Autism within Investigative Interviews: Examining the Impact of Procedural Information on Stress Levels

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Abstract

Autism Spectrum Disorder (ASD) describes a developmental difference in neurological functions of the brain, which has significant impacts on individuals who live with this condition. Individuals with ASD often experience a high amount of stress due to their broad set of symptoms, including struggles with social interaction and communication, sensory anomalies, repetitive behaviours, and diverse degrees of intellect. These characteristics of ASD can lead to difficulties in investigative interviews, as those have a high-pressure, stressful nature and are most often designed with neurotypicals in mind. Consequently, investigative interviews can intensify symptoms of ASD, possibly leading to wrongful incrimination of autistics. Accordingly, a solution needs to be found that decreases stress levels in autistics during investigative interviews to circumvent adverse outcomes, such as autistic meltdowns and, in worse cases, incrimination due to false confessions. This study investigates if providing procedural information prior to investigative interviews can reduce stress levels in individuals with ASD during those interviews. A 2 (procedural information vs. no procedural information) x 2 (Neurotypicals vs. ASD) x 2 (pre-interview vs. post-interview) between-group experimental design was employed. In total, 43 participants (11 autistics and 32 neurotypicals) participated in the study, which involved a mock investigative interview and questionnaires about state stress levels. Depending on the group, individuals received either procedural information (N= 19) or a filler task (N= 24) before the interviews. No significant interaction effects were found in the repeated measures ANOVA, indicating no effect of procedural information on stress levels. Yet, the main effect of procedural information was significant, showing a significant difference between the two compared groups. This leaves important implications for future research, as the difference in stress levels cannot be explained by procedural information but must be due to another variable not included in this analysis. Consequently, further research needs to be conducted to explore which variable was responsible for the effect.

Keywords: *Autism Spectrum Disorder, Investigative Interviews, Stress, Procedural Information*

Introduction

In 1994, Andrew Mallard was sentenced to 20 years in jail for alleged man slaughter (Adam & Van Golde, 2019). After spending 12 years in prison, it was found that Mallard's imprisonment was due to his social vulnerability and the use of interrogation techniques leading to a false confession (ABC News, 2019). Mallard's case is just one of many describing the unjust situations individuals with social vulnerabilities face in investigative interviews.

Especially individuals with social vulnerabilities, such as Autism Spectrum Disorder (ASD), can struggle with, among other difficulties, social interaction and communication. These struggles can be interpreted as suspicious in investigative interviews, possibly leading to unjust consequences for the individuals (Bagnall et al., 2023). For example, Bagnall et al. (2023) stated that autistic individuals often face difficulties with episodic memory retrieval, possibly leading to incomplete and unstructured narratives in investigative interviews. This can result in statements which can be mistakenly interpreted as deceptive, likely placing a disadvantage on the autistic individual.

Additionally, specific interviewing techniques which can trigger a high-stress response in individuals with ASD constitute a further risk factor for negative interview outcomes, such as emotional stress, false confessions, and imprisonment. This study focuses on investigating the relationship between the perceived stress of individuals with ASD and investigative interviews, as well as how the perceived stress could possibly be reduced by offering a method which supports the interviewed individuals in preparing for investigative interviews. The aim is to use the information gained from this study to take a step towards the development of more inclusive methods for investigative interviews.

Autism Spectrum Disorder

To be able to understand the Autism Spectrum Disorder better and develop a fitting strategy on how to reduce individuals' stress, it needs to be determined what the key characteristics of this disorder are. Autism spectrum disorder is a lifelong neurodevelopmental disorder characterised by difficulties in social communication and interaction, sensory anomalies (e.g., sensitivities to sounds, lights, smells), repetitive behaviours (e.g., hand-flapping, having to repeat the same word over and over, complying to their strict routines), and diverse degrees of intellect (Lord et al., 2020). ASD is referred to as a spectrum as individuals with ASD have different abilities and needs, as well as present with individual

conditions and symptoms, highlighting the complexity and uniqueness of the disorder (WHO, 2023).

According to WHO (2023), numbers have been rising to 1 in 100 children having autism in 2023 worldwide, though numbers differ when comparing countries' prevalences to each other. The increase in measured prevalence over the years can be justified by higher community awareness, rising public health responses and progress in case diagnoses (Zeidan et al., 2022). As an example, it was found that the renewed diagnostic criteria for ASD contributed to a 20-fold increase in the published prevalences over a time span of the past 30 years (Mottron & Bodzok, 2020). ASD is often diagnosed in individuals when they are still young, as it is a developmental disorder which sets in at an early age (12 to 18 months), with developmental issues being often quickly noticed by the general practitioner or carer of the child (*When do children usually show symptoms of autism*, 2017). However, the disorder is sometimes diagnosed much later on in life (WHO, 2023). The reasons for this and the challenges autistics deal with will be discussed in the upcoming sections.

The fact that the disorder is referred to as a spectrum alone has many indications for individuals with autism. Rosswurm (2022) describes the problems with the spectrum with an example as the following: ASD can be compared to diabetes. Diabetes has two subtypes: diabetes type I and diabetes type II. Even though both types fall under the category of diabetes, they need different ways of management to deal with the condition. Some need only sports and the correct diet, whereas others require medication to manage their disease. While the different types of diabetes get accepted, and people believe it is only natural that the two different types get treated differently, individuals with ASD are still getting generalised as a unity (Rosswurm, 2022). This comparison highlights that ASD is a highly individual disorder. Still, there are challenges individuals with autism deal with and know to a certain extent.

To go more into the depth of challenges autistics deal with, it is crucial to examine the core characteristics of the disorder as well as the wide range of consequent challenges which are experienced. Autistic people may find things in their environment, such as bright lights, certain smells or noises, overwhelming, stressful or uncomfortable (Hodges et al., 2020). Furthermore, individuals with ASD may find it hard to communicate and interact with other people, understand how other individuals think and feel and take longer to understand information. Social events or unfamiliar situations can cause stress, anxiety and a feeling of being upset. Additionally, autistic people can do or think certain things over and over (Hodges et al., 2020). An example of this behaviour is hand-flapping or memorising certain facts over

and over. These characteristics only describe which problems people with autism face; however, it also needs to be investigated why individuals with autism experience these symptoms.

