Examining the Effects of Prior Procedural Information on Measures of Anxiety in Autistic Individuals in the Investigative Interview

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Abstract

Investigative interviewing is crucial for gaining information from victims, witnesses and suspects. However, this technique has been constructed with neurotypical people in mind. The open-ended questioning style applied in these processes might not be helpful to people with Autism Spectrum Disorder (ASD). ASD is a neurological and developmental disorder that affects communication, behaviour and learning. People with ASD have higher levels of anxiety in day-to-day life, due to their challenges with sensory stimuli, the cognitive load and their need for routine (Van Steensel et al., 2014). Therefore, autistics might have different needs when it comes to an investigative interview. This research explores how providing prior procedural information before the investigative interview could decrease the autistic participants' anxiety levels during the investigative interview. A between-subject design with two conditions (receiving procedural information versus not receiving procedural information) was used. 42 participants in total conducted the interviews, which were followed by a questionnaire measuring somatic anxiety. 21 participants received prior procedural information, while the other 21 participants received no such information. There was a significant difference in anxiety levels before the mock interview and after the mock interview, with the anxiety levels of autistic participants having increased after the mock interview, both in the procedural information group (M = 2.00, SD = .99 before; M = 2.14, SD = 1.00 after) and the no procedural information group (M = 2.15, SD = 1.12 before; M = 2.30, SD = .98 after). Results however revealed that there was no significant difference in those who received prior procedural information (M = 2.14, SD =1.00) and those who did not (M = 2.30, SD = 0.98). These findings show that the provided procedural information did not effectively decrease anxiety in autistic individuals. However, there is a difference in anxiety levels in general after the mock interview between the no

procedural autistic group (M = 2.30, SD = .98) and the procedural information autistic group (M = 2.14, SD = 1.00), which shows that there is a tendency towards a decrease for anxiety. Future research should explore this tendency by enhancing the prior procedural information to be more tailored to autistic individuals to better support them in the investigative interview.

Examining the Effects of Prior Procedural Information on Measures of Anxiety in Autistic Individuals in the Investigative Interview

In 2023 an unnamed male autistic individual was persuaded into giving a false confession for a crime that he did not commit (Hill, 2023). Hill's article describes how her autistic son was persuaded into giving a false confession during police interviewing, which likely was due to his autistic traits, such as the tendency to follow the rules of authority figures. This real-life case emphasises that difficulties in communication, social deficits and otherwise characteristic traits of autism can make autistics more susceptible to false confessions when subjected to the investigative interviewing process. The article finishes by advocating for better techniques that can be used to interrogate suspects with autism.

Hill's case highlights the importance of investigative interviewing, a method of questioning witnesses, victims and suspects to gather valuable information for solving the crime or furthering the investigation (Vrij et al., 2014). Specifically, it highlights the fact that the method of investigative interviewing should be a method that works for everyone. This makes the investigative interview a crucial tool for solving a variety of cases. (Schollum, 2005). Therefore, the intended goal of an investigative interview is to uncover accurate and reliable information in order to understand the events of the alleged crime and to determine appropriate actions (*§ 11.01. Objectives of Police Questioning – Principles of the Law, Policing*, n.d.).

As an example of such a model used in interviewing, one can describe the Achieving Best Evidence in Criminal Proceedings: Guidance on Interviewing Victims and Witnesses, and Guidance on Using Special Measures (ABE approach). This approach was specifically designed with vulnerable witnesses, victims and suspects in mind (Ministry of Justice, 2022). The police officers who are trained in this approach are able to take the vulnerable witnesses' needs into account and are able to use special measures, such as communication aids, in order to help the witnesses with the interview. Additionally, the ABE model emphasises the presentation of interview ground rules to the interviewee before the interview starts. This is done in order to make the interviewee more comfortable by reducing their anxiety, which is caused by the fear of the uncertainty of the situation.

In this police interviewing model there are techniques mentioned that could be used for vulnerable witnesses, however there is a lack of mention of techniques that can be used when interviewing specifically autistic individuals, who might need special attention in order to ensure cooperation and low anxiety within the interview. What this means is that autistic people who make up a big portion of the general public, around 1:100, get left out of these techniques (Elias, 2022). This can have consequences for the justice system, as well as for the individuals themselves.

