, Baron-Cohen, & Knight, 1998; Gregory et al., 2002) . In the Faux-Pas Recognition task, researchers read stories to participants in which a character offends another character. Participants are then surveyed about the true intentions behind the characters' comments (Stone et al., 1998; Gregory et al., 2002). In one particular study, Zalla, Sav, Stopic, Ahade, and Leboyer (2009) employed this task with a group of Asperger patients. Asperger's Syndrome is a highly functioning form of autism (Zalla et al., 2009). Results showed that the participants actually overestimated the amount of faux-pas in the stories, such that they thought that characters insulted the other characters more than they actually did (Zalla et al., 2009) They were also not able to give correct reasoning for intentions of the speakers. Zalla et al. (2009) believes that people with autism perform worse on this task because of an impaired theory of mind.

An additional measure of theory of mind relies on an individual's ability to attribute emotional states to persons other than themselves. During the Reading the Mind in the Eyes task (Baron-Cohen & Wheelwright, 2001) participants are presented with

photographs of peoples' eyes and words describing different emotions, and participants are asked to chose the correct emotional state expressed from each photograph of eyes. In order to give correct answers, participants must be able to read the emotions by taking on the perspectives of the people in the photographs and correctly attributing their mental states (Baron-Cohen & Wheelwright, 2001). One such study employing this task examined the differences between high-functioning autistic individuals and typically-developing individuals in their ability to attribute emotional states (Baron-Cohen & Wheelwright, 2001). Baron- Cohen and Wheelwright (2001) administered the Reading the Mind in the Eyes task to a sample consisting of a clinical and normal population. Baron-Cohen and Wheelwright (2001) found that autistic individuals had more incorrect answers about the emotions being conveyed by the eyes than did individuals in the normal population, leading the researchers to believe that the autistic individuals lacked the ability to correctly attribute emotional states to other people. This study, along with the research done by Baron-Cohen et al. (1985) and Zalla et al, (1999), provides additional evidence about the strong relationship between autism and theory of mind deficits

While theory of mind has many different complex facets, it may be the explanation for the individual differences in the major personality construct of self-monitoring. It may be that low self-monitors do not purposefully attend to their internal states instead of environmental cues, but rather their theory of mind deficits prohibits them from being able to read the mental states of others. It may be that low self-monitors experience a stronger attitude-behavior consistency than high self-monitors because their

theory of mind deficits rid them of their abilityto take others' opinions into account when determining their behaviors (Baron-Cohen et al., 1985; DeBono & Omoto, 1993; Snyder & Monson, 1975). As previous research has shown (e.g., Baron-Cohen et al., 1985; Dardenne & Leyens, 1995; Klein et al., 2004), high self-monitors possess many of the social abilities that are also present in people with well-developed theory of minds. Although there are no studies that directly connect the two concepts, a significant portion of research in both theories has examined the same variables, and various connections can be seen across those studies

Research connecting Self-Monitoring and Theory of Mind

A fair amount of research has been performed with children examining the development of theory of mind, especially in regards to how theory of mind predicts a child's social skills. Suway, Degnan, Sussman, and Fox (2012) studied the relationship between theory of mind and peer interactions among children. They ran a longitudinal study, meeting with children who were 24 months of age and then again when they were 36 months. Suway et al. (2012) hypothesized that children who are high in negative peer interactions and negative social behaviors at 24 months would show worse theory of mind abilities at 36 months. Children were observed at 24 months and coded on positive and negative peer interactions. They were then tested a year later, at 36 months, on various theory of mind tasks. Results showed that children high in negative peer interaction and negative social behaviors performed worse on Theory of Mind tasks at 36 months. This research implied that negative peer interactions may harm theory of mind

development, but at the very least it shows a clear connection between having worse theory of mind abilities and more negative peer interactions.

While extensive research has been done on theory of mind and children, there are a significant lack of studies examining the characteristic of self-monitoring in children, with the exception of the research conducted by Graziano, Leone, Musser and Lautenschlager (1987). Graziano et al. (1987) set out to create a way to measure self-monitoring in children. They constructed the Junior Self-Monitoring scale, which consisted of 48 items intended to measure high or low self monitoring in children. Items were written with the intent of being appropriate for elementary school children and the interactions they faced in their daily settings (e.g., *I can be nice to people I don't like* and *I sometimes clown around so my classmates like me*) (Graziano et al., 1987). Graziano et al. (1987) tested the validity of this measure by administering it to second, third, fourth and fifth graders in an elementary school program. Participants were observed in their social interactions, particularly theirsocial comparison behaviors, before, during and after the completion of the survey. Children who scored as high self-monitors were more likely to engage in social-comparison interactions, as well as attend to the wants and decisions of other children much more frequently and for a longer duration than children who scored as low self-monitors (Graziano et al., 1987). Low self-monitors may not be able to attend to the decisions of other children because they may possess theory of mind deficits prohibiting them from differing between their own and others' mental states.

One could infer from Graziano et al.,'s (1987) research that high self monitoring children would tend to have more positive peer interactions. In connection, some

prosocial behaviors between children, such as sharing, that may lead to positive peer interactions have been shown to be positively correlated with a more well-developed theory of mind. Wu and Su (2014) ran a study on the relationship between preschoolers' theory of mind abilities and prosocial tendencies. The study specifically investigated the behavior of sharing. Wu and Su (2014) hypothesized that children with better theory of mind abilities would engage in more sharing behaviors, even with less straightforward social signals from the other child. Previous research had shown that children undergo an increase in the amount of initiated sharing behaviors at around the same age that theory of mind is shown to develop (Wu & Su, 2014). Wu and Su (2014) pooled a sample of children ranging in age from two to four years old. The children underwent a series of sharing tasks where they were placed in a room with a stranger who made both implicit (i.e., "These toys are so cool!") and explicit ("Would you please give me some to play with?") remarks meant to initiate sharing behaviors (Wu & Su, 2014). The children also completed five theory of mind tasks, including the previously researched False-Belief task (Wimmer & Perner, 1983). Results showed a significant age effect in both the Theory of Mind and sharing tasks, such that older children engaged in more sharing behaviors and performed better on the theory of mind tasks (Wu & Su, 2014). Results also showed that the children's theory of mind scores were positively correlated to their sharing scores, such that the participants who performed better on theory of mind tasks were also likely to engage in more sharing behaviors (Wu & Su, 2014). Wu and Su (2014) observed that children with a more developed Theory of Mind were more likely to share, even when their partner was making implicit and subtle comments about the toys,

as opposed to children with less developed theory of minds who more often had to be explicitly asked to share. This ties into previous research (e.g., Ajzen et al., 1982; DeBono & Omoto, 1993) suggesting that high self-monitors rely on situational cues to determine their behavior. Wu and Su (2014), along with Graziano et al., (1987) and Suway et al., (2012) shows that children high in negative peer interactions tend to do poorer on theory of mind tasks, as well as that being a high self-monitor is correlated with having more positive peer interactions, suggesting that high self-monitors may have more developed theory of minds than low self-monitors.

While there are studies connecting negative peer interactions to both theory of mind deficits and low self-monitors in children, do the same connections exist for adults? One explanation why individuals with theory of mind deficits experience more negative peer interactions is their struggle with recognizing emotions on faces (Baron-Cohen & Wheelwright, 2001). Wallace, Coleman, and Bailey (2008) found that those with Autism Spectrum Disorders struggled with recognizing the basic emotions of sadness, fear and anger due to their theory of mind deficits. Building upon that research, Mier et al. (2010) conducted research on how a well-developed theory of mind is related to recognizing emotions on others' faces. The study examined theory of mind from a neuroscience perspective by trying to show a connection using imaging studies. Mier et al. (2010) hypothesized that there would be a correlation between having a well-developed theory of mind and doing well on emotion recognition tasks and that that connection would be apparent on a neurobiological level. Participants were shown images of facial emotions and asked to rate the intensity of them on a five-point Likert scale, with *1* representing

the least intense and *5* the most (Mier et. al, 2010). Participants were also asked to complete a theory of mind inventory. While this was happening, the researchers ran fMRI imaging studies on the participants in an attempt to show the connection. Results showed activation around the inferior frontal gyrus, superior temporal sulcus,temporal pole and amygdala for both emotion recognition and theory of mind, suggesting a strong neural connection between the two (Mier et. al, 2010). Mier et. al (2010) demonstrated that the ability to correctly recognize emotions and having an well-developed theory of mind is strongly connected.

While difficulty with recognizing emotions has been shown to be connected with theory of mind deficits, could a possible connection be seen with self-monitoring as well? One such study researching self monitoring and emotion recognition was performed by Mufson and Nowicki (1991). Mufson and Nowicki (1991) conducted a study on nonverbal communication and specifically investigated emotional facial expressions. They tested how self-monitoring may predict a participant's abilities on the Brief Affect Recognition Test (BART). The BART measures participants' abilities to recognize the emotions of other people (Mufson & Nowicki, 1991). Some participants were told that the ability to recognize emotions is a predictor of social competence, while others were told that it was not (Mufson & Nowicki, 1991). Mufson and Nowicki (1991) found that high self-monitors were better at reading facial expressions than low self-monitors. This study is key to connecting self monitoring and theory of mind deficits, because one of the trademarks of theory of mind deficits is lacking the ability to accurately read others' emotions on their faces (Baron-Cohen & Wheelwright, 2001). Unsurprisingly, autistic

patients also tend to show difficulty in this area because of their theory of mind deficits (Wallace et al., 2008). Therefore, this could be another possible link between low self monitors and theory of mind deficits.

Another reason low self monitors and those with theory of mind deficits may struggle with social interactions is because of problems with comprehending the true meaning of what people are saying. Low self-monitors have been shown to have difficulty understanding the intentions behind other people's behaviors (Mill, 1984). Mill (1984) studied high and low self-monitors and their ability to interpret the meanings of others' sentences. Mill (1984) hypothesized that high self monitors would be better than low self monitors at decoding verbal cues accurately. Mill (1984) studied participants' ability to understand vocal cues correctly through the Inferred Meanings Test, where the researchers read out loud sentences to the participants and then asked them what the sentence was trying to convey (Mill, 1984). Results showed that higher self monitors were able to correctly infer more meanings and emotions than low self monitors. This shows a connection between low self monitors and their ability to correctly understand other people's intentions behind their behaviors through more subtle verbal cues.