One point in question is Executive Functioning (EF), which is a generalising expression for neuropsychological courses of action that regulate physical, cognitive, and emotional self-control (Corbett et al., 2009). A study by Fernandez-Prieto et al. (2020) suggests that the level of executive functioning in individuals with autism mediates their sensory processing and behaviour. Compared to neurotypicals, individuals with ASD show significant differences/shortcomings in vigilance, response inhibition, cognitive flexibility/switching, and working memory (Corbett et al., 2009; Fernandez-Prieto et al., 2020; Johnston et al., 2019). Executive functions are often linked to altered sensorial-perceptual problems, maladaptive behaviour, and communication difficulties.

Another factor that contributes to the challenges individuals with autism face is their difference in Theory of Mind (ToM) compared to the one of neurotypicals (Bamicha & Drigas, 2022). ToM is the ability to comprehend other people's thoughts, beliefs, desires, and emotions. The ability to understand these mental states is pivotal for drawing conclusions about the actions of others and reflecting upon them (Bamicha & Drigas, 2022). In the frame of the ToM, the double empathy problem was suggested, which explains that based on differences in ToM, autistic individuals can relate better to other individuals with autism. In contrast, interactions between autistics and neurotypicals lead to more stress in individuals with autism and perceived misunderstandings between the two groups (Cheang et al., 2024). Differences in ToM consequently lead to difficulties in social interactions, for example in communication and intensify individual struggles (e.g., stress). Having clarified why individuals with autism deal with the mentioned symptoms, one needs to have a look at how they cope with them.

In order to fit into society, individuals with ASD developed strategies to come across as neurotypical (Radulski, 2022). One of these strategies is masking. Masking can be described as a survival instinct to adapt to neurotypicals' behaviours to fit into society and not be outed as different, which may help the individual avoid mistreatment, feel a sense of belonging and make friends in a specific situation. However, masking is a very exhausting and stressful state, as the individuals force themselves to come across as feeling comfortable even though they suppress their every need, which might help them deal with uncomfortable situations (Radulski, 2022). Moreover, a masking autistic can be perceived as neurotypical by

other individuals. This makes the individual with ASD even more vulnerable, as neurotypicals do not see the need to engage in inclusive behaviour because it is most probably thought that the masking individual is neurotypical as well (Schneid & Raz, 2020).

Instead of coping with symptoms by engaging in masking, some individuals with ASD may find themselves in situations which are of a more harmful nature. To illustrate how autistic behaviour can become a pitfall, autism needs to be linked to criminal behaviour. Even though one might assume that individuals with ASD are less prone to committing a crime because of their love of rules and systems, this is actually not the case (Cooper et al., 2022). A study by Yu et al. (2021) showed that autistics have similar representation rates in the Criminal Justice System as neurotypicals. When looking into the reasons why individuals with autism committed crimes, the reasons are often linked to the symptoms of ASD, for example, obsessive behaviours resulting in stalking. This suggests that when autistic individuals engage in criminal behaviour, it is most often influenced by the symptoms of their disorder (King & Murphy, 2014).

Investigative Interviews and Stress in Individuals with ASD

Understanding the disorder pattern in ASD is vital in various contexts, including Investigative Interviews (Bagnall et al., 2023). As described before, individuals with ASD are most often confronted with the Criminal Justice System because of the behaviour they exhibit, for example, stalking a person because of their special interests and obsessive tendencies. A consequence of this behaviour might be an investigative interview, in which the crime will be examined. Investigative Interviews are a highly effective strategy to secure information from interviewees. The main objective of investigative interviews is the receival of qualitative and quantitative information from the questioned individuals (Lamb et al., 1998). This information consequently ensures a better understanding of situations and aids in the solution of crimes (Vrij et al., 2014).

Because of the autistics vulnerability these interviews can be especially challenging for them as their vulnerability may place them at a disadvantage (Gudjonsson, 2010). Gillott and Standen (2007) suggest that individuals with ASD experience more stress due to unfamiliar occurrences regarding the factors of change, anticipation, sensory and personal contact, and rituals during interviews. These factors were identified as common sources of induced stress in adults with ASD (Gillott & Standen, 2007; Gudjonsson, 2010). As these factors are often apparent in investigative interviews, individuals with ASD are more likely to

be stressed, consequently influencing the dynamic in investigative interviews by giving less effective statements, potentially leading to harmful outcomes for the individual with ASD.

In addition, it is especially hard for police officers to interpret the autistic behaviour in these interviews. Due to the disorder's broad spectrum of symptoms and the from the norm deviating characteristics of the disorder, police officers might interpret the from the autistic person displayed behaviour as suspicious (Brennen & Magnussen, 2020; Lim et al., 2021). Behaviour which is expected in investigative interviews is possibly not the same behaviour individuals with ASD would display. As an example, it is stated that individuals with ASD have difficulties maintaining eye contact with other individuals, remembering all information of an event, and staying relaxed (Maras & Bowler, 2010). Studies suggested that interviewers interpret fidgeting, nervousness, tenseness, and provision of incomplete information as suspicious (DePaulo et al., 2003; Lee & Welker, 2008).

Furthermore, heightened stress levels can cause interviewees to experience a multitude of negative consequences, such as obsessive, repetitive behaviour (García-Villamisar & Rojahn, 2013), as well as physical symptoms such as pain, discomfort, nausea, headaches, and shaking (Cheak-Zamora & Odunleye, 2022). Next to that, mental consequences like feelings of anger and being overwhelmed, worry, irritation, sadness, and meltdowns can occur (Cheak-Zamora & Odunleye, 2022). These perceived symptoms only promote the stress reaction of autistics further, highlighting why interviewers are getting suspicious about behaviour displayed by autistics, possibly leading to negative consequences for the individual (Bagnall et al., 2023).

Inevitably, individuals with ASD are at higher risk of being incriminated by mistake (Bagnall et al., 2023). A study by Logos et al. (2021) sheds light on this issue by proposing the expectancy violations model as an explanation for the negative evaluation of the autistic's behaviour. It is suggested that individuals develop, based on societal norms, personal characteristics, and context, expectations for how other individuals should behave. When the expected behaviours do not occur, the observer gets aroused and shifts their focus from the interaction to the unexpected behaviour. The exhibited behaviour is then interpreted by the observer, leading to mainly negative evaluations. In their study, Logos et al. (2021) were able to confirm the working mechanism of this model, as the violation of expected behaviour triggers an arousal response in the observer, which leads to mainly guilty judgements and verdicts of the individual in question.