One such consequence of the models not properly taking autistic individuals into account is the fact that their anxiety levels can be elevated during the investigative interview. The heightened level of anxiety in autistic individuals could be due to multiple factors, such as the social demands of interviews, the unfamiliar and unpredictable environment of a police interview and the sensory issues that some autistic individuals might have. Elevated anxiety levels of autistic individuals can further impair their abilities to recall the event of the crime and therefore they are not able to provide detailed and accurate accounts of the event, which compromises the investigation (Bagnall et al., 2023).

Another consequence is that autistic people can be persuaded into false confessions more easily, or they can unknowingly incriminate themselves (Robins, 2022). A paper by Griego, Datzman, Estrada and Middlebrook (2019) looked at previous research which examined ASD in relation to suggestibility and false memories. Their results showed that autistic people have a higher rate of susceptibility toward false memories when compared to the norm.

Therefore, based on the prior consequences, it might be helpful to use a specific interview technique *before* the interview in order to mitigate the possible consequences that might develop *during* the interview. One such technique could be the provision of procedural information. Giving procedural information before the interview even starts may help autistic individuals, as it might put them at ease and it might give them a sense of predictability. Therefore, it might also decrease their anxiety, which can otherwise harm them.

That is why this paper investigates if prior procedural information before the interview might decrease the autistic interviewee's anxiety levels. In this research, prior procedural information consists of ground rules about their rights, the aim of the interview, how long it takes and other aspects that are important for an investigative interview (Appendix D).

Autism Spectrum Disorder in the investigative interview

Diagnosed autistics make up around 1% of the general world population (Elias, 2022) with the Netherlands in 5th place as the country with the most autistics in its population (Wisevoter, 2023). The numbers have changed drastically over the years, from 1 in 150 children in 2000 to 1 in 44 children in 2018 in the United States, for example (Wisevoter, 2023b). The increase in numbers is due to a few reasons, namely more awareness and screening, better diagnostic tools, broadened diagnostic criteria and reduced disparities in diagnosis (*CDC Newsroom*, 2016 & Ferguson, 2023).

ASD is a neurodevelopmental condition characterised by a diverse range of characteristics in the domains of social interaction, communication and behaviour. It encompasses a spectrum, which means that the presentation of ASD is different from person to person (*Autism Spectrum Disorder*, n.d.-b). This difference means that some autistic individuals might not have problems with verbal communication, while others might not verbally communicate at all. This spectrum reflects a range of struggles and strengths, rather than overall functioning (*Autism Spectrum Disorder*, n.d.). Difficulties in understanding social cues, wanting to adhere to their strict routines, a heightened cognitive load and sensory sensitivities are other characteristics of autistic people, which often lead to a high level of anxiety (Rudy, 2023; Normansell-Mossa et al., 2021; Sweller et al., 2019; Cunff et al., 2023; Strömberg et al., 2022).

These challenges mentioned above significantly influence the process of investigative interviewing, where high anxiety levels can have a negative effect on information recall and communication (Hope et al., 1990; Bagnall et al., 2023).

Research has shown that there is a negative relationship between anxiety levels and information disclosure, with higher levels of anxiety impeding the ability to recall information correctly or effectively communicate the relevant details (Hope et al., 1990). Therefore autistics having higher anxiety levels in investigative interviews are more likely to give less information (Bagnall et al., 2023).

Due to their anxiety, autistics may face more obstacles, such as not being able to talk properly, going blank, or even having a meltdown or shutting down (*Autism Spectrum Disorder*, n.d.). An autistic meltdown is characterised by a loss of behavioural control, where the individual might cry, shout or even self-injure. It is important to emphasise that this is not a deliberate act, rather it is out of control of the autistic individual. A meltdown is a probable outcome of sensory overload or anxiety. Conversely to a meltdown, a shutdown is another type of response to overwhelming situations, anxiety or sensory overload. It involves the autistic individual withdrawing or reducing responsiveness (*Autism Spectrum Disorder*, n.d.). What this means is that the autistic individual might become non-verbal or minimally responsive as a coping mechanism (Phung et al., 2021). This verbal and non-verbal language may be interpreted as guilty, a lack of remorse or even lying (Maras et al., 2015).