Building off of Mill's (1984) research on verbal cues, additional research on self monitoring and social skill deficits has been performed using patients with schizophrenia. Penn et al. (1999) conducted research examining the connections between self monitoring and social cognition skills in schizophrenic patients. Participants with schizophrenia completed Snyder's (1974) Self Monitoring Scale and a task meant to assess their social skills, particularly their paralinguistic abilities. Paralinguistic abilities refers to a person's

capability to pick up on implicit cues in social interactions, such as body language or sarcastic tones (Penn et al., 1999). Penn et al. (1999) found that schizophrenic patients who scored as high self-monitors tended to have greater paralinguistic skills than those who were rated as low self-monitors. In connection to Mill's (1984) research, it seems that people who score as low self-monitors tend to struggle with understanding subtle verbal cues and true intentions in social situations.

Low self-monitors are known to struggle with paralinguistic skills in conversation (e.g. Mill, 1984; Penn et al., 1999) but can the same be said for people with theory of mind deficits? Having an impoverished theory of mind is a common trait among schizophrenic patients (Casetta & Goghari, 2014). Connecting to Penn et al.'s (1984) research on low self-monitoring schizophrenic patients and their social skills, Cassetta and Goghari (2014) investigated theory of mind deficits in relation to the social functioning of schizophrenic patients and their immediate family members. Casetta and Goghari (2014) tested participants using vignettes of social situations showing actors who were either lying or speaking sarcastically. The participant then had to answer questions about the scene, specifically about actor's intended meaning. The researchers found that schizophrenic patients with theory of mind deficits scored significantly lower on both sarcasm comprehension and lie comprehension (Cassetta & Goghari, 2014). They especially showed issues with understanding the intentions of the actors. This is yet another important possible connection between self monitoring and theory of mind. Sarcasm could be considered a paralinguistic skill since it relies on a person's tone and

delivery, so it may be that low self-monitors have theory of mind deficits contributing to their social intelligence.

The possible connections between self monitoring and theory of mind discussed above have led the current research to investigate a possible relationship between theory of mind and self-monitoring. Low self monitors have shown to experience the some of the same social impairments that those with theory of mind deficits experience (e.g. Cassetta & Goghari, 2014; Furnham & Capon, 1982; Graziano et al., 1987; Mier et. al, 2010; Mill, 1984). Low self-monitors may have a stronger attitude-behavior consistency (e.g., DeBono & Omoto, 1993) than high self-monitors because their theory of mind deficits prohibit them from relying on their environmental surroundings to determine their behavior, so they are forced to attend to their internal states. High self-monitors on the other hand have been shown to be very socially skilled people (e.g., Furnham & Capon, 1982, Mehra et al., 2001). Many of those social skills, especially the attribution of behaviors and perspective taking (Baron-Cohen & Wheelwright, 2001; Harwood & Farrar, 2006) have been shown to relate to theory of mind abilities, while low self-monitors lack these same skills. This leads the current research to speculate that there is a significant connection between the two concepts. Specifically, the current research hypothesizes that there will be a positive relationship between self-monitoring and theory of mind, such that high self-monitors will perform better on theory of mind tasks than low self-monitors. Based upon the previous research by Baron-Cohen et al. (1985) showing the connections between theory of mind deficits and autism, the current research

also hypothesizes that low self-monitors will score higher on the Autism Spectrum Quotient than high self-monitors.

Method

Materials

The current research tested theory of mind deficits through Adult Faux-Pas Recognition task (Stone et al., 1998; Gregory et al., 2002), where researchers read participants stories of social interactions and are asked to identify the social faux-pas (See Appendix A). The task consists of ten stories that include a social faux pas, such as a character insulting another character, and ten control stories that do not contain a faux-pas. Participants heard the story and were then asked a series of questions about the story. For example, a story containing a faux pas would be as follows: *Jill had just moved into a new apartment. Jill went shopping and bought some new curtains for her bedroom. When she had just finished decorating the apartment, her best friend, Lisa, came over. Jill gave her a tour of the apartment and asked, "How do you like my bedroom?" "Those curtains are horrible," Lisa said. "I hope you're going to get some new ones!"* (Stone et al., 1998; Gregory et al., 2002). Participants are then asked "*Did anyone say something they shouldn't have said or something awkward?*" If participants say yes, a series of questions meant to identify the specific faux-pas and the character's true intentions are asked. Control questions are also asked to make sure the participant is comprehending the story. For example, a control question for the story above would be "*How long had Jill lived in the apartment?*" (Stone et al., 1998; Gregory et al., 2002). Participants also had a copy of the stories without the questions placed in front of them in case they needed to refer back.

The Faux-Pas Recognition Task has been shown to have a good test-retest reliability and is a more sensitive and valid measurement of theory of mind (Zalla et al., 2009).

The second Theory of Mind task employed by the current research is the Revised Adult Version of the Reading the Mind in the Eyes Test (Baron-Cohen & Wheelwright, 2001). The task consists of 37 black and white photographs of peoples' eyes (See Appendix B). Each photograph is accompanied by four words describing an emotional state. One of the four words is a target emotion that accurately describes the emotion on the set of eyes, and the other three words are ones chosen that are close to the target emotion but not close enough to be incorrectly identified by those without theory of mind deficits. For example, if the target emotion is *nervous*, the other three words might be *puzzled*, *insisting*, and *contemplative* (Baron-Cohen & Wheelwright, 2001). Participants are asked to choose one of the four words to identify the emotion being conveyed by the set of eyes. They are provided with a glossary with the definitions of each emotional state, a sample sentence using that words, and an answer sheet to record their answer on (Baron-Cohen & Wheelwright, 2001). The current research employed the Revised Adult Version instead of the original version, as it is shown to be more reliable and valid because it uses photographs of complex emotional states instead of basic ones (Baron-Cohen & Wheelwright, 2001). Examples of basic emotional states include *sad*, *angry*, *happy*, while examples of complex emotional states found in the Revised Adult Version include *indifferent*, *baffled*, *ashamed*, and *playful* (Baron-Cohen & Wheelwright, 2001).

The current research measured self-monitoring through the widely used 18-item Revised Self Monitoring Scale (Snyder & Gangestad, 1986) (See Appendix C). High and

low self-monitors are categorized by their responses on the Self-Monitoring Scale (Snyder, 1974; Snyder & Gangestad, 1986). The self-monitoring scale that was originally written by Snyder (1974) consisted of 25 items about self-presentation and attitudes, but it had issues with validity and did not align with previous research (Briggs, Cheek, & Buss, 1980; Lennox & Wolfe, 1984). It was once rewritten into 13 items (Lennox & Wolfe, 1984), but was most recently written into an 18 item scale (Snyder & Gangestad, 1986). The widely-used 18 item scale includes items relating to a person's internal beliefs and their interactions with others, such as*I would not change my opinion (or the way I do things in order to please someone or win their favor* and *I find it hard to imitate the behavior of other people* (Snyder & Gangestad, 1986). Participants rate the items as either *true* or *false*. The revised 18-item version is considered more reliable and valid than the original version yet strongly correlates with the original 25-item measure (Snyder & Gangestad, 1986). When scoring the questionnaire, each statement answered "true" to is awarded one point but 10 of the statements are reverse scored. Participants scoring at a 10 and above are considered high self-monitors while those under 9 are low self-monitors.

The Autism-Spectrum Quotient (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001) was developed as a self-report measure to identify where individuals may lie on the autism spectrum (See Appendix D). It is used as a diagnostic tool for Autism Spectrum Disorders (Baron-Cohen et al., 2001). The self-report test consists of 50 items on five different areas analyzing autistic symptoms, including items such as *I usually notice car license plates or similar strings of information*, *I find social situations easy*,

and *When I talk on the phone, I'm not sure when it's my turn to speak* (Baron-Cohen et al., 2001). Participants are asked to think about the statements and respond using a four point Likert scale, where *1 = definitely disagree* and *4 = definitely agree.* Responses are scored by given one point for "agree" answers on certain items and one point for "disagree" items on other answers. Scores above 31 are thought to be indicative of an Autism Spectrum Disorder (Baron-Cohen et al., 2001). The current research employs the Autism-Spectrum Quotient because of autism's close relationship with theory of mind deficits (Baron-Cohen et al., 1985).

Participants

Sixty-six students and staff at Union College took part in the study to fulfill a psychology course requirement or for monetary compensation ($4). 46 females and 20 males participated in the study. Ages ranged from 17 to 77 years old (M = 21.33). Based on their scores on Snyder & Gangestad's (1986) 18-item Self Monitoring Scale, 32 of the participants were classified as high self-monitors (scored equal to 10 or greater) and 34 were classified as low self-monitors (scored 9 and under).

Procedure

Upon their arrival to the lab, each participant was informed that they were participating in a study on social skills and decision-making, and that they would answer questions about some stories as well as complete a variety of surveys. Participants completed an informed consent form. First, the researcher then administered the Adult Version of the Faux-Pas Recognition Task (Stone et al., 1998; Gregory et al., 2002). Participants were told that they were going to be read some stories about social situations

and then asked questions about those stories. Participants also had a copy of just the stories without the researchers' questions in front of them for reference. The researcher read out loud each story and asked the relevant questions for each story while writing down the participants' answers on the researcher's version of the task.