Interviewing techniques not only evoke more suspicion towards the interviewees but can also intensify interviewees' stress levels. As the majority of interviewing techniques are tailored to neurotypicals (Cridland, 2014; Snook et al., 2014), the needs of individuals with ASD are not met with these interviewing techniques. As a result, individuals with ASD are confronted with situations outside of their comfort zone, leading to higher stress levels in the individuals, which furthermore alter the reliability of given information (Bagnall et al., 2023). This lack of adaption of interviewing techniques can affect the communication style during the investigative interviews, further heightening the stress and discomfort experienced. Finally, the maladaptation facilitates misunderstandings between both parties, misinterpretations of behaviour, and ultimately can lead to unfair conclusions about the interviewee's credibility and intentions, possibly leading to unjust victimization (Bagnall., 2023; Cridland, 2014).

In order to conduct a successful investigative interview, many countries adopted a rapport-based humane approach instead of coercive interrogation techniques, as these showed to have higher false incrimination rates (Bull & Rachlew, 2020). Brimbal et al. (2021) describe the rapport-based humane approach as using techniques such as productive questioning, conversational rapport and relational rapport-building to increase feelings of rapport, trust, cooperation, and information disclosure. By engaging in these humane approaches, investigative interviews have been conducted in the most effective way up until now.

An example of such a humane approach is the PEACE Model, which is an acronym for its entailed phases: Preparation and Planning, Engage and Explain, Account, Closure, and Evaluation (Snook et al., 2014). The PEACE Model is one of the most used interview strategies with vulnerable individuals in mind at the current time (Akca et al., 2021). The model focuses on the acquisition of truthful information with building rapport between the investigator and interviewee as one of the main objectives, aiding in the revelation of details. Studies have shown that the PEACE Model is not only the most effective at giving rise to information but also at hindering interviewees from being pressured into making false confessions (Akca et al., 2021). Considering these important characteristics of the PEACE Model, one understands that the aim of this model is to focus on obtaining the best evidence from the interviewees.

This standard procedure of the PEACE Model is highly effective as an interview technique for vulnerable interviewees (Snook et al., 2014). Yet, the PEACE Model only

provides a guideline to the interviewer on how to deal with interviewees. However, when needing to interview an individual with Autism Spectrum Disorder, these guidelines might be too loose to ensure the least amount of stress as possible, leaving a detrimental gap in research which needs to be closed (Snook et al., 2014). Therefore, other interviewing techniques need to be analysed to develop a more inclusive and stress-reducing interviewing technique for investigative interviews.

A different approach to receiving the best evidence in investigative interviews is the Witness-Aimed First Account (WAFA) Model. This model was designed especially for individuals with autism in mind, by supporting the individual's memory through motivating interviewees to choose and focus on self-defined event topics (Maras et al., 2020). Later on, these topics are of use when interviewees are asked to freely recall information within those topics. The study by Maras et al. (2020) elicited that employing the WAFA model helped autistics and neurotypicals recall more detailed and accurate information.

As positive an impact these two models have, they are both part of the rare current research practices which are employed to interview autistic individuals (Tesfaye et al., 2022). Furthermore, they are both evidence-focused and do not take into account the interviewees emotional constitution. This shows the lack of research which is being conducted to support individuals with ASD and designing a more inclusive alternative for autistics, especially those who struggle with stress in investigative interviews. In order to minimize the stress reaction in individuals with ASD, a tool needs to be developed to help autistics navigate challenges in investigative interviews with more ease. With this study, I propose procedural information as a tool which could reduce stress levels of individuals with ASD throughout investigative interviews.

Procedural Information

Due to the individuality of the disorder, a medium needs to be found that is able to help individuals with ASD navigate stressful situations, such as investigative interviews, and henceforth increase the inclusiveness of such interviews.

A study from Eastwood et al. (2014) proposes that vulnerable individuals struggle with navigating interrogations because of their cognitive abilities. It is stated that vulnerable individuals are more prone to complying with police officers and internalising information suggested to them. Subsequently, vulnerable individuals are proven to be more prone to making false confessions and being incriminated. Therefore, Eastwood et al. (2014)

investigated the cause of the faulty incrimination and found that often individuals do not understand the situation correctly in which they find themselves, for example, comprehending their legal rights. Consequently, an intervention was developed that entailed standardised pre-interview information explaining the individuals' rights in easier, less complex, and lengthy language. This intervention was proven to increase the understandability of legal rights by 40%, showing how effective pre-interview information can be.

Based on the PEACE Model introduced earlier in this paper and the study by Eastwood et al. (2014), investigative interviews can be redesigned in order to make them more suitable and inclusive to individuals with ASD. One of the phases can especially be of help here. In the Engage and Explain phase, the interviewer is able to go more into depth of the content of the interview. Ground rules and general information, such as what can be expected during the interview, can be shared with the interviewee. Being aware of what will happen can ease the interviewee and resolve the uncertainty of Investigative Interviews, making this challenging experience less stressful.

The findings of Bray et al. (2019), investigating possible effects of pre-procedural information on children's attitudes towards medical procedures, have shown that the receival of procedural information could help reduce children's stress levels before undergoing a medical procedure. In interviews with the children and their parents, it was found that children who did not get any information before the procedure dealt with more uncertainty about what would await them. Some children indicated that they thought the procedure would be worse than it actually was and mentioned that pre-procedural information would have helped them to feel less scared and worried and more in control of things. These findings highlight the necessity of investigating the effect of procedural information on the stress levels of individuals with ASD in investigative interviews, as these findings could have important implications for the well-being of autistics throughout investigative interviews and the effectiveness of investigative interviews.