Most autistics also have difficulties in social settings, because they can struggle with understanding abstract concepts or have difficulty answering open questions, so they require more specific and focused questions (Bagnall et al., 2023). A key characteristic of most investigative interviewing methods is the use of open ended questions, since it allows for the interviewee to give their own recollection of what has happened without being led on by the interviewers (Rose, 2021). Therefore, this standardised approach to interviewing can be challenging for autistics, who may find it difficult to answer open ended questions.

And finally, sudden changes of plans can heighten the anxiety levels of autistic individuals. These sudden changes can disrupt their sense of routine, making it even more difficult for them to take part in something like an investigative interview. As previously mentioned, these aspects can make the investigative interview very difficult, as having to do an investigative interview is something that usually happens quite suddenly.

Therefore, in order to effectively gain information out of the investigative interview, those various negative challenges that autistic individuals face, such as their heightened level of anxiety, need to be properly addressed. One potential technique could be to provide prior procedural information to help mitigate these issues. By informing the autistic interviewee about what to expect during the interview, their anxiety might be reduced due to the fact that this information might help them navigate the unpredictable environment better. This preparation might therefore also help them with their anxiety.

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Current measures for interviewing autistics

At this moment in time, there is no agreed-upon method of investigative interviewing that can be used with autistics, besides the guidelines and tactics of the Witness Aimed First Account method (*What to Do When Conducting an Investigative Interview With an Autistic Person*, n.d.).

The Witness Aimed First Account (WAFA) is an interviewing method which provides suggestions on how to interview autistics to help them provide relevant information about events preceding the alleged crime.

WAFA suggests that autistics should try to give information by breaking it down into parts, which in turn helps them focus their memory recall into smaller chunks of information at a time (*What to Do When Conducting an Investigative Interview With an Autistic Person*, n.d.). This approach can reduce cognitive and social demands on the witness due to breaking down the event into more manageable chunks. Research has shown that WAFA interviews result in more detailed and accurate recall from both autistic and neurotypical witnesses, compared to standard police interviewing techniques (Maras et al., 2020).

Routine and predictability are crucial for autistics because deviations from their routine or new situations can cause significant anxiety. This anxiety is furthermore exacerbated in uncertain environments, such as police interviews, which are inherently unpredictable. Sensory sensitivity to unpredictable stimuli such as lighting, noise or smells can be further distressing, which can make it even more difficult for an autistic person to concentrate during the interview (What to Do When Conducting an Investigative Interview With an Autistic Person, n.d.).WAFA suggests taking those factors into account when interviewing an autistic individual and adjusting the interview environment accordingly. However, this method does not take into account measures of anxiety while interviewing an autistic individual, nor has it been specifically designed for autistic individuals. Anxiety caused by lack of routine, unpredictability, social interactions and the stressful situation of police interviews can significantly impact an autistic individual's ability to correctly recall and communicate information. Research by Maras and colleagues (2015), indicates that police interviewing techniques are not accommodating enough for autistic individuals, which can lead to them having a harder time recalling an event, therefore giving the interviewee less necessary and crucial information. She could also show that standard police interviewing techniques do not work as well on autistics as they do on neurotypical people (Maras et al., 2015). These findings emphasise the importance of finding an interviewing technique which works for autistic individuals.

An aspect that is not yet incorporated into the WAFA method is the usage of prior procedural information. This provision of prior procedural information could help to establish a routine for the autistic individual, which could mitigate anxiety related to the uncertainty of the investigative interview. By clearly explaining the interview process and maintaining a predictable structure, police officers can help to reduce the anxiety of the autistic interviewee, which could therefore improve the outcome of the interview.

To conclude, it is important to address the various negative consequences on both interviewer and interviewee when conventional policing techniques are employed. Implementing a procedure, such as prior procedural information, that can take into account the need for routine, predictability and anxiety reduction can improve the quality of the interview and ensure a fair and even more effective process.

Prior procedural information

An option worth exploring could be the use of prior procedural information, to see whether that could help to alleviate the anxiety of autistic individuals. Providing information about how long the interview might take, what to expect, who will conduct the interview, the location and their legal rights might create a more predictable environment, which could therefore potentially reduce anxiety and improve interview outcomes (Maras et al., 2020).