Participants next completed the Reading the Mind in the Eyes task (Baron-Cohen et al., 2001). Participants were told that they were going to be presented with pictures of eyes surrounded by four words, and instructed to choose the word that they felt best fit the emotion shown by the eyes.They were instructed not to rush and make sure they read all the words, but advised to complete the task as quickly as they could. Participants were also provided with a glossary of the words in case they were unaware of their meanings. Participants circled their answers on answer sheets. At this time, each participant recorded their age and gender on their Reading the Mind in the Eyes answer sheet. After the completion of the theory of mind tasks, participants then completed the Self Monitoring Scale (Snyder & Gangestad, 1986), which was labeled as a Personal Reaction Inventory. Lastly, participants completed the Autism Spectrum Quotient (Baron-Cohen et al., 2001) but they were unaware that it measured autistic tendencies. After participants finished all four tasks, they were thanked, debriefed, told the true nature of the study, and dismissed. Every participant took the study individually in the laboratory with only the researcher present. The complete study took each participant between 30 and 45 minutes.

Scoring the Tasks

The participants‘ answers to each task were scored according to the original researcher's answer key who developed the task. To score the Adult Faux-Pas

Recognition task (Stone et al., 1998; Gregory et al., 2002), the faux-pas stories and control stories were scored separately. For each of the ten control stories, participants received two points for correctly answering "no" when asked *Did anyone say something they shouldn't have said or something awkward?* (Stone et al., 1998; Gregory et al., 2002). Participants received zero points if they answered "yes" when read a control story (Stone et al., 1998; Gregory et al., 2002). There was a total of 20 possible points for the control stories. For each of the 10 faux pas stories, participants received one point for answering "yes" to the above question, as well as one point each for correctly identifying who made the faux-pas, why it was a faux-pas, the person's intentions in saying it, whether the person was aware of the situation and how the person felt (Stone et al., 1998; Gregory et al., 2002). If a participant answered the first question right but subsequent questions wrong, they were scored between one and six points depending on the number of questions they correctly answered. This results in six possible points for each of the 10 faux-pas stories, for a total of 60 possible points (Stone et al., 1998; Gregory et al., 2002). The control questions for both the faux-pas and control stories were asked only for reliability and were not scored. The scores for the control stories and the faux-pas stories were entered into the Statistical Package for Social Sciences (SPSS) separately.

To score the Reading the Mind in the Eyes task, the current research relied on the answer key developed by Baron-Cohen and Wheelwright (2001). Participants are scored one point for each emotion they correctly identified and zero points for incorrectly identifying it, for a total of 36 possible points. The raw score out of 36 was then entered into SPSS.

In order to analyze Snyder and Gangestad's (1986) 18-item self-monitoring scale, participants received both a numerical score and a self-monitoring categorization. Participants were given one point for each answer of "False" on items numbered 1, 2, 3, 7, 9, 11, 13, 14, 15 and 16, and were scored one point for each answer of "True" on items 4, 5, 6, 8, 10, 12, 17 and 18 (Snyder & Gangestad, 1986). The points were then added up for a total numerical score out of a possible 18 points. According to Snyder and Gangestad (1986), those with a score of 10 and above are classified as high self-monitors while those who score 9 and under are low self-monitors. Both the participant's numerical score and high/low categorization were entered into SPSS separately.

For the last task, the Autism Spectrum Quotient (Baron- Cohen et al., 2001), participants responded to 50 items on a 4 point Likert-type scale , 1 and 2 representing "Definitely agree" and "slightly agree" and 3 and 4 representing "Slightly disagree" and "definitely disagree" respectively (Baron-Cohen et al., 2001). Answers of "Definitely agree" or "slightly agree" were scored one point on items 1, 2, 4, 5, 6, 7, 9, 12, 13, 16, 18, 19, 20, 21, 22, 23, 26, 33, 35, 39, 41, 42, 43, 45 and 46. Responses of "Definitely disagree" or "slightly disagree" were scored one point on items 3, 8, 10, 11, 14, 15, 17, 24, 25, 27, 28, 29, 30, 31, 32, 34, 36, 37, 38, 40, 44, 47, 48, 49 and 50 (Baron-Cohen et al., 2001). The points were then added together for a total possible score of 50 points. The raw score was then entered into SPSS.

Results

To examine the association between participant's self-monitoring classifications (i.e. high or low self-monitors) and their performance on the theory of mind tasks, the

current research submitted participant's scores on the Reading the Mind in the Eyes Task, their score on the Faux-Pas stories and control stories from the Adult version of the Faux Pas recognition task and their raw score from the Autism Spectrum Quotient to an independent samples t-test (See Table 1). As hypothesized, high self-monitors and low self-monitors differed on their scores in the Reading the Mind in the Eyes task, t (64) = 3.52, p = .001, such that high self-monitors (M = 28.28) correctly identified more emotions than low self-monitors (M = 25.06). In connection, high self-monitors and low self-monitors also differed on their identification of social faux-pas in the Faux-Pas Recognition task, t (64) = 3.55, p = .001, such that high self- monitors (M = 54.06) correctly identified more social faux-pas than did low self-monitors (M = 46.91). There was no significant difference in the control stories of the Faux-Pas Recognition Task, t (64) = .58, p = .57, such that high self-monitors (M = 18.34) and low self-monitors (M = 18.00) both correctly identified when there was no faux-pas. High and low self-monitors also differed in terms of their scores on the Autism Spectrum Quotient, t (64) = -4.36, p < .001, such that low self-monitors (M = 21.21) scored higher and showed more autistic tendencies than high self-monitors (M = 14.41). There was no significant difference with age or gender.

To confirm the results found by the independent samples t-test, we also submitted participants' numerical self-monitoring score and theory of mind task scores to a Pearson's Correlation. As hypothesized, participants' numerical self-monitoring scores were positively correlated with their scores on the Faux Pas Recognition Task, r (64)= . 31, p = .01, such that high self-monitoring scores were associated with correctly

identifying social faux-pas. There was no significant association between participant's self-monitoring scores and their responses on the control stories in the Faux-Pas task, r (64) = .04, p = .73. Self-monitoring scores were also positively related to the scores on the Reading the Mind in the Eyes task, r (64) = .30, p = .01, such that high self-monitoring scores were associated with correctly identifying others' emotions. In align with the hypothesis, there was a negative relationship between participant's numerical self-monitoring scores and their score on the Autism Spectrum Quotient, r (64) = -.499, p < .001, such that lower self-monitoring scores were associated with higher scores on the Autism Spectrum Quotient. No significant association was found with the age or gender of the participants. These correlations using the numerical self-monitoring score confirms the results found in the independent samples t-test when participants were categorized as either high or low self-monitors.

Discussion

Previous research on self-monitoring has shown that high self-monitors constantly monitor and adjust their behavior to appropriately match their social settings while low self-monitors attend to their internal cues to keep their attitudes and behaviors consistent despite their surroundings (Ajzen et al., 1982; Snyder, 1979; Snyder & Gangestad, 1986). The current research set out to investigate individual differences in self-monitoring and how that relates to individual differences in another well-researched construct, theory of mind. Theory of mind is a person's ability to not only connect internal states to oneself and one's emotions, but also to understand that other people have their own needs, wishes and thoughts that may drive their behaviors (Premack & Woodruff, 1978; Baron-Cohen

& Wheelwright, 2001). Past studies have looked at many of the same variables within the two constructs but the connection between self-monitoring and theory of mind had yet to be discovered before the current research.

In the current research, it was hypothesized that high self-monitors would score higher on theory of mind tasks than low self-monitors. Since previous research has shown high self-monitors to be more socially skilled than low self-monitors (i.e. Mehra et al., 2001;Mill, 1984; Penn et al., 1999) it was hypothesized that high self-monitors would correctly identify more social faux-pas on the Adult Version of the Faux-Pas recognition task than low self-monitors. It was also hypothesized that low self-monitors would score significantly lower than high self-monitors on theory of mind tasks, therefore showing that low self-monitors have more theory of mind deficits than high self-monitors. Participants completed two theory of mind tasks: the Reading the Mind in the Eyes task (Baron-Cohen & Wheelwright, 2001) and the Adult version of the Faux-Pas Recognition task (Stone et al., 1998; Gregory et al., 2002), along Snyder & Gangestad's (1986) Self Monitoring Scale and the Autism Spectrum Quotient (Baron-Cohen et al., 2001). Results showed a positive relationship between participants' self-monitoring scores and theory of mind scores, and a negative correlation with participants' self-monitoring scores and Autism Spectrum Quotient scores. In general, participants who were high self-monitors scored higher on the two theory of mind tasks than low self-monitors. In addition, participants who were low self-monitors scored higher on the Autism Spectrum Quotient than high self-monitors. Thus, the current research's hypotheses were fully supported.

The correlations between high self-monitoring scores and high theory of mind scores leads the current research to conclude that low self-monitors have more impoverished theory of minds than high self-monitors. Although no published studies have explored a connection between the two constructs, previous research has shown that low self-monitors experience many of the same social skill impairments that those with theory of mind deficits have (Graziano et al., 1987; Mier et. al., 2010; Mill, 1984: Cassetta & Goghari, 2014). Even though there is no previous research analyzing the two constructs together to compare the current data to, previous research by Zalla et al. (2001) on the Adult Faux-Pas recognition task found that Asperger patients actually over-estimated the amount of faux-pas in the stories. Our data contradicts that, as can be seen through the separate scores for the faux-pas stories and the control stories. If those with theory of mind deficits had overestimated the amount of faux-pas then their scores on the control stories should reflect that. Our data showed that theory of mind deficits are shown through the person's inability to recognize correct intentions and social faux-pas.

The correlation between self-monitoring and theory of mind opens up a possible explanation for individual differences in self-monitoring. Although the current research is correlational therefore we are not able to attribute causal factors, previous research on the development of theory of mind and self-monitoring may shed some light on the explanation behind the results. Previous studies have shown theory of mind develops in children between four and five years old (e.g. Lillard & Kavanaugh, 2014; Morino, 2005; Wright & Mahfoud, 2012), while self-monitoring has been shown to develop slightly later between six and 12 years old (Graziano et al, 1987). It may be that low self-monitors

are forced to attend to their internal cues because their theory of mind deficits prevent them from being able to take on others' perspectives and differentiate them from their own thoughts. If low self-monitors are unable to take on the perspectives of others and understand that other people have different thoughts and intentions than them, then they are forced to attend to their internal state to determine their behavior. Low self-monitors may struggle with social skills because of their inability to take on others' perspectives, especially their intentions and beliefs. The current research shows this with the Faux-Pas recognition task, where low self-monitors struggled with understanding the characters' intentions and true meanings. Previous research with recognizing emotions in others have shown that high self-monitors are better at reading facial cues (Mufson & Nowicki, 1991), and this is backed up by the current study. Recognizing facial emotions also is related to having a well-developed theory of mind (Mier et. al., 2010). High self-monitors may be able to better attribute emotions to other people because they possess a more advanced theory of mind than low self-monitors. High self-monitors may be more socially skilled because their well-developed theory of minds allow them to better understand the motivating factors behind others' behaviors and align their behaviors with that. With theory of mind showing to develop slightly before self-monitoring, it may be that theory of mind deficits are the core explanation for individual differences in self-monitoring.