The Present Study

As society is becoming more aware of the problematics and characteristics of ASD, it can be expected that more attention is put towards diagnosing individuals who show symptoms of the disorder. Consequently, the number of existing diagnoses is rising compared to the number of diagnoses existing years back (Lyall et al., 2017; North et al., 2008; Rice et al., 2012), emphasising the necessity for further research into the existing knowledge gaps which need to be filled. Consequently, this present study aims to test the effect of procedural

information on the perception of stress of individuals with ASD and neurotypical individuals in the setting of an investigative interview. This study will be conducted with neurotypicals and individuals with autism as participants, acting as a starting point/ building block for future research.

Accordingly, this research question is posed: To what extent do procedural information reduce stress levels in individuals?

Based on the PEACE model and the included engage and explain phase, the procedural information was designed, which will be provided before the investigative interviews are conducted. As stress in interviews is often produced by the uncertainty which the interviewee will be facing during the interview, it is hypothesised that procedural information given to individuals before the interview will reduce the interviewees' stress levels during the interview (H1).

To conclude, this research aims to further investigate the relationship between autism spectrum disorder (ASD) and investigative interviews. More precisely, the effect of procedural information will be measured on the perception of stress in individuals with ASD and neurotypicals.

Methods

Design

For the study, a 2 (procedural information vs. no procedural information) x 2 (Neurotypicals vs. ASD) x 2 (pre-interview vs. post-interview) between-group experimental design was utilised. In consequence, the independent variables were time and procedural information, and the dependent variable was stress level.

Participants

In total, 44 observations were obtained during the data collection, with 69.77% being female (*M*age = 21.3, *SD* = 2.06) and 30,23% being male (*M*age = 23.0, *SD* = 3.08). However, one of the participants was excluded from the dataset as they did not finish the study and only filled in 56% of the questionnaire, leaving a total of 43 participants. Of these 43 participants, 74.42 % of the sample were identified as neurotypicals after checking their ASD scores and reallocating five of the initial neurotypicals to the individuals with autism. Participants were allocated to the autism group if they had an ASD score of 26 or above. Hence, 25.58 % were identified as individuals with autism. The 43 participants were divided over two groups in a

semi-randomised manner. The division was regulated through the change of the conditions for each interview day. The procedural information group consequently had 20 participants, and the no-procedural information group had 23 participants. Regarding the nationality of the participants, it can be stated that the majority was German (N = 16), followed by Dutch participants (N = 13). Fourteen participants were from diverse backgrounds, with these nationalities as examples: Latvian, Greek, Colombian, Ukrainian, French American, and Egyptian.

Recruitment was conducted by convenience and snowball sampling via social media platforms, as well as Sona Systems, for which students from the University of Twente obtained compensation by earning one Sona Point. Furthermore, Autism Help Centres in the region of Twente were contacted to ask if their clients would be interest in joining the study. The participants were informed about the inclusion criteria and main objective of the study by an invitation mail. The inclusion criteria for the study were that participants needed to be at least 18 years old and proficient in English.

The study was approved by the BMS Ethics Committee of the University of Twente, documented under the ethical approval number 240141.

Materials and Procedure

The information given in the description of the study was limited to ensure the participants were unbiased during the study. On the day of the chosen timeslots, participants were informed about the whereabouts of the study. The study was conducted in one of the rooms from the BMS lab at the University of Twente and project rooms in the Horst building on the campus of the University of Twente. The collected data was gained from a web-based, anonymous self-report questionnaire set up in the Qualtrics Survey Software, which the participants completed on a laptop provided by the researchers. In order to fill out the questionnaire a stable internet connection was required. Participants gave informed consent in form of a digital flyer. When having agreed to participate in the study, the participants were forwarded to the questionnaires.

As this paper was part of a bigger study with multiple dependent variables being measured throughout the study set-up, it needs to be mentioned that participants were first presented with the Competitive State Anxiety-2 by Martens et al. (1990) before receiving the Perceived Stress Scale by Cohen et al. (1994; see Appendix A). However, the anxiety measurement was not taken into account for the present study.

After completing the Competitive State Anxiety-2 by Martens et al. (1990), participants received the Perceived Stress Scale by Cohen et al. (1994). The PSS-10 consists of ten items measured on a five-point Likert Scale (0= Never to 4= Very often). A higher score on the whole scale states higher perceived stress. The items from the Perceived Stress Scale (Cohen et al., 1994) were adapted so that the items were referring to the timespan before the interview (Pre- PSS-10) and after the interview (Post-PSS-10) and not to the past last month as in the original questionnaire. Examples of the items are the following: "How often have you been upset because of something that happened unexpectedly?", "How often have you felt nervous and "stressed"?" and “How often have you felt that you were on top of things?". The scale has a Cronbach’s Alpha value of 0.82, signifying satisfactory reliability of the scale (Andreou et al., 2011).

Having completed the stress measurement, participants were forwarded to a case vignette. The by Weiher (2020) created case vignette (see Appendix B) entailed pictures, which ensured that participants could immerse themselves into the situation and additionally had something to talk about in the interview. It entailed a story outline of a holiday spent in Madrid with a friend. At the end of the case vignette, the participants were prompted to pack their bag, which was provided on the table next to the laptop. Participants were able to choose from different items they could pack in the bag, like a towel, a t-shirt, sunscreen, sunglasses, a book, a cap, and slides (see Appendix C).

After packing their bag, participants were assigned to one of two conditions, using sequential allocation. The difference between the two conditions was that one condition entailed the receival of procedural information created by Weiher (2022; see Appendix D), informing about the investigative interview, what the participant can expect throughout that interview, and what the participants rights are in the interview. The control condition had a filler task (Appendix E) instead of procedural information, consisting of an article about a movie which needed to be read. Interviewees were not briefed about having committed a crime or not before starting the interview.

The first researcher then left the room, and the second researcher, acting as the police officer, entered the room, stating that this was a random border control and that the interview would be audio recorded.

The recorder was started, and the rights of the participants were read to them. Then, the researcher asked the questions from the structured interview guide (see Appendix F) created by Weiher (2020). The structured interview guide provides the interviewer with the right

sequence of the to be asked questions, as well as ensures that each interview is the same for each participant. Furthermore, the interview guide is based on a funnel structure, opening with broad questions at the beginning: "Please tell me in as much detail as possible what you have packed in your bag!" and closing with more specific questions: "Is this your bag?".