Additionally, it gives them a clear structure which they can use to prepare themselves mentally, therefore also possibly decreasing their anxiety levels. Considering that the situation of a police interview evokes feelings of anxiety and nervousness in most individuals, it is particularly challenging for autistics, due to their sensitivity to sensory stimuli, difficulty with uncertainty and unpredictability and reliance on routine, as well as their difficulties with social communication. Therefore, the addition of prior procedural information might instil a sense of safety and security as well as (mental) preparedness in the autistic interviewees.

Furthermore, autistic individuals also have other difficulties, such as the sensitivity to sensory stimuli and the cognitive load, that could be decreased with the help of this prior procedural information; it could level the playing field between autistic and neurotypical people.

By giving them prior procedural information, they can already anticipate the potential sensory triggers that they might encounter during the interview, such as the lighting, the fact that there will be people talking (so the noise level) and other potential sensory aspects of the interview room, thereby reducing the likelihood of them getting overstimulated (Allenmark et al., 2020).

The procedural information can reduce the cognitive load that autistic individuals already have, and the prior procedural information helps to decrease the uncertainty of the interview, which makes the process more predictable and certain (Normansell-Mossa et al., 2021 & Riedelbauch et al., 2023).

Additionally, the fact that autistic individuals have a harder time in situations that are out of their routine, such as a police interview, increases their anxiety. This increase in anxiety can also lead to worse information recall (Hope et al., 1990). Therefore, by giving the autistic interviewer prior procedural information we hope to minimise these risks.

Past bachelor theses by Lauber and Brieger (2022) have tested the same technique of prior procedural information in their research study, however, their studies focussed more on neurodiversity in general instead of specifically on autism. Their results have shown that there is indeed a tendency for more information sharing, higher rapport and cooperation, and a decrease in anxiety levels for neurodiverse participants after having given prior procedural information. Therefore it might be interesting to test whether this technique of prior procedural information might have an influence on autistic individuals since they are a part of the neurodiverse sample that Lauber and Brieger researched in their studies.

To strengthen the point made above, other research has shown that providing information upfront reduces anxiety in autistics that may stem from unpredictability and change of routine (Maras & Centre for Applied Autism Research, n.d.).

Therefore, this research will test whether giving prior procedural information to a person with ASD prior to the interview will lead to a decreased level of anxiety than without being given the procedural information prior to the interview.

Goal of the study

Considering the gap in existing interview techniques for autistic people, this study aims to test whether the technique of providing an autistic interviewee prior to the interview with procedural information can decrease their anxiety. This technique will be tested on both neurotypical as well as autistic individuals.

The following research question has been compiled with the previously set goal in mind: Can prior procedural information help decrease the interviewees' anxiety levels? Furthermore, the research question has two associated hypotheses.

H1: Anxiety levels will be lower in the procedural information group compared to the no-procedural information group.

H2: Anxiety levels will be lower for the autistic people in the procedural information group compared to the autistic people in the no-procedural information group.

Regarding both hypotheses, it can be predicted that the understanding of the procedure of the investigative interview should be higher in the procedural information group compared to the no-procedural information group. This understanding of the procedure is therefore argued to reduce uncertainty before the interview, which then also leads to lower anxiety levels (Eastwood et al., 2014).

Methods

Design

A 2 (groups: neurotypical vs. autistic) x 2 (effect: prior procedural information vs control) between-subjects design was used. The groups were semi-randomly assigned to either the procedural information group or the no information group, but they were not divided into autistics and neurotypicals, as this was predetermined based on the characteristic of neurodiversity. Both neurotypicals and autistics will be tested on one dependent variable, namely anxiety.

Participants

The research was approved by the BMS Ethics Committee (reference #240141). Participants were mainly gathered through the SONA system of the University of Twente. The SONA system is a subject pool of the University of Twente where students can help each other in participating in studies. Students also receive credits for their participation, which is needed for graduation. The rest of the participants were gathered via word-of-mouth and via social media platforms such as WhatsApp, Discord and Instagram, as well as via an Autism Help Centre that we contacted via email.