In addition to the theoretical connection between self-monitoring and theory of mind, this study has real-world implications as well. Although a variety of studies have been run on high and low self-monitors' individual differences in social skills, this

concept has not been studied from the focus of theory of mind. Previous research on self-monitoring in the workplace has shown that high self-monitors achieve more central leadership positions in their occupation than do low self-monitors (Mehra et al., 2001). High self-monitors also tend to have more work-related successes and stay in their jobs longer than low self-monitors (Mehra et al., 2001). When looking at these results from a theory of mind standpoint, it may be that high self-monitors occupy more central positions in their networks because they possess a well-developed theory of mind allowing them to take take on the perspectives of other employees and customers. By having a better understanding of the connections between theory of mind and self-monitoring, both employees and employers may be able to add or remove social events that may have an impact on the work environment. For instance, high self-monitors have been shown to better understand verbal cues and paralinguistic skills than low self-monitors (Mill, 1984; Penn et al., 1999). By understanding this as a theory of mind deficit instead of a personality variable, it may be easier to learn ways to compensate for it, or instance by having face to face meetings instead of phone conferences. If viewed as a deficit, employers may be more flexible in order to help their employees achieve their best work.

An additional implication of the current research has to do with clinical work. Theory of mind deficits are often toted as the major explanation behind ASDs and other mental disorders. Although research on both self-monitoring and theory of mind has been done with schizophrenic patients (i.e. Cassetta & Goghari, 2014; Penn et al., 1999;), the connections between the two constructs may help clinical psychologists in learning more

about the patients. By understanding that someone who may have theory of mind deficits is more likely to be a low self-monitor, then the doctors can attempt to get through to them in a variety of different ways that they may have not tried before. For instance, a doctor may put a patient with theory of mind deficits in a group class to help them develop proper social skills. Someone who is a low self-monitor would learn quicker and more efficiently by being given real life scenarios and asked what they would do in that scenario since it allows them to rely to their internal beliefs and attitudes. On the other hand, someone who is a high self-monitor may learn better by watching other people act out a scenario, since they attend more to the environment and people surrounding them.

Despite obtaining such significant results, the current research is not without its limitations. An important limitation to make note of is the possibility of researcher bias. One researcher, who was aware of the hypothesis, was responsible for sampling, collecting and analyzing all of the data. The Adult Faux-Pas Recognition Task involves the researcher reading stories and questions to the participant and recording their answers. Although the researcher made all efforts to stay as unbiased as possible, it is important to note the possibility that the researcher's interactions, specifically the tone and speed of voice, may have an influence on how the participants reacted to the social situations featured in the stories. As Mill (1984) showed in their research, high self-monitors are better than low self-monitors at decoding others' true intentions through verbal cues. Although the current research showed this same result through the Faux-Pas Recognition task, this result may be accentuated by the researchers' tone of voice while administering the task. It is important to note however, that the researcher was not aware

of the participants' self-monitoring scores before administering the Faux-Pas Recognition Task, so this limitation could not have affected the results. However, future studies using this measure should consider recording a researcher or computer asking the questions so they are asked in the exact same tone for each participant, in order to remove any possible risks.

Although the sample size was large enough to run multiple statistical analyses, the diversity of the sample leaves something to be desired. Participants were sampled completely from the Union College Community, with 64 out of the 66 participants being students between the ages of 17 and 22 years old. These students have all experienced some private liberal arts college education in the Northeast United States, so the sample is lacking data from a variety of participants of different ages, socioeconomic classes, or cultures.

Data on participants' intellectual disabilities, except for autism, were not collected and even so only a handful of participants scored high enough on the Autism Spectrum Quotient to indicate that they were on the spectrum. Even though a significant difference was seen between high and low self-monitors, the sample did not see participants scoring drastically low on theory of mind tasks, meaning the sample did not include participants with very severe theory of mind deficits. The lack of data on participants' intellectual disabilities is a limitation in itself, as other mental disabilities besides autism can result in theory of mind deficits. Future studies should expand the sample to include a variety of socioeconomic classes, cultures and different degrees of mental health to grasp a full

understanding of the degree to which theory of mind deficits and self-monitoring interconnect to play a role in determining one's behavior.

Future studies on the two constructs have a variety of directions to expand on the current research. One interesting direction would be to perform more research on children's self-monitoring characteristics and how it develops. Although a variety of research has been done on the development of theory of mind in children, only a handful of studies address self-monitoring. By researching the exact ages that self-monitoring starts to develop, future studies may be able to have a better understanding of the chicken and the egg scenario between the two constructs. In order to trace the development of both theory of mind and self-monitoring in children it would be important to run a longitudinal study using the same subjects throughout, in order to fully research how the two variables work together in determining one's behavior.

Another very interesting direction with future research has to do with the possibility of manipulating one's self-monitoring characteristics. Previous research on theory of mind deficits has shown that stimulant medication improves those deficits in children and adolescents with Attention Deficit Hyperactivity Disorder (ADHD) (Maoz et al., 2014). Stimulant medication, such as Adderall and Ritalin, has long been known for improving those with ADHD's executive functioning and cognitive abilities, but research by Maoz et al. (2014) show that it helps the child's empathetic abilities, as well as that children perform better on Theory of Mind tasks when they are taking the medication. Although self-monitoring has been previously thought to be a relatively stable characteristic (Snyder & Monson, 1975; Snyder & Tanke, 1975), the current research's

connection between theory of mind and self-monitoring questions this stability. If stimulants can improve a person's social abilities and theory of mind deficits, then is it possible that stimulant medication can also affect their person's self-monitoring characteristics? Future studies on ADHD patients should measure their self-monitoring before and after medication to see if self-monitoring reacts to medication the same way as theory of mind deficits.

The current research has shown an exciting connection between the two constructs of self-monitoring and theory of mind. It may be that low self-monitors attend to their internal state to determine their attitudes and behaviors because they have theory of mind deficits preventing them from taking on the perspectives of other. In connection, high self-monitors are more socially skilled than low self-monitors when in a variety of environments, such as the workplace, because they may possess better developed theory of minds. Future studies on these two constructs should attempt to expand the diversity of the sample, as well as research other variables that the two may connect through. Nevertheless, the current research recommends that future studies on both self-monitoring and theory of mind take these newfound connections into account.

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Table 1

Mean Scores and Standard Deviation for Theory of Mind Tasks

	Self-Monitoring Categorization	
Theory of Mind Tasks	Low	High
	Scores	
Faux Pas Recognition Task		
M	46.91	54.06
SD	9.68	6.18
Reading the Mind in the Eyes Task		
M	28.28	25.08
SD	3.66	3.77
Autism Spectrum Quotient		
M	14.41	21.21
SD	5.31	7.15

Appendix A

V. Stone FP test
S.Baron-Cohen

Faux Pas Recognition Test
(Adult Version)

Created by Valerie Stone & Simon Baron-Cohen

Correct citations for use of this test:

Stone, V.E., Baron-Cohen, S. & Knight, R.T. (1998). Frontal lobe contributions to theory of mind. *Journal of Cognitive Neuroscience*, 10, 640-656.

Gregory, C. , Lough, S., Stone, V.E., Erzinclioglu, S., Martin, L., Baron-Cohen, S. & Hodges, J. (2002). Theory of mind in frontotemporal dementia and Alzheimer's disease: Theoretical and practical implications. *Brain*, 125, 752-64.

The adult version was roughly based on the children's version of the test used in:

Baron-Cohen, S., O'Riordan, M., Jones, R., Stone, V.E. & Plaisted, K. (1999). A new test of social sensitivity: Detection of faux pas in normal children and children with Asperger syndrome. *Journal of Autism and Developmental Disorders*, 29, 407-418.

V. Stone FP test
S.Baron-Cohen

1. Vicky was at a party at her friend Oliver's house. She was talking to Oliver when another woman came up to them. She was one of Oliver's neighbors. The woman said, "Hello," then turned to Vicky and said, " I don't think we've met. I'm Maria, what's your name?" "I'm Vicky." "Would anyone like something to drink?" Oliver asked.

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Oliver know that Vicky and Maria did not know each other?

How do you think Vicky felt?

Control questions: In the story, where was Vicky?

Did Vicky and Maria know each other?

V. Stone FP test
S.Baron-Cohen

2. Helen's husband was throwing a surprise party for her birthday. He invited Sarah, a friend of Helen's, and said, "Don't tell anyone, especially Helen." The day before the party, Helen was over at Sarah's and Sarah spilled some coffee on a new dress that was hanging over her chair. "Oh!" said Sarah, "I was going to wear this to your party!" "What party?" said Helen. "Come on," said Sarah, "Let's go see if we can get the stain out."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Sarah remember that the party was a surprise party?

How do you think Helen felt?

Control question: In the story, who was the surprise party for?

What got spilled on the dress?

V. Stone FP test
S.Baron-Cohen

3. Jim was shopping for a shirt to match his suit. The salesman showed him several shirts. Jim looked at them and finally found one that was the right color. But when he went to the dressing room and tried it on, it didn't fit. "I'm afraid it's too small," he said to the salesman. "Not to worry," the salesman said. "We'll get some in next week in a larger size." "Great. I'll just come back then," Jim said.

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When he tried on the shirt, did Jim know they didn't have it in his size?

How do you think Jim felt?