After having asked all the questions, the police officer requested to search the bag and proceeded to do so. Afterwards, the police officer left the room, and the second researcher came in to start up the remaining questionnaires, namely the questions about a strategy, the Rapport Scales for Investigative Interviews and Interrogations by Duke et al. (2018), and again the anxiety measurement and stress-scale and lastly the ASD scale (see Appendix G). The ASD scale was only completed by participants who indicated that they do not have an official ASD diagnosis. The ASD scale is implemented to filter out undiagnosed autistics and add them to the ASD group.

The Autism Spectrum Quotient (Baron-Cohen et al., 2001) consists of 50 items on a four-point Likert Scale, giving four choices for each statement: Definitely agree, Slightly agree, Slightly disagree, and Definitely disagree. Hereby, it needs to be noted that the agree and disagree statements need to be treated as a binary choice, as the statements will only be scored 0 or 1. The questionnaire is used to identify where on the spectrum a person finds themselves, ranging from autism to neurotypicality. A threshold score of 26 and above indicates possible autism. Examples of the items are the following: "I am fascinated by dates.", "I don't particularly enjoy reading fiction." and "I am not very good at remembering people's date of birth". The scales Cronbach's Alpha value ranges from 0.75 to 0.84, depending on the characteristics of samples, signifying satisfactory reliability of the scale (Broadbent et al., 2013). Having finished the questionnaires, the participants were debriefed about the real purpose of the study.

Analysis

For the 2x2x2 experimental design, an Analysis of Variance (ANOVA) will be used to analyse the data regarding the between-subject design. An alpha of $p = 0.05$ has been decided to investigate the differences between the groups.

First, the data is reviewed to identify any participants who did not meet the inclusion criteria. Furthermore, participants who did not fully complete the study (100%) are excluded from the data analysis.

After cleaning the data from NA's, descriptive statistics are used to get an overview of how long the interviews took and how the different experimental groups differed. The mean, standard deviation, minimum, and maximum for each condition were calculated. After that, the data is assessed for adherence to the assumptions of linearity, independence of observations, normality, and homogeneity of variances. If significant results are found by the assumption check, the data will be adjusted in order to meet the assumptions. If it is not feasible to make adjustments, the limitations will be addressed in the discussion.

A repeated measures ANOVA will be conducted to determine whether there are significant differences in the group means between the Procedural Information and No Procedural Information group. If the ANOVA will bring forward a significant result, post-hoc analysis will be conducted.

Results

Descriptive Statistics

The mean length of all conducted interviews was 4 minutes and 18 seconds *(SD* = 0.96, *Min* = 3 minutes 11 seconds, *Max* = 6 minutes 50 seconds*)*. The group "procedural information" had a mean duration of 4 minutes and 46 seconds (*SD* = 0.86, *Min* = 3 minutes 56 seconds, Max = 6 minutes 50 seconds), whereas the group "no procedural information" had a mean duration of 3 minutes and 51 seconds (*SD* = 0.83, *Min* = 3 minutes 11 seconds, *Max* = 5 minutes 20 seconds).

Mean pre- and post-stress levels were calculated together with their respective standard deviations for the four experimental groups (see Table 1). Comparing the stress levels of the two neurotypical groups with the two groups including the individuals with autism, it becomes clear that stress levels are generally lower in the neurotypical groups than in the groups including individuals with autism. Furthermore, it is visible that pre-stress levels are lower in the groups with neurotypicals and higher or unchanged in groups including the individuals with autism.

Table 1

Overview Means of Pre- and Post-Stress Levels for all four conditions

Group	Pre-Stress Level Mean	Pre-Stress SD	Post-Stress Level Mean	Post-Stress SD

NP (Neurotypical + Procedural Information)	17.0	4.9	15.3	6.4
NNP (Neurotypical + No Procedural Information)	20.2	5.1	18.8	6.5
AP (Autism + Procedural Information)	18.8	3.8	21.4	8.3
ANP (Autism + No Procedural Information)	20.8	4.6	20.8	5.6

Test of Hypothesis 1 (H1)

The first hypothesis, which stated that there is a difference in the stress levels between the groups Procedural Information and No Procedural Information, was tested with a repeated measures ANOVA. Here, it needs to be mentioned that comparisons between the groups Autism and Neurotypical were also conducted. However, due to the low sample size of the Autism group, results cannot be interpreted because of the low expressiveness the sample size yields. Consequently, only the Procedural Information and No Procedural Information groups will be of interest. A statistical significance was examined for the main effect of Procedural Information, $F(1,76) = 4.622$, $p = .0348$, indicating that the groups (Procedural Information vs. No Procedural Information) differed significantly in stress levels. Furthermore, the main effect of NeuroAutism (Neurotypicals vs. Autism) was not significant, $F(1, 76) = 3.02$, $p = .0865$, as well as the main effect of Time (Pre vs. Post Stress Levels), $F(1,76) = 0.001$, $p = .9763$. Mean stress levels for the pre-measurement were 19.0 ($SD = 4.94$) and for the post-measurement 18.2 ($SD = 6.75$), without splitting participants into experimental groups.

Even though a main effect of Procedural Information was found, there were no significant interaction effects revealed in the analysis. The interaction between Procedural Information and NeuroAutism was not significant, $F(1, 76)$ 0.837, $p = .3630$. Similarly, the interaction between Procedural information and Time was not significant, $F(1,76) = 0.030$, $p = .8623$. This suggests that Procedural Information does not have an effect on stress levels in individuals. Lastly, the interaction between NeuroAutism and Time also did not yield significant results, $F(1,76) = 0.981$, $p = .3251$.

Discussion

This study aimed to investigate the effects of procedural information on stress levels during the investigative interview, focussing on individuals with Autism Spectrum Disorder compared to neurotypicals. It was expected that procedural information might clarify the processes in an investigative interview by giving information about, for example, the aim of the interview, the rules during the interview, and the rights interviewees have in the interview. Consequently, the posed research question was the following: To what extent does procedural information reduce stress levels in individuals? It was hypothesised that procedural information given to individuals before the interview would reduce the interviewee's stress levels during the interview. However, based on the findings of this study, this hypothesis needs to be rejected.