In total, 53 participants volunteered for the study. After exclusion 42 participants were considered for further analysis. Exclusion reasons ranged from participants not fully filling out the survey to participants skipping certain questions and therefore leaving blank results. Of all participants, 12 were male (M = 23, SD = 3.08) and 30 were female (M = 21.3, SD = 2.05). 15 participants were of German nationality, with 12 being Dutch and the rest 15 were from other countries, such as Poland, Russia, Lithuania and Greece. Of those, five were officially diagnosed as autistic and 39 were not. Six participants were added to the autistic group due to them scoring high on the ASD questionnaire, with the cut off being 26 as prescribed by the AQ. Therefore we had a total of 11 autistics. 21 participants were in the no-procedural information group and 21 participants, five were in the prior procedural information group. From the total of 11 autistic participants, five were in the no-procedural information group.

Materials

Due to this research being part of a broader study, the measures done in this study consisted of a coding scheme for strategies, a rapport scale for interviews by Duke et al. (2018). a questionnaire measuring stress by Cohen et al. (1994) and the Autism Spectrum Quotient by Baron-Cohen (2001). However, only the Revised Competitive State Anxiety-2 questionnaire was included in the analysis.

It was a lab study and the questionnaires were provided via a laptop. Participants did not know about the exact procedure of the study, thus they did not know they had to fill out questionnaires and participate in an interview.

Participants fill in a pre-questionnaire before the mock interview, afterwards, they get the case vignette and then the mock interview with the border control officer, and a final post-questionnaire after the mock interview.

The mock interview consisted of a series of questions that the participants were asked. The interview was structured and was the same for each group (see Appendix E). Having a structured interview allowed for researchers to switch roles in terms of pretending to be the border control officer. Additionally, it also gives more consistency since all participants are asked the same questions and therefore it is also more efficient, as there was no need to improvise and so deviate from the established structure. The questions were open-ended and followed a funnel structure, with questions such as "Please tell me in as much detail what you did after you packed your bag" and the final question "Would it be okay if I checked your bag?". Each interview took approximately 5-10 minutes to complete.

Case Vignette

In order for the participants to have something to recall later on in the interview the research used a case vignette. The case vignette was designed by Weiher (2023) and presents a scenario about the participant going on a holiday (see Appendix B). The participants were instructed to imagine going on a holiday to Spain with a friend. They were provided with pictures of Spain, Spanish food and restaurants as well as information about their supposed friend and what exactly they did in Spain. Furthermore, after this information was given to the participants, they were asked to pack items into a big bag. They were told to imagine that these were their items as well as their bag that they took on their supposed holiday. Their belongings were items one would usually take on a holiday; sunscreen, a towel, a hat, sunglasses, slippers, a t-shirt and a book. The participants were not told to pretend that they had committed a crime. The participants are innocent in this case.

Depending on whether they were part of the no-procedural information group or the prior procedural information group, they either got a digital flyer with random information about a movie or the prior procedural information. Finally, they were instructed to imagine as if they were back in the Netherlands, going through border control with their bag.

Prior procedural information

Prior procedural information was provided to participants with information about the interview, including what they can expect and what their rights are. This information was provided digitally in the form of a flyer. It explains what a voluntary police interview is, what the aim is, that the participants are allowed to leave at any time once it has begun, that the conversation will be recorded and therefore anything that they say can and might be used against them in subsequent criminal proceedings. The flyer also shows the procedure of the interview in

three steps; before the interview, at the start of the interview, and during the interview. Before the interview it says that the participants are formally cautioned and informed of their legal rights as well as Miranda's Rights. At the start of the interview it says that the interviewer will tell the participant about all of the people involved, the purpose of the interview, that they do not have to say anything and if they do that it can be used against them, as well as that they can stop at any time. During the interview it says that the officer will ask questions which can cover issues such as their whereabouts during certain times, whether they know certain people and their knowledge of specific events. The flyer also mentions that the participant has a right to breaks, which are normally 15 minutes every two hours, if the interview goes on for that long.

Measures

The Competitive State Anxiety-2, or CSAI-2 for short, by Martens et al.. (1990) was used to measure anxiety at two time points, namely before the mock interview and after the mock interview with the border control officer. This scale has been developed to measure three facets of anxiety, namely somatic anxiety, cognitive anxiety and self-confidence. The reason this scale was chosen is because it has been widely validated and demonstrated to have good reliability according to Gabilondo et al. (2012). What this means is that the CSAI-2 produces stable and consistent results over time and in different contexts. The scale originally consists of 27 statements measured on a four-point Likert scale ranging from 1= "Not at all" and 4= "Very much so". Statements were, for example, "My hands are clammy" or "I feel my stomach sinking.". Due to time reasons and feasibility, only 13 statements were used in this study, and only compromising the facets of somatic anxiety. Higher scores on the scale mean higher anxiety levels in the participants.