Control question: In the story, what was Jim shopping for?

Why was he going to come back next week?

V. Stone FP test
S.Baron-Cohen

4. Jill had just moved into a new apartment. Jill went shopping and bought some new curtains for her bedroom. When she had just finished decorating the apartment, her best friend, Lisa, came over. Jill gave her a tour of the apartment and asked, "How do you like my bedroom?" "Those curtains are horrible," Lisa said. "I hope you're going to get some new ones!"

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Lisa know who had bought the curtains?

How do you think Jill felt?

Control question: In the story, what had Jill just bought?

How long had Jill lived in this apartment?

5. Bob went to the barber for a haircut. "How would you like it cut?" the barber asked. "I'd like the same style as I have now, only take about an inch off," Bob replied. The barber cut it a little uneven in the front, so he had to cut it shorter to even it out. "I'm afraid it's a bit shorter than you asked for," said the barber. "Oh well," Bob said, "it'll grow out."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

While he was getting the haircut, did Bob know the barber was cutting it too short?

How do you think Bob felt?

Control question: In the story, how did Bob want his hair cut?

How did the barber cut his hair?

6. John stopped off at the gas station on the way home to fill up his car. He gave the cashier his credit card. The cashier ran it through the machine at the counter. "I'm sorry," she said, "the machine won't accept your card." "Hmmm, that's funny," John said. "Well, I'll just pay in cash." He gave her twenty dollars and said, "I filled up the tank with unleaded."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When he handed his card to the cashier, did John know the machine wouldn't take his card?

How do you think John felt?

Control question: In the story, what did John stop off to buy?

Why did he pay in cash?

7. Sally is a three-year-old girl with a round face and short blonde hair. She was at her Aunt Carol's house. The doorbell rang and her Aunt Carol answered it. It was Mary, a neighbor. "Hi," Aunt Carol said, "Nice of you to stop by." Mary said, "Hello," then looked at Sally and said, "Oh, I don't think I've met this little boy. What's your name?"

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Mary know that Sally was a girl?

How do you think Sally felt?

Control question: In the story, where was Sally?

Who came to visit?

8. Joan took her dog, Zack, out to the park. She threw a stick for him to chase. When they had been there a while, Pam, a neighbor of hers, passed by. They chatted for a few minutes. Then Pam asked, "Are you heading home? Would you like to walk together?" "Sure," Joan said. She called Zack, but he was busy chasing pigeons and didn't come. "It looks like he's not ready to go," she said. "I think we'll stay." "OK," Pam said. "I'll see you later."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When she invited her, did Pam know that Joan wouldn't be able to walk home with her?

How do you think Pam felt?

Control question: In the story, where had Joan taken Zack?

Why didn't she walk with her friend Pam?

9. Joanne had had a major role in last year's school play and she really wanted the lead role this year. She took acting classes, and in the spring, she auditioned for the play. The day the decisions were posted, she went before class to check the list of who had made the play. She hadn't made the lead and had instead been cast in a minor role. She ran into her boyfriend in the hall and told him what had happened. "I'm sorry," he said. "You must be disappointed." "Yes," Joanne answered, "I have to decide whether to take this role."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When he first ran into her in the hall, did Joanne's boyfriend know that she hadn't gotten the role?

How do you think Joanne felt?

Control question: In the story, what role did Joanne get?

What kind of role had she had the previous year?

What did her boyfriend say?

10. Joe was at the library. He found the book he wanted about hiking in the Grand Canyon and went up to the front counter to check it out. When he looked in his wallet, he discovered he had left his library card at home. "I'm sorry," he said to the woman behind the counter. "I seem to have left my library card at home." "That's OK," she answered. "Tell me your name, and if we have you in the computer, you can check out the book just by showing me your driver's license."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When Joe went into the library, did he realize he didn't have his library card?

How do you think Joe felt?

Control question: In the story, what book did Joe get at the library?

Was he going to be able to check it out?

11. Jean West, a manager in Abco Software Design, called a meeting for all of the staff. "I have something to tell you," she said. "John Morehouse, one of our accountants, is very sick with cancer and he's in the hospital." Everyone was quiet, absorbing the news, when Robert, a software engineer, arrived late. "Hey, I heard this great joke last night!" Robert said. "What did the terminally ill patient say to his doctor?" Jean said, "Okay, let's get down to business in the meeting."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When he came in, did Robert know that the accountant was sick with cancer?

How do you think Jean, the manager, felt?

Control question: In the story, what did Jean, the manager, tell the people in the meeting?

Who arrived late to the meeting?

12. Mike, a nine-year-old boy, just started at a new school. He was in one of the stalls in the restroom at school. Joe and Peter, two other boys, came in and were standing at the sinks talking. Joe said, "You know that new guy in the class? His name's Mike. Doesn't he look weird? And he's so short!" Mike came out of the stall and Joe and Peter saw him. Peter said, "Oh hi, Mike! Are you going out to play football now?"

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When Joe was talking to Peter, did he know that Mike was in one of the stalls?

How do you think Mike felt?

Control question: In the story, where was Mike while Joe and Peter were talking?

What did Joe say about Mike?

13. Kim's cousin, Scott, was coming to visit and Kim made an apple pie especially for him. After dinner, she said, "I made a pie just for you. It's in the kitchen." "Mmmm," replied Scott, "It smells great! I love pies, except for apple, of course."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When he smelled the pie, did Scott know it was an apple pie?

How do you think Kim felt?

Control question: In the story, what kind of pie did Kim make?

How did Kim and Scott know each other?

14. Jeanette bought her friend, Anne, a crystal bowl for a wedding gift. Anne had a big wedding and there were a lot of presents to keep track of. About a year later, Jeanette was over one night at Anne's for dinner. Jeanette dropped a wine bottle by accident on the crystal bowl and the bowl shattered. "I'm really sorry. I've broken the bowl," said Jeanette. "Don't worry," said Anne. "I never liked it anyway. Someone gave it to me for my wedding."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Anne remember that Jeannette had given her the bowl?

How do you think Jeanette felt?

Control question: In the story, what did Jeanette give Anne for her wedding?

How did the bowl get broken?

15. At Fernhaven Elementary School, there was a story competition. Everyone was invited to enter. Several of the fifth graders did so. Christine, a fifth grader, loved the story she had entered in the competition. A few days later, the results of the competition were announced: Christine's story had not won anything and a classmate, Jake, had won first prize. The following day, Christine was sitting on a bench with Jake. They were looking at his first prize trophy. Jake said, "It was so easy to win that contest. All of the other stories in the competition were terrible." "Where are you going to put your trophy?" asked Christine.

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Jake know that Christine had entered a story in the contest?

How do you think Christine felt?

Control question: In the story, who won the contest?

Did Christine's story win anything?

16. Tim was in a restaurant. He spilled some coffee on the floor by accident. "I'll get you another cup of coffee," said the waiter. The waiter was gone for a while. Jack was another customer in the restaurant, standing by the cashier waiting to pay. Tim went up to Jack and said, "I spilled coffee over by my table. Can you mop it up?"

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Tim know that Jack was another customer?

How do you think Jack felt?

Control question: In the story, why was Jack standing by the cashier?

What did Tim spill?

17. Eleanor was waiting at the bus stop. The bus was late and she had been standing there a long time. She was 65 and it made her tired to stand for so long. When the bus finally came, it was crowded and there were no seats left. She saw a neighbor, Paul, standing in the aisle of the bus. "Hello, Eleanor," he said. "Were you waiting there long?" "About 20 minutes," she replied. A young man who was sitting down got up. "Ma'am, would you like my seat?"

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When Eleanor got on the bus, did Paul know how long she had been waiting?

How do you think Eleanor felt?

Control question: In the story, why was Eleanor waiting at the bus stop for 20 minutes?

Were there any seats available on the bus when she got on?

18. Roger had just started work at a new office. One day, in the coffee room, he was talking to a new friend, Andrew. "What does your wife do?" Andrew asked. "She's a lawyer," answered Roger. A few minutes later, Claire came into the coffee room looking irritated. "I just had the worst phone call," she told them. "Lawyers are all so arrogant and greedy. I can't stand them." "Do you want to come look over these reports?" Andrew asked Claire. "Not now," she replied, "I need my coffee."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Claire know that Roger's wife was a lawyer?

How do you think Roger felt?

Control question: In the story, what does Roger's wife do for a living?

Where were Roger and Andrew talking?

19. Richard bought a new car, a red Peugeot. A few weeks after he bought it, he backed it into his neighbor Ted's car, an old beat-up Volvo. His new car wasn't damaged at all and he didn't do much damage to Ted's car either -- just a scratch in the paint above the wheel. Still, he went up and knocked on the door. When Ted answered, Richard said, "I'm really sorry. I've just put a small scratch on your car." Ted looked at it and said, "Don't worry. It was only an accident."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

Did Richard know what his neighbor Ted's reaction would be?

How do you think Ted felt?

Control question: In the story, what did Richard do to Ted's car?

How did Ted react?

20. Louise went to the butcher to buy some meat. It was crowded and noisy in the shop. She asked the butcher, "Do you have any free-range chickens?" He nodded and started to wrap up a roasted chicken for her. "Excuse me," she said, "I must not have spoken clearly. I asked if you had any free-range chickens." "Oh, sorry," the butcher said, "we're all out of them."

Did anyone say something they shouldn't have said or something awkward?

If yes, ask:
Who said something they shouldn't have said or something awkward?

Why shouldn't he/she have said it or why was it awkward?

Why do you think he/she said it?

When he started wrapping up a chicken for Louise, did the butcher know that she wanted a free-range chicken?

How do you think Louise felt?

Control question: In the story, where did Louise go?

Why did the butcher start to wrap up a roasted chicken for her?

V. Stone FP test
S.Baron-Cohen

Administering the faux pas task:
Print out a version of the test that has just the stories, not the questions you ask. Put this in front of the participant. Say, "I'm going to be reading you some brief stories and asking you some questions about it. You have a copy of the story in front of you so you can read along and go back to it."