Even though a significant main effect of Procedural Information was found, meaning that a significant difference between the analysed group means of Procedural Information and No Procedural Information exists, no interaction effect was found. This implies that there is a difference in means between stress levels in the groups Procedural Information and No Procedural Information. Nonetheless, these differences are not due to the chosen independent variables of Procedural Information and Autism. These findings reject H1 and contradict with the existing literature, which suggests that reducing uncertainty through clear, upfront information can mitigate stress (Bray et al., 2019).

As the study by Bray et al. (2019) suggested, providing procedural information could be effective in reducing stress levels by informing and explaining the procedure and, henceforth decreasing an individual's perceived uncertainty of the procedure. According to the participant’s statements, procedural information could be helpful in worrying less and perceiving less uncertainty about the procedure, consequently decreasing feelings of stress. Thus, these study insights were applied to the current study in which similar effects were expected to emerge. However, providing procedural information before investigative interviews showed to have no effect on reducing stress in individuals who received procedural information.

Possible reasons for the lack of an effect are that the study by Bray et al. (2019) was set in a different thematic study field and only entailed children being interviewed about their stress levels before the medical procedures. Hence, opinions about procedural information from young adults are missing, which could have been of relevance here. Moreover, the study by Bray et al. (2019) was an interview study that only provided information about the opinions of participants. Consequently, no effect of procedural information on stress levels

was actually tested in this study. While the present study could not confirm the hypotheses from the participants of the study conducted by Bray et al. (2019), the present study provided important insights into the lacking effect of procedural information on stress levels, which might be helpful to the research field of Bray et al. (2019), as well to the one from the present study.

Moreover, the results of this study contradict with the findings from Eastwood et al. (2014), who state that most of the interrogated individuals do not understand the given information, which places them at a higher risk of making a false confession and subsequently being incriminated, due to evoked high stress levels and perceived uncertainty. Eastwood et al. (2014) suggested that information given before police interrogations needs to be explained in a language which is suitable for the interviewee's mental capacity so that legal literacy would be increased and stress and uncertainty decreased. The study was tested on a sample of university students which yielded that the comprehension rate was elevated by 70% when receiving information in a language that is clear and reduced in complexity. These findings contradict the results of the present study, as no difference in stress levels between the Procedural Information group and the No Procedural Information group was found. This could be due to the differences in the samples used. The size of the present study sample might not have been large enough to be representative of the general population. Furthermore, the sample of the present study involved individuals with autism, which could have influenced the outcomes of the present study to be different to the outcomes of the study by Eastwood et al. (2014).

In line with previous research on the effect of procedural information from Lauber (2022) and Brieger (2022), one could have expected that procedural information has no effect on the perceived stress levels of individuals with autism. However, as both Lauber (2022) and Brieger (2022) researched the effects in a neurotypical sample with seven individuals being neurodiverse, one could have expected that results from the present study would be different. This could have been due to more specificity of the ASD disorder and a slightly bigger sample size. Yet, as the size of the sample is still not sufficiently big enough, one could think that the lack of a significant effect of procedural information might have been due to the small sample size.

Even though the ANOVA did not yield significant results on the effect of procedural information on the stress levels of individuals with autism and neurotypicals, differences in mean stress levels could be observed in the descriptive statistics, which could give an

indication for future research. Generally, stress levels of neurotypicals were lower than stress levels in individuals with ASD. This is in line with the study from Gillot and Standen (2007). Gillot and Standen (2007) described that individuals with ASD often display higher stress levels than neurotypicals in stressful situations. It was stated that this is due to the factors of change, anticipation, sensory and personal contact, and rituals during interviews. As the investigative interview conducted in this study at least covered factors of change (e.g. suddenly being interviewed by a different person) and sensory and personal contact (e.g. close personal contact with the researcher and police officer), the interview evoked more stress in the autistic groups than the neurotypical ones.

To identify why no statistically significant results were obtained, one should consider the following factors. First of all, Gillot & Standen (2007) used a different stress questionnaire, namely the Stress Schedule Survey (Groden et al., 2001), which was specifically designed for individuals with autism. Henceforth, they measured the stress from individuals with autism more precisely than the PSS scale from Cohen et al. (1994) would. Therefore, one should reconsider the usage of the PSS scale when more precise measurements for autistic individuals exist.

Measurement sensitivity is another factor that could explain why no differences in groups' stress levels were found over time. Perhaps the Perceived Stress Scale from Cohen et al. (1994) is not sensitive enough to reveal significant differences between the groups. However, the scale is also a subjective measure, meaning that the presented items in that questionnaire are very open to interpretation from individuals, possibly leading to measurement errors. Therefore, it is suggested that the study should be repeated by using other measurements, such as biometric ones, like heart rate monitoring or saliva cortisol level measurements (Dhama et al., 2019). This could enhance the measurement accuracy of stress levels and consequently improve the reliability of these measures (Giannakakis et al., 2022).

All in all, these results of the present study highlight the lacking effect of procedural information on stress levels, leaving implications for future studies and change in interview methods.

As unsignificant interaction effects of procedural information on stress levels were obtained, one questions why a main effect of procedural information on stress levels was found. A simple explanation for this outcome is that the differences in stress levels were evoked by variables which were not included in the analysis. This leaves space for speculation

and calls for further research on which variables could have an effect on stress levels of individuals.

Despite the unsignificant findings for H1, it remains crucial to consider individual differences in stress responses. The non-significant results may be due to the variability within the ASD group, reflecting the spectrum nature of the disorder (Lord et al., 2020). Future research should explore more tailored approaches to support individuals with ASD during investigative interviews, considering their unique needs and stress responses.

Strength, Limitations and Future Directions

Conducting the study in a laboratory setting allowed for control over various extraneous variables. However, the unnatural environment might not capture the external reliability of real investigative interviews, for example, the pressure invoked in such a situation, as well as the credibility of the authority figure of a police officer. Future studies should consider a study set-up which is closer to real investigative interviews, enhancing the generalisability of the findings onto the real world. In addition to that, the study was conducted in different rooms, which might have impacted the study outcome, as different environments can have an influence on, for example, the concentration and distraction of participants. Having consistency in the environment of the study set-up is essential for reducing external variability and assuring that observed effects are due to the experimental manipulation and not environmental differences.