The reliability of this scale was assessed using the Cronbach's alpha coefficient. Analysis revealed Cronbach's alpha of 0.85, which means that it had a high internal consistency. The average inter-item correlation was 0.34, which suggests a good correlation between the items. All in all, these results show that the questionnaire still demonstrates strong internal reliability and is therefore suitable for further analyses.

Additionally, the Autism Spectrum Quotient (AQ) by Baron-Cohen et al. (2001) was used to identify participants who might have autism but might not have a formal diagnosis yet. The scale consists of a 4-point Likert scale, ranging from 1= "Strongly Disagree" and 4= "Strongly agree". The questionnaire consists of 50 items, with statements about daily life, such as "I prefer to do things with others rather than on my own", "I prefer to do things the same way over and over again", and "I frequently get so strongly absorbed in one thing that I lost sight of others things". The cut-off score for participants to be added to the autistic group was 26. Research has shown that the AQ correctly scores autistics, that the test-retest reliability was found to be good as well as the inter-rater reliability (Van Rentergem et al., 2019).

Procedure

In order to hide the study's true purpose, the study was advertised as a study that examines human behaviour in situations involving information exchange and communication dynamics at border control. In general, the study consists of three parts, the pre-interview questionnaires, the mock interview and the post-interview questionnaires. The participants were sequentially assigned to one of two conditions (procedural information vs no-procedural information). In order to randomise the selection of which participant would be in which group, the conditions altered per day. This alternation of groups by day was not communicated to the participants. All participants received a debriefing after having finished the post-interview questionnaire and were allowed to ask questions in case they had questions.

Pre-interview questionnaire

The participants and the researcher met at the agreed time and agreed place, which varied from participant to participant. We tried to keep the place consistent between participants, however due to logistical difficulties we had to sometimes change rooms in between participants. For the time slots they were always the same, namely thirty minute intervals starting at 9 AM and the final time slot finishing at 5 PM. In total, that means we had 18 time slots per day. Participants could sign themselves up in the timeslot of their choice. This was the same for every weekday.

All participants first received the informed consent and then continued by answering the pre-questionnaires, which consist of the anxiety questionnaire (see Appendix A) and stress questionnaire. Afterwards, all participants get the case vignette (see Appendix B). The case vignette has information about their supposed holiday in Spain, as well as the task of packing their holiday bag.

Participants in the prior procedural group also received the same information, however they also received a digital flyer right after the case vignette containing the procedural information prior to the mock interview. The flyer includes legal rights and general information about the procedures of the mock interview (see Appendix D).

After the case vignette, and the prior procedural information depending on which group the participant is a part of, the participants have a short moment to ask any questions they may have. Then they are informed to pack their holiday bags. Afterwards they walk through border control, where one researcher plays the role of border control officer. This experience of walking through border control was simulated by the border control officer walking into the room that the participant was in, instead of the participant walking to another room, since we did not have access to two rooms.

Mock interview

The border control interview starts with the researcher, who is pretending to be a police officer, asking them questions about their holiday and bag. The interview was structured and was the same for each group. It includes questions such as "Where did you go on holiday?", "What did you do on holiday?" and "Did you pack your bag on your own?". The interview started broad and progressively delved into more specific questions about the bag. Finally, the officer asks to check the participant's bag and does so. Each interview took about 5 to 10 minutes, with the average time being 4 minutes and 18 seconds.

Post-interview questionnaires

After the interview the participants were instructed to answer the follow-up questionnaires, which were the anxiety scale, the rapport scale and the stress scale, in addition to asking whether they had a strategy going into the interview. Then followed the Autism Spectrum Quotient (see Appendix C), a standardised questionnaire which was used in order to identify individuals who might potentially exhibit traits of autism spectrum disorder, who however may not have received a formal diagnosis. If participants scored higher than the cut off point on the AQ, which is 26, they were added to the autistic group. Lastly participants were asked questions relating to their demographic background and it ended with a debrief section (see Appendix F) in which participants were informed about the real purpose of this research.