Then read the stories out loud and ask the questions. If they say to the first question, no, no one said anything they shouldn't have said or that was awkward, skip to the control questions for that story.
Make sure you ask the control questions, whether or not they say "yes or no" about someone saying something awkward.

Scoring the faux pas task:

Basically, use common sense. For each story containing a faux pas (stories 2, 4, 7, 11-16, and 18), the subject gets 1 point for each question answered correctly.

First question: "Did anyone say something they shouldn't have said?"

Faux pas stories:	Correct: Yes	Incorrect: No
Control stories:	Incorrect: Yes	Correct: No

Second question: "Who said something they shouldn't have said?"

Any answer that unambiguously identifies the correct person is correct.

story about calling little girl a boy: Mary (also acceptable: the neighbor)

story about crystal bowl: Anne (also acceptable: the hostess, or the woman who got married, etc.)

story about lawyers: Claire (also acceptable: the woman, or the woman in a bad mood, etc.)

story about curtains: Lisa (also acceptable: the friend)

story about cancer joke: Robert (also acceptable: the guy who came in late)

story about losing story contest: Jake (also acceptable: the guy who won)

story about spilled coffee: Tim (also acceptable: the guy who spilled his coffee)

story about new kid in school: Joe (also acceptable: Joe and Peter)

story about surprise party: Sarah (also acceptable: the woman who spilled the coffee)

story about pie: Joe (also acceptable: Kim's cousin)

Subjects who answer "no" to the first question don't get asked this question and score a 0 for this one.

Third question: "Why shouldn't they have said it?"

Any reasonable answer that makes reference to the faux pas is acceptable. The subject does not have to explicitly mention mental states, as in, "He didn't know about the guy who was sick with cancer, but everyone else did." It is sufficient to say, "Because John is terminally ill," or "because the guy standing right there is married to a lawyer," or "you shouldn't walk into a new apartment and criticize it; you don't know who bought what." This question only gets scored as incorrect if the person's answer doesn't reflect an understanding of the faux pas, that is, of what would have been offensive. Examples (from amygdala patients): "The neighbor shouldn't have called her little. Kids like to feel grown up." (Misses the point that Sally is a girl, not a boy.) "Claire shouldn't tell him she needs her coffee." (Misses the insult to Roger.) "You shouldn't come into a meeting late." (Doesn't mention the inappropriate joke.)

Subjects who answer "no" to the first question don't get asked this question, and score a 0 for this one.

Fourth question: "Why did they say it?" or "Why do you think they said it?"

Again, any reasonable answer that makes reference to the faux pas is acceptable. As long as the subject's answer indicates that they understand that one of the story characters didn't know something or didn't realize something, it is correct, even if they do not explicitly mention mental states. This question gets scored as incorrect if the subject seems to think that the person said it deliberately. Some more examples, also from patients: "Tim shouldn't order around other customers. He just basically went up to an equal and said, 'On your knees, boy.'" (Doesn't reflect an understanding that Tim mistook Jack for someone who worked at the restaurant.) "He was trying to put Christine down, make himself one up by gloating." (Doesn't reflect that he didn't know Christine was in the contest.) "She was trying to make Helen feel jealous." (Looks like a confabulation, and doesn't mention surprise party.) Some patients also just say, "I don't know," which also gets a zero.

Subjects who answer "no" to the first question don't get asked this question, and score a 0 for this one.

Fifth question: Did X know that Y? Again, this is to test whether they realize the faux pas was unintentional. Scoring is straightforward.

Sixth question: How did X feel? A test of subjects' empathy for the story characters. Should reflect feelings of hurt, anger, embarrassment, disappointment, as appropriate.

Seventh and eighth questions: Control questions. These should tell you if the person has gotten confused and forgotten the details of the story. Answers are pretty obvious. These are scored separately from the other questions.

Examples for faux pas stories,

In the story, where was Sally? "At her aunt Carol's house." (I think one subject said, "In the doorway next to her aunt," and I scored it as correct.)
In the story, what had Jeannette given Anne for her wedding? "A crystal bowl," "a bowl."
In the story, what did Robert's wife do for a living? "She was a lawyer."
In the story, what had Jill just bought? "New curtains," "curtains."
In the story, what had Jean West just told people in the meeting? "VP had cancer."
In the story, who won the competition? "Jake."
In the story, where was Jack standing? "By the cashier."
In the story, where was Mike while Joe and Peter were talking? "In the stalls (cubicles)."
In the story, who was Helen's husband throwing a surprise party for? "Helen."
In the story, what kind of pie had Kim made? "Apple."

Dorsolateral frontal patients, for example, often got some of these wrong. One patient said the surprise party was for Sarah's birthday, and that Helen was upset because her husband was throwing a party for another woman, and she wondered if they were having an affair.

All subjects get asked these questions, even if they answer "no" to the first question.

Overall, there are a total of 60 points that subjects can get on the faux-pas-related questions on the 10 faux pas stories. Someone who answers "no" to the first question for a story will get 0 points for that whole story. On the 10 control stories, score 2 points if they get it correct that no one said anything they shouldn't have said, 0 if they say someone said something they shouldn't have said, for a total of 20 points on the control stories. Score 1 point each for control questions on these stories.

Report separate scores for faux-pas-related questions on the faux pas stories, control questions on the faux pas stories, the faux-pas-related question on the control stories, and the control questions on the control stories. Then you can get a feel for if they are making more faux-pas-related errors (theory of mind errors) than errors on the factual control questions.

If anyone answers any of the control questions incorrectly, their other errors for that story should be interpreted with caution. You can throw out their other answers for that story and score their answers on the remaining stories, calculating a percent correct out of 54 points total, or 48 or whatever.

Discrepancies between answers to the first question and to the fifth question should be noted.

Appendix B

For all users of the revised version of the Adult "Reading the Mind in the Eyes" Test.

Enclosed you will find

- the adult version of the above test
- the word definition handout,
- the correct answers.
- A copy of the paper describing the test in full

As you know, publication details of the original version appeared in the Journal of Child Psychology and Psychiatry, 38, 813-822 (1997). The revised version which we have sent you was published in the Journal of Child Psychiatry and Psychiatry, 42, 241-252 (2001).

A child version of this test has also been developed and is available upon request. It was published in the Journal of Developmental and Learning Disorders, 5, 47-78 (2001).

We would, of course, appreciate hearing of any results you obtain with this test.

Thank you.

Best wishes

Simon Baron-Cohen

Adult Eyes Instructions

For each set of eyes, choose and circle which word best describes what the person in the picture is thinking or feeling. You may feel that more than one word is applicable but please choose just one word, the word which you consider to be most suitable. Before making your choice, make sure that you have read all 4 words. You should try to do the task as quickly as possible but you will not be timed. If you really don't know what a word means you can look it up in the definition handout.

WORD DEFINITIONS

ACCUSING	blaming The policeman was **accusing** the man of stealing a wallet.
AFFECTIONATE	showing fondness towards someone Most mothers are **affectionate** to their babies by giving them lots of kisses and cuddles.
AGHAST	horrified, astonished, alarmed Jane was **aghast** when she discovered her house had been burgled.
ALARMED	fearful, worried, filled with anxiety Claire was **alarmed** when she thought she was being followed home.
AMUSED	finding something funny I was **amused** by a funny joke someone told me.
ANNOYED	irritated, displeased Jack was **annoyed** when he found out he had missed the last bus home.
ANTICIPATING	expecting At the start of the football match, the fans were **anticipating** a quick goal.
ANXIOUS	worried, tense, uneasy The student was feeling **anxious** before taking her final exams.
APOLOGETIC	feeling sorry The waiter was very **apologetic** when he spilt soup all over the customer.
ARROGANT	conceited, self-important, having a big opinion of oneself The **arrogant** man thought he knew more about politics than everyone else in the room.
ASHAMED	overcome with shame or guilt The boy felt **ashamed** when his mother discovered him stealing money from her purse.

ASSERTIVE	confident, dominant, sure of oneself The **assertive** woman demanded that the shop give her a refund.
BAFFLED	confused, puzzled, dumbfounded The detectives were completely **baffled** by the murder case.
BEWILDERED	utterly confused, puzzled, dazed The child was **bewildered** when visiting the big city for the first time.
CAUTIOUS	careful, wary Sarah was always a bit **cautious** when talking to someone she did not know.
COMFORTING	consoling, compassionate The nurse was **comforting** the wounded soldier.
CONCERNED	worried, troubled The doctor was **concerned** when his patient took a turn for the worse.
CONFIDENT	self-assured, believing in oneself The tennis player was feeling very **confident** about winning his match.
CONFUSED	puzzled, perplexed Lizzie was so **confused** by the directions given to her, she got lost.
CONTEMPLATIVE	reflective, thoughtful, considering John was in a **contemplative** mood on the eve of his 60th birthday.
CONTENTED	satisfied After a nice walk and a good meal, David felt very **contented.**
CONVINCED	certain, absolutely positive Richard was **convinced** he had come to the right decision.
CURIOUS	inquisitive, inquiring, prying Louise was **curious** about the strange shaped parcel.
DECIDING	making your mind up The man was **deciding** whom to vote for in the election.

DECISIVE	already made your mind up Jane looked very **decisive** as she walked into the polling station.
DEFIANT	insolent, bold, don't care what anyone else thinks The animal protester remained **defiant** even after being sent to prison.
DEPRESSED	miserable George was **depressed** when he didn't receive any birthday cards.
DESIRE	passion, lust, longing for Kate had a strong **desire** for chocolate.
DESPONDENT	gloomy, despairing, without hope Gary was **despondent** when he did not get the job he wanted.
DISAPPOINTED	displeased, disgruntled Manchester United fans were **disappointed** not to win the Championship.
DISPIRITED	glum, miserable, low Adam was **dispirited** when he failed his exams.
DISTRUSTFUL	suspicious, doubtful, wary The old woman was **distrustful** of the stranger at her door.
DOMINANT	commanding, bossy The sergeant major looked **dominant** as he inspected the new recruits.
DOUBTFUL	dubious, suspicious, not really believing Mary was **doubtful** that her son was telling the truth.
DUBIOUS	doubtful, suspicious Peter was **dubious** when offered a surprisingly cheap television in a pub.
EAGER	keen On Christmas morning, the children were **eager** to open their presents.
EARNEST	having a serious intention Harry was very **earnest** about his religious beliefs.