Moreover, while this study laid its focus on interviewees' stress levels, it is crucial to consider the role of police officers. Implementing additional training for police officers on how to identify and interact with vulnerable groups could improve the outcomes of investigative interviews. This training could include understanding the unique needs and behaviours of individuals with ASD and adopting communication strategies that minimise perceived stress in the target group.

Talking about the interviewer, another point of discussion comes up, namely the gender of the interviewers in this study. As this study was solely conducted by female researchers, one might want to consider the gender dynamics in the investigative interview. Interviewees can perceive different genders diversely, possibly leading to altered stress levels. A study by Alhojailan (2020) showed that when the interviewer and interviewee are of the same gender, the interviewee is likely to share more information and report lengthier statements about related topics. In contrast, when the interviewer and interviewee are of

different genders, interviewees tend to respond scarcely and avoidantly (Alhojailan, 2020). Therefore, future studies should include interviewers of different genders to examine their potential effects.

Another point for discussion is the procedural information. First of all, it could have been that the information given on the procedural information flyer was not extensive or comprehensible enough to have an effect on the stress levels of individuals with ASD. This could explain the high and unchanged post-stress levels of autistic individuals in this study. Secondly, the procedural information was presented to the participants, yet it was not checked if the participants actually read the information. Therefore, the procedural information flyer could not even have an effect on participants' stress levels if it was not read. Thus, future studies should adapt the procedural information flyer more to the needs of individuals with ASD to ensure that those needs are met and that stress levels can be lowered. In addition, it should be checked if the procedural information is actually read by the participants. For example, a multiple-choice question could be posed after the procedural information, where participants need to indicate what the procedural information was about. Hence, procedural information needs to be read by participants to be included in the study and to make sure that procedural information could show an effect on the stress levels of the participants.

As ASD shares similar symptoms with, for example, Anxiety Disorders, comorbidities and symptoms should have been considered in the ASD- “diagnosing” part of neurotypicals in this study. Overlap of symptoms makes it difficult to differentiate between ASD and other neurodiverse conditions. Hence, future research should carefully acknowledge these comorbidities when “diagnosing” and categorising participants to account for accurate representation and interpretation of stress levels.

Another point which should be acknowledged is the sample size, particularly within the ASD group. The, in comparison to the neurotypical participant number, little participation rate of individuals with ASD, may has limited the power to detect significant differences. The sample size was already quite small (N= 43), however when taking into account the sample sizes in each group, it is obvious that those are too small to give a representative estimation of the different groups (N Neurotypical No Procedural Information = 17, N Neurotypical Procedural Information = 15, N Autistic No Procedural Information = 6, N Autistic Procedural Information = 5). Additionally, the study relied on self-reported stress measures, which may be influenced by subjective biases. Future research should incorporate

physiological measures of stress, such as heart rate variability, to provide a more reliable assessment of individual stress levels.

Moreover, as this study was not able to find significant effects of procedural information on stress levels, it is important to investigate other supportive measures, such as sensory accommodations or the presence of support persons, which may alleviate stress for individuals with ASD. Given the complex nature of ASD, a multifaceted approach is likely necessary to create truly inclusive investigative interview practices. First of all, an establishment of a multi-professional approach in research is suggested to include as many relevant perspectives of stakeholders, such as social workers, psychotherapists and police officers, to develop a method for investigative interviewing which includes all needed points of view crucial for decreasing stress levels in interviewees. Secondly, I would advocate for a combined method of interventions for individuals with ASD in investigative interviews. This could potentially be beneficial in not only reducing levels of stress but also alleviating feelings of anxiety and nervousness in the interviewee, ensuring the best possible state for an autistic person to be interviewed.

Conclusion

This study tested if providing individuals with procedural information decreases stress levels in neurotypicals as well as individuals with ASD in investigative interviews. Whereas the conducted analysis yielded no significant results which could not confirm the stated hypothesis, interesting tendencies for future research were found.

Future research should consider employing a bigger sample of individuals with ASD to be able to make meaningful inferences from the to be found outcomes. Additionally, more studies should be conducted to investigate which variables influence stress levels throughout investigative interviews. Although the present study did not yield significant results, it highlights the need for adopting more inclusive interview strategies. By adopting more inclusive interview techniques, the criminal justice system can take significant steps towards fairer and more effective interactions with individuals with ASD, thereby reducing the risk of unjust incrimination and enhancing the overall quality of investigative interviews.

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Appendix A

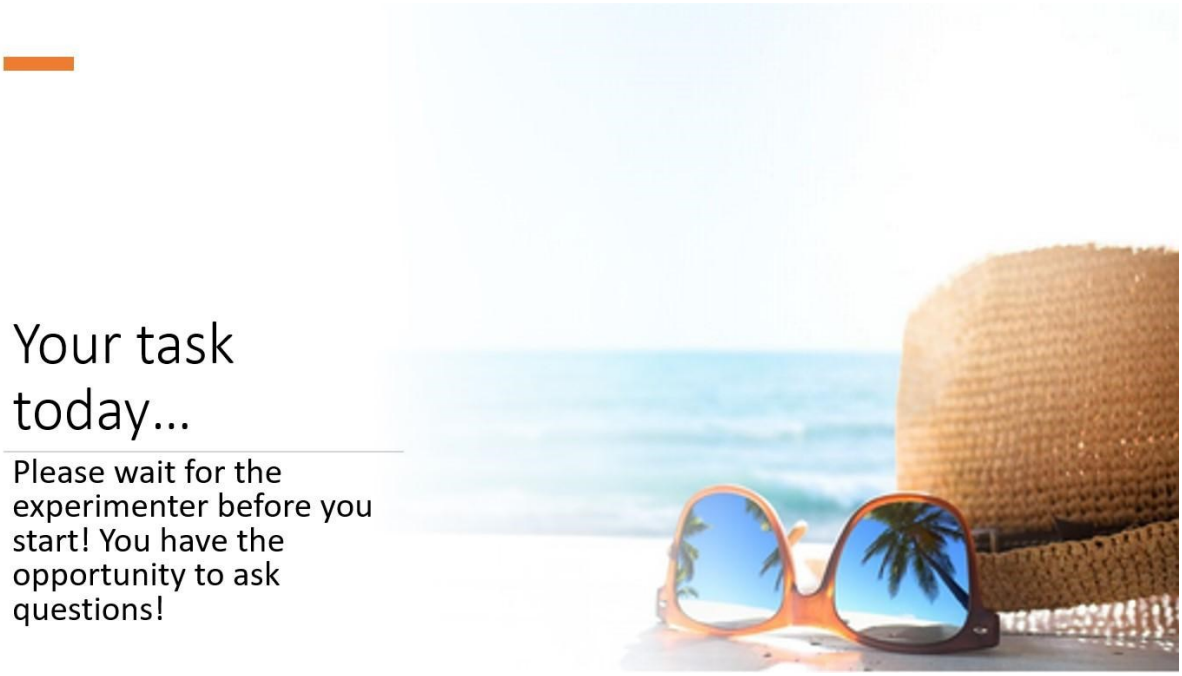
Perceived Stress Scale

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Appendix B

Case Vignette



You were traveling with your close friend, Anne Hastings (20), to Spain.