Results

Descriptive statistics

Before looking at the effect of prior procedural information, the overall statistics for the anxiety measure will be presented. Across all participants and conditions, the mean anxiety score was M = 2.26, with a standard deviation of SD = 1.01.

Time Interview

The mean duration for all the interviews was 4 minutes and 18 seconds (Min = 3 minutes 11 seconds, Max = 6 minutes 50 seconds). In the non-procedural information group the mean duration was 3 minutes and 51 seconds (Min = 3 minutes 11 seconds, Max = 5 minutes 20 seconds) and in the procedural information group 4 minutes and 46 seconds (Min = 3 minutes 56 seconds, Max = 6 minutes 50 seconds).

Hypothesis 1 & 2 (H1 & H2)

A factorial ANOVA was conducted to examine the effect of prior procedural information on pre and post measurements of both groups. The between-participants variable is procedural info, this variable indicates whether the participants have received prior procedural information or not. The within-participants variable is time, this variable has two levels (Pre and Post), which denote at which time the measurements of their anxiety levels were taken, so either before the mock interview or after the mock interview.

The main effect of prior procedural information was not significant, F(1, 8) = 2.461, p = 0.155. The mean score for both groups that received procedural information was M = 2.54 (SD = 1.25) before the mock interview and M = 2.61 (SD = .87) after the mock interview, while the mean score for those who did not receive procedural information was M = 2.12 (SD = .85) before the mock interview and M = 2.12 (SD = .90) after the mock interview. Additionally, the

interaction effect between pre and post measurements and prior procedural information was not significant either, F(1, 8) = 0.663, p = 0.439. This shows that the anxiety scores of both groups increased slightly in the prior procedural information group, while in the no information group it stayed the same.

Afterwards, a separate factorial ANOVA was conducted for the autistic group only. The main effect of the prior procedural information was not significant, F(1, 40) = 0.066, p = 0.799. However there was a significant difference between pre and post measurements of anxiety, F(1, 40) = 4.256, p = 0.046. The mean score for the autistic group that received procedural information was M = 2.00 (SD = .99) before the mock interview and M = 2.14 (SD = 1.00) after the mock interview. The mean score for the autistic group that had not received procedural information was M = 2.15 (SD = 1.12) before the mock interview and M = 2.30 (SD = .98) after the mock interview. What this means is that their anxiety actually increased after having received prior procedural information and also after not having received it. Although the interaction effect between pre and post measurements and prior procedural information was not significant, F(1, 40) = 0.879, p = 0.354.

Regarding the within-subjects effects, a factorial ANOVA was conducted to examine the effect of the interaction between pre and post measurements and prior procedural information (F(1, 38) = 0.858, p = 0.360) as well as pre and post measurements and ASD (F(1, 38) = 0.417, p = 0.522), and the three-way interaction between pre and post measurements, prior procedural information and ASD (F(1, 38) = 0.417, p = 0.522). None were significant.

Table 1

Statistics for procedural information and time on autistic participants, neurotypical participants, and both.

Time	Procedural Info	Neurot gro	typical oup	Autistic	e group	Both g	groups
		М	SD	М	SD	М	SD
Pre	Info	2.20	1.02	2.00	.99	2.54	1.25
Post	Info	2.16	1.04	2.14	1.00	2.61	.87
Pre	No Info	2.23	1.15	2.15	1.12	2.12	.86
Post	No Info	2.21	1.07	2.30	.98	2.12	.90

Note: M = Mean; SD = Standard Deviation. This table shows the anxiety levels of the groups before the interview, after the interview, and also depending on whether they have received prior procedural information or not.

Discussion

Main Findings

The primary goal of this study was to investigate the impact of prior procedural information on anxiety levels in autistic individuals during investigative interviews. Previous studies by Brieger (2022) and Lauber (2022), did not find significant outcomes for prior procedural information. However, in their studies there was a tendency for a difference in the procedural information group and particularly among neurodivergent participants. Again, they did only test the technique of prior procedural information on neurodivergent and neurotypical participants, however this tendency does give valuable information into what might benefit autistic individuals, as they did not specifically test on autistics. Therefore my research aimed to address this gap in their study by focusing on autistic participants specifically.

There was a significant difference between pre and post measurements of anxiety in the autistic group, showing that investigative interviews are indeed generally anxiety inducing for autistic individuals. Their anxiety scores actually increased after having received prior procedural information, as well as after they did not receive prior procedural information. Specifically, the mean anxiety score for participants who received procedural information was M = 2.00 (SD = .99) before the mock interview and M = 2.14 (SD = 1.00) after the mock interview. The mean score for the autistic group that had not received procedural information was M = 2.15 (SD = 1.12) before the mock interview and M = 2.30 (SD = .98) after the mock interview. This shows that the somatic anxiety in the autistic group has changed significantly from before the interview to after the interview, with and without prior procedural information. This confirms the prior statements of investigative interviews being an anxiety inducing method of information acquisition. However, this also suggests that prior procedural information, at least as provided in this study, was not effective in reducing anxiety levels in the autistic group.

It was hypothesised that the group which received prior procedural information prior to the interview would have decreased anxiety levels compared to the group which received no-procedural information. My findings suggest that there is no statistically significant difference between the two conditions, prior procedural information and no-procedural information. The anxiety scores in the neurotypical group did decrease, their mean score before the interview was M = 2.20 (SD = 1.02) and their mean score after the interview was M = 2.16 (SD = 1.04) when having been provided the prior procedural information, however this decrease was not significant. Conversely, the anxiety scores for autistic participants actually increased after having been given prior procedural information, namely from M = 2.00 (SD = .99) before the mock interview to M = 2.14 (SD = 1.00) after the mock interview.

This outcome suggests that receiving prior procedural information is not as beneficial as was hypothesised to be for the individuals in this specific study.

One possible explanation for these findings, or lack of significant findings, could be due to the nature of the investigative interviews in this study. In this study, the perceived threat might not have been high enough to simulate real anxiety levels that one might feel in a real life border control situation (Lox, 1992). The interview was conducted in a mock-style way, which means that we pretended to be border control officers without actual uniforms or an environment that mimicked an authentic border control setting. This lack of realism could have had the outcome that participants perceived the interview as less serious, which therefore might have reduced their overall anxiety (Edwards et al., 2014).

Another possible reason for this could be that the prior procedural information that was given to the autistic individuals was not adequate or clear enough to accommodate sensory needs, difficulties with change, or uncertainty (Autism Specialty Group, 2023; Normansell-Mossa et al., 2021). If the procedural information did not properly prepare the autistic individual for the change of routine, the sensory stimuli and the procedure of the interview then it might not have had a beneficial effect.

In this study specifically, the procedural information that was given to the participants was standardised and quite general, so it might not have been detailed enough for autistic individuals. For example, descriptions of sensory stimuli that might be experienced during the interviews were not mentioned in our prior procedural information, however that might be beneficial for future research.

Research by Pfeiffer et al., (2011) suggest that tailored interventions which take into account the unique sensory needs of autistic individuals are more effective. Therefore, allowing for sensory accommodations, such as a quiet room or dim lighting, might enhance the effectiveness of prior procedural information.

Future research could explore alternative ways to give procedural information to better address the needs and preferences of autistic individuals. For example, by giving tailored procedural information that is specifically designed to the needs of autistic individuals, by enhancing sensory accommodations such as quiet rooms and dim lighting, as well as having a more realistic scenario.

Limitations

Lack of realism

This study was limited in the fact that it was low stakes and it lacked realism in the mock-style interviews. In a real investigative setting, the consequences can be quite high, such as legal implications. However, in our mock interview the participants faced no consequences. Therefore, the perceived threat might not have been high enough in the mock interview to induce the same levels of anxiety that one might have in a real-life situation. Research by Young et al., (2004) found that mock interviews do increase anxiety, however they do not completely reflect the levels of anxiety that are experienced in a real-life interview. Although, we did try to make the interview as serious as possible, by implying that the interview might have repercussions, by recording the interview, having a bag with items that was supposed to be the luggage of the participant and roleplaying as a border control officer.

For future research, one could enhance the realism by implementing a physical environment that mimics that of a border control room, hire actors or actresses to play the role of the border control officer, and use props such as a passport to make it even more realistic.

Standardisation