EMBARRASSED	ashamed After forgetting a colleague's name, Jenny felt very **embarrassed.**
ENCOURAGING	hopeful, heartening, supporting All the parents were **encouraging** their children in the school sports day.
ENTERTAINED	absorbed and amused or pleased by something I was very **entertained** by the magician.
ENTHUSIASTIC	very eager, keen Susan felt very **enthusiastic** about her new fitness plan.
FANTASIZING	daydreaming Emma was **fantasizing** about being a film star.
FASCINATED	captivated, really interested At the seaside, the children were **fascinated** by the creatures in the rock pools.
FEARFUL	terrified, worried In the dark streets, the women felt **fearful.**
FLIRTATIOUS	brazen, saucy, teasing, playful Connie was accused of being **flirtatious** when she winked at a stranger at a party.
FLUSTERED	confused, nervous and upset Sarah felt a bit **flustered** when she realised how late she was for the meeting and that she had forgotten an important document.
FRIENDLY	sociable, amiable The **friendly** girl showed the tourists the way to the town centre.
GRATEFUL	thankful Kelly was very **grateful** for the kindness shown by the stranger.
GUILTY	feeling sorry for doing something wrong Charlie felt **guilty** about having an affair.
HATEFUL	showing intense dislike The two sisters were **hateful** to each other and always fighting.

HOPEFUL	optimistic Larry was **hopeful** that the post would bring good news.
HORRIFIED	terrified, appalled The man was **horrified** to discover that his new wife was already married.
HOSTILE	unfriendly The two neighbours were **hostile** towards each other because of an argument about loud music.
IMPATIENT	restless, wanting something to happen soon Jane grew increasingly **impatient** as she waited for her friend who was already 20 minutes late.
IMPLORING	begging, pleading Nicola looked **imploring** as she tried to persuade her dad to lend her the car.
INCREDULOUS	not believing Simon was **incredulous** when he heard that he had won the lottery.
INDECISIVE	unsure, hesitant, unable to make your mind up Tammy was so **indecisive** that she couldn't even decide what to have for lunch.
INDIFFERENT	disinterested, unresponsive, don't care Terry was completely **indifferent** as to whether they went to the cinema or the pub.
INSISTING	demanding, persisting, maintaining After a work outing, Frank was **insisting** he paid the bill for everyone.
INSULTING	rude, offensive The football crowd was **insulting** the referee after he gave a penalty.
INTERESTED	inquiring, curious After seeing Jurassic Park, Hugh grew very **interested** in dinosaurs.
INTRIGUED	very curious, very interested A mystery phone call **intrigued** Zoe.

IRRITATED	exasperated, annoyed Frances was **irritated** by all the junk mail she received.
JEALOUS	envious Tony was **jealous** of all the taller, better-looking boys in his class.
JOKING	being funny, playful Gary was always **joking** with his friends.
NERVOUS	apprehensive, tense, worried Just before her job interview, Alice felt very **nervous**.
OFFENDED	insulted, wounded, having hurt feelings When someone made a joke about her weight, Martha felt very **offended**.
PANICKED	distraught, feeling of terror or anxiety On waking to find the house on fire, the whole family was **panicked**.
PENSIVE	thinking about something slightly worrying Susie looked **pensive** on the way to meeting her boyfriend's parents for the first time.
PERPLEXED	bewildered, puzzled, confused Frank was **perplexed** by the disappearance of his garden gnomes.
PLAYFUL	full of high spirits and fun Neil was feeling **playful** at his birthday party.
PREOCCUPIED	absorbed, engrossed in one's own thoughts Worrying about her mother's illness made Debbie **preoccupied** at work
PUZZLED	perplexed, bewildered, confused After doing the crossword for an hour, June was still **puzzled** by one clue.
REASSURING	supporting, encouraging, giving someone confidence Andy tried to look **reassuring** as he told his wife that her new dress did suit her.

REFLECTIVE	contemplative, thoughtful George was in a **reflective** mood as he thought about what he'd done with his life.
REGRETFUL	sorry Lee was always **regretful** that he had never travelled when he was younger.
RELAXED	taking it easy, calm, carefree On holiday, Pam felt happy and **relaxed**.
RELIEVED	freed from worry or anxiety At the restaurant, Ray was **relieved** to find that he had not forgotten his wallet.
RESENTFUL	bitter, hostile The businessman felt very **resentful** towards his younger colleague who had been promoted above him.
SARCASTIC	cynical, mocking, scornful The comedian made a **sarcastic** comment when someone came into the theatre late.
SATISFIED	content, fulfilled Steve felt very **satisfied** after he had got his new flat just how he wanted it.
SCEPTICAL	doubtful, suspicious, mistrusting Patrick looked **sceptical** as someone read out his horoscope to him.
SERIOUS	solemn, grave The bank manager looked **serious** as he refused Nigel an overdraft.
STERN	severe, strict, firm The teacher looked very **stern** as he told the class off.
SUSPICIOUS	disbelieving, suspecting, doubting After Sam had lost his wallet for the second time at work, he grew **suspicious** of one of his colleagues.
SYMPATHETIC	kind, compassionate The nurse looked **sympathetic** as she told the patient the bad news.

TENTATIVE	hesitant, uncertain, cautious Andrew felt a bit **tentative** as he went into the room full of strangers.
TERRIFIED	alarmed, fearful The boy was **terrified** when he thought he saw a ghost.
THOUGHTFUL	thinking about something Phil looked **thoughtful** as he sat waiting for the girlfriend he was about to finish with.
THREATENING	menacing, intimidating The large, drunken man was acting in a very **threatening** way.
UNEASY	unsettled, apprehensive, troubled Karen felt slightly **uneasy** about accepting a lift from the man she had only met that day.
UPSET	agitated, worried, uneasy The man was very **upset** when his mother died.
WORRIED	anxious, fretful, troubled When her cat went missing, the girl was very **worried**.

practice

jealous panicked

arrogant hateful

1

playful comforting

irritated bored

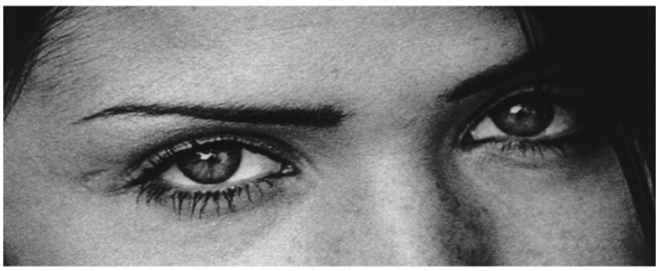
2

terrified upset

arrogant annoyed

3

joking flustered



desire convinced

4

joking insisting

amused relaxed

5

irritated sarcastic

worried friendly

6

aghast fantasizing

impatient alarmed

7

apologetic friendly

uneasy dispirited

8

despondent relieved

shy excited

9

annoyed hostile

horrified preoccupied

10

cautious insisting

bored aghast

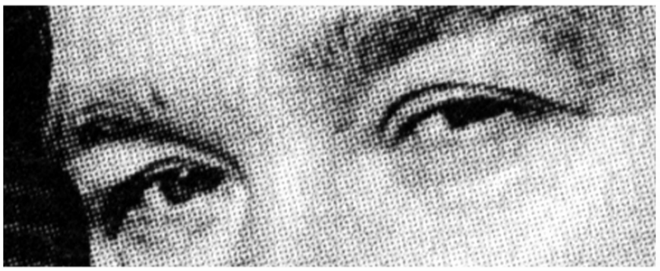
11

terrified amused

regretful flirtatious

12

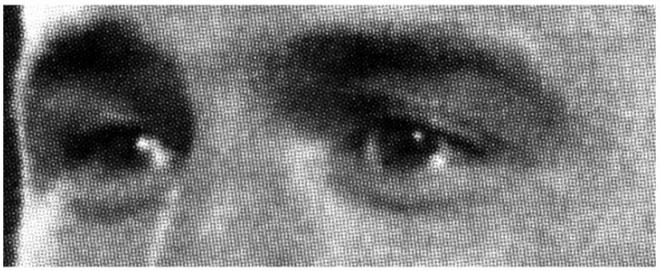
indifferent embarrassed



sceptical dispirited

13

decisive anticipating



threatening shy

irritated

disappointed

depressed

accusing

15

contemplative flustered

encouraging amused

16

irritated thoughtful

encouraging sympathetic

17

doubtful affectionate

playful aghast

decisive amused

aghast bored

19

arrogant grateful

sarcastic tentative

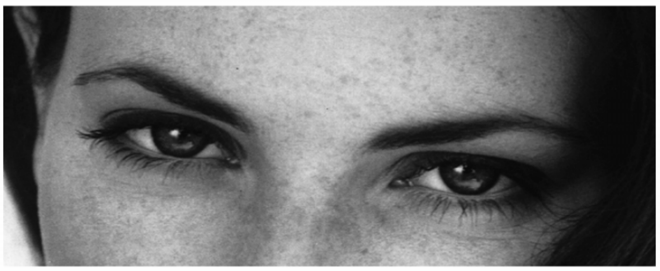
20

dominant friendly

guilty horrified

21

embarrassed fantasizing



confused panicked

22

preoccupied grateful

insisting imploring

23

contented apologetic

defiant curious

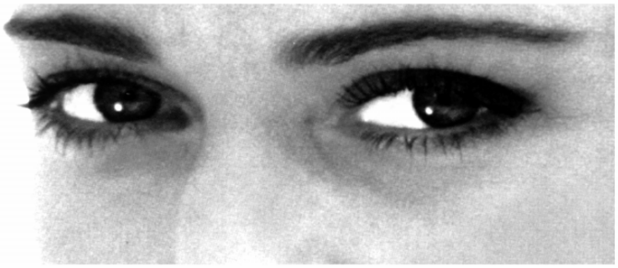
24

pensive irritated

excited hostile

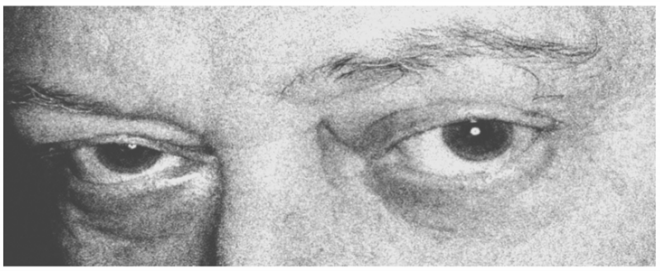
25

panicked incredulous



despondent interested

alarmed shy



hostile anxious

27

joking cautious

arrogant reassuring

interested joking

affectionate contented

29

impatient aghast

irritated reflective

30

grateful flirtatious

hostile disappointed

31

ashamed confident

joking dispirited

32

serious ashamed

bewildered alarmed

33

embarrassed guilty

fantasizing concerned

aghast

baffled

distrustful

terrified

puzzled nervous

insisting contemplative

36

ashamed nervous

suspicious indecisive

Record Sheet

Age:..... Today's date:.....