You were staying in a Hostel in Madrid and enjoyed 4 days together.

You spend most of your days in Madrid sightseeing...

Plaza de Cibeles

Puerta del Sol

Gran Via

Prado Museum

… and trying local food and bars.

… and trying local food and bars.

Now you are on your way back, alone, as Anne took an earlier flight to Tenerife, Canary Islands, yesterday to visit her grandparents who are there on an 8 weeks winter break.

Your last day in Madrid, you spent alone wandering through town and visiting the local markets.

You stop at your favourite pastry shop for a treat.

Back in the hostel, you meet Christian, Marco and Sofie, who you made friends with over the last couple of days.

They are on their way to an Escape Room and ask you if you would like to join.

Together you go to “Fox In A Box”.

After the escape game, you all go out for dinner.

After dinner, you pack your bag because next morning you are flying back to Enschede via Schiphol Airport.

Appendix C

Materials for „Packing your Bag“– Task

Appendix D

Procedural Information Flyer

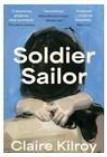
Appendix E

Filler Task

Biography
The Marriage Question
Clare Carlisle

History
Uproar!
Alice Loxton

Fiction
Nothing Special
Nicole Flattery



Fiction
Soldier Sailor
Claire Kilroy

If I Survive You Jonathan Escoffery

Dazzling debut of racial identity

The second-person point of view risks being contrived, distracting, presumptuous, scratchy, puerile and self-conscious. Just don't do it, writing instructors warn. Unless you're Escoffery, a young American in whose hands the second person is arresting, intimate, adventurous, attuned, sophisticated and, yes, still self-conscious.

Booker-shortlisted If I Survive You is a stylish debut of eight linked short stories set mostly in Miami during a recession. It advances in short, impressionistic scenes, and much like viewing a Seurat, you're lured in by the dazzling surface before needing to step back for relief. For the most part, the collection follows Trelawny, a racially ambiguous Black man, who is constantly served the question: "What are you?" His economic and romantic prospects are dim. He has no stable friendships. His family is a case study in marital estrangement, parental favouritism and sibling rivalry.

Obviously, the second person brokers empathy between reader and character - you put yourself in Trelawny's shoes. Less obviously, because you essentially stands in for I, it confirms the estrangement Trelawny feels from himself. He cannot convincingly narrate from the I position because that would presume that he inhabits a self. It's a genius move, when you consider it. Escoffery could have been content to tell these stories in a straightforward way - they're weighty enough to hold our attention - but his exaggerated stylishness takes us beyond wan empathy to identification.

Ian Williams

Appendix F

Interview Guide

1. you have the right to remain silent, anything you say can and will be used against you in the courts of law.
2. you have the right to an attourney ; you cannot afford one, one will be appointed.
3. did you understand everything ?

INTERVIEW

Before the interview to prepare participant for the interruption:

Experimenter:

"We will shortly begin the interview. Before we start I want you to now that we might need to interrupt the interview for a short while as my interviewer expects an important call. I apologies for this but I assure you this will not keep you longer with us than necessary. We just take a quick break, and then continue the interview."

"Engage and Explain"	"Accusatory"
Hello, I want to talk to you about your luggage. I need to establish whether you brought any illegal items to the Netherlands. This could have severe consequences such as a fine or even imprisonment depending on the item. But, let's talk first. Before we start I just want to go over some ground rules for today. For your protection and for mine I will record this so we get a full account of what was said today. The main purpose here is to get as much information as possible. So, it is important that you tell me everything in as much detail as possible without leaving things out. This is important because I wasn't there, so I don't know what happened. Do you have any questions so far? OK, so we'll begin the interview now.	
▪ Where did you travel from into the NL? ▪ What where you traveling for? ▪ Whom did you spend your holiday? ▪ Where is she now?	
▪ Where do you live in the NL? [Pointing at the bag.] ▪ Is this your bag? ▪ How many pieces of luggage do you have to be checked-in? ▪ Did you pack your luggage yourself or did somebody help you? ▪ Did you, at any point, leave your baggage unattended? ▪ Did anybody ask you to carry anything for them? ▪	
▪ Please tell me everything that you did since you packed your bag. ▪ Please tell me in as much detail as possible what you packed. ▪ Please tell me if there are any goods, you need to declare. ▪ What else can you tell me? ▪ Would it be okay for you if we check your bag? Thank you that is all I need to know for now.	

Appendix G

Autism Spectrum Quotient (AQ)

	Definitely Agree	Slightly Agree	Slightly Disagree	Definitely Disagree
1. I prefer to do things with others rather 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 when others do not.	○	○	○	○
6. I usually notice car number 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.	○	○	○	○
10. In a social group, I can easily keep track of several different people'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 to 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 chitchat.	○	○	○	○
18. When I talk, it isn't always easy for others to get a word in edgewise.	○	○	○	○
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 to the theater than to 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 the 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 their face.	○	○	○	○
37. If there is an interruption, I can switch back to what I was doing very quickly.	○	○	○	○
38. I am good at social chitchat.	○	○	○	○
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 involving pretending with other children.	○	○	○	○
41. I like to collect information about categories of things (e.g., types of cars, birds, trains, plants).	○	○	○	○
42. I find it difficult to imagine what it would be like to be someone else.	○	○	○	○
43. I like to carefully plan any activities I participate in.	○	○	○	○

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.	○	○	○	○