.Gender: .....

P				
1	jealous	panicked	arrogant	hateful
2	playful	comforting	irritated	bored
3	terrified	upset	arrogant	annoyed
4	joking	flustered	desire	convinced
5	joking	insisting	amused	relaxed
6	irritated	sarcastic	worried	friendly
7	aghast	fantasizing	impatient	alarmed
8	apologetic	friendly	uneasy	dispirited
9	despondent	relieved	shy	excited
10	annoyed	hostile	horrified	preoccupied
11	cautious	insisting	bored	aghast
12	terrified	amused	regretful	flirtatious
13	indifferent	embarrassed	sceptical	dispirited
14	decisive	anticipating	threatening	shy
15	irritated	disappointed	depressed	accusing
16	contemplative	flustered	encouraging	amused
17	irritated	thoughtful	encouraging	sympathetic
18	doubtful	affectionate	playful	aghast
19	decisive	amused	aghast	bored
20	arrogant	grateful	sarcastic	tentative
21	dominant	friendly	guilty	horrified
22	embarrassed	fantasizing	confused	panicked
23	preoccupied	grateful	insisting	imploring
24	contented	apologetic	defiant	curious
25	pensive	irritated	excited	hostile
26	panicked	incredulous	despondent	interested
27	alarmed	shy	hostile	anxious
28	joking	cautious	arrogant	reassuring
29	interested	joking	affectionate	contented
30	impatient	aghast	irritated	reflective
31	grateful	flirtatious	hostile	disappointed
32	ashamed	confident	joking	dispirited
33	serious	ashamed	bewildered	alarmed
34	embarrassed	guilty	fantasizing	concerned
35	aghast	baffled	distrustful	terrified
36	puzzled	nervous	insisting	contemplative
	ashamed	nervous	suspicious	indecisive

		Answers - Adults			
P	jealous	**panicked**	arrogant	hateful	**M**
1	**playful**	comforting	irritated	bored	**M**
2	terrified	**upset**	arrogant	annoyed	**M**
3	joking	flustered	**desire**	convinced	**F**
4	joking	**insisting**	amused	relaxed	**M**
5	irritated	sarcastic	**worried**	friendly	**M**
6	aghast	**fantasizing**	impatient	alarmed	**F**
7	apologetic	friendly	**uneasy**	dispirited	**M**
8	**despondent**	relieved	shy	excited	**M**
9	annoyed	hostile	horrified	**preoccupied**	**F**
10	**cautious**	insisting	bored	aghast	**M**
11	terrified	amused	**regretful**	flirtatious	**M**
12	indifferent	embarrassed	**sceptical**	dispirited	**M**
13	decisive	**anticipating**	threatening	shy	**M**
14	irritated	disappointed	depressed	**accusing**	**M**
15	**contemplative**	flustered	encouraging	amused	**F**
16	irritated	**thoughtful**	encouraging	sympathetic	**M**
17	**doubtful**	affectionate	playful	aghast	**F**
18	**decisive**	amused	aghast	bored	**F**
19	arrogant	grateful	sarcastic	**tentative**	**F**
20	dominant	**friendly**	guilty	horrified	**M**
21	embarrassed	**fantasizing**	confused	panicked	**F**
22	**preoccupied**	grateful	insisting	imploring	**F**
23	contented	apologetic	**defiant**	curious	**M**
24	**pensive**	irritated	excited	hostile	**M**
25	panicked	incredulous	despondent	**interested**	**F**
26	alarmed	shy	**hostile**	anxious	**M**
27	joking	**cautious**	arrogant	reassuring	**F**
28	**interested**	joking	affectionate	contented	**F**
29	impatient	aghast	irritated	**reflective**	**F**
30	grateful	**flirtatious**	hostile	disappointed	**F**
31	ashamed	**confident**	joking	dispirited	**F**
32	**serious**	ashamed	bewildered	alarmed	**M**
33	embarrassed	guilty	fantasizing	**concerned**	**M**
34	aghast	baffled	**distrustful**	terrified	**F**
35	puzzled	**nervous**	insisting	contemplative	**F**
36	ashamed	nervous	**suspicious**	indecisive	**M**

Appendix C

Personal Reaction Inventory

Directions: The statements below concern your personal reactions to a number of different situations. No two statements are exactly alike, so consider each statement carefully before answering. If a statement is TRUE or MOSTLY TRUE as applied to you**, fill in** the T, and if the statement is FALSE or MOSTLY FALSE as applied to you, **fill in** the F.

(T) (F) 1. I find it hard to imitate the behavior of other people.

(T) (F) 2. At parties and social gatherings, I do not attempt to do or say things others will like.

(T) (F) 3. I can only argue for ideas that I already believe.

(T) (F) 4. I can make impromptu speeches even on topics about which I have almost no information.

(T) (F) 5. I guess I put on a show to impress or entertain others.

(T) (F) 6. I would probably make a good actor or actress.

(T) (F) 7. In a group of people, I am rarely the center of attention.

(T) (F) 8. In different situations and with different people, I often act like very different persons.

(T) (F) 9. I am not particularly good at making other people like me.

(T) (F) 10. I'm not always the person I appear to be.

(T) (F) 11. I would not change my opinion (or the way I do things) in order to please someone or win their favor.

(T) (F) 12. I have considered being an entertainer.

(T) (F) 13. I have never been good at games like charades or improvisational acting.

(T) (F) 14. I have trouble changing my behavior to suit different people and different situations.

(T) (F) 15. At a party, I let others keep the jokes and stories going.

(T) (F) 16. I feel a bit awkward in public and do not show up quite as well as I should.

(T) (F) 17. I can look anyone in the eye and tell a lie with a straight face (if for a right end).

(T) (F) 18. I may deceive people by being friendly when I really dislike them.

Appendix D

Using the following scale, please respond to each of the following statements as they apply to you. There are no correct or incorrect answers. Please respond to each statement honestly and do not omit any items.

1	2	3	4
definitely disagree	slightly disagree	slightly agree	definitely agree

Autism-Spectrum Quotient

1._____I prefer to do things with others than on my own.

2._____I prefer to do things the same way over and over again.

3._____If I try to imagine something, I find it very easy to create a picture in my mind.

4._____I frequently get so strongly absorbed in one thing that I lose sight of other things.

5._____I often notice small sounds that others do not.

6._____I usually notice car license plates or similar strings of information.

7._____Other people frequently tell me that what I've said is impolite, even though I think it is polite.

8._____When I'm reading a story, I can easily imagine what the characters might look like.

9._____I am fascinated by dates (i.e. calendar dates)

10._____In a social group, I can easily keep track of several different person's conversations.

11._____I find social situations easy.

12._____I tend to notice details that others do not.

13._____I would rather go to a library than a party.

14._____I find making up stories easy.

15._____I find myself drawn more strongly to people than to things.

16._____I tend to have very strong interests, which I get upset about if I can't pursue.

17._____I enjoy social chit-chat.

1	2	3	4
definitely disagree	slightly disagree	slightly agree	definitely agree

18._____When I talk, it isn't always easy for others to get a word in edgeways.

19._____I am fascinated by numbers.

20._____When I'm reading a story, I find it difficult to work out the characters' intentions.

21._____I don't particularly enjoy reading fiction.

22._____I find it hard to make new friends.

23._____I notice patterns in things all the time.

24._____I would rather go the theatre than a museum.

25._____It does not upset me if my daily routine is disturbed.

26._____I frequently find that I don't know how to keep a conversation going.

27._____I find it easy to "read between the lines" when someone is talking to me.

28._____I usually concentrate more on the whole picture, rather than on small details.

29._____I am not very good at remembering phone numbers.

30._____I don't usually notice small changes in a situation or a person's appearance.

31._____I know how to tell if someone listening to me is getting bored.

32._____I find it easy to do more than one thing at once.

33._____When I talk on the phone, I'm not sure when it's my turn to speak.

34._____I enjoy doing things spontaneously.

35._____I am often the last to understand the point of a joke.

36._____I find it easy to work out what someone is thinking or feeling just by looking at his or her face.

37._____If there is an interruption, I can switch back to what I was doing very quickly.

1	2	3	4
definitely disagree	slightly disagree	slightly agree	definitely agree

38._____I am good at social chit-chat.

39._____People often tell me that I keep going on and on about the same thing.

40._____When I was young, I used to enjoy playing games that involved pretending with other children.

41._____I like to collect information about categories of things (e.g. types of cars, types of birds, types of train, types of plants, etc.).

42._____I find it difficult to imagine what it would be like to be someone else.

43._____I like to plan my social activities I participate in carefully.

44._____I enjoy social occasions.

45._____I find it difficult to work out people's intentions.

46._____New situations make me anxious.

47._____I enjoy meeting new people.

48._____I am a good diplomat.

49._____I am not very good at remembering people's date of birth.

50._____I find it very easy to play games with children that involve pretending.

wireless communication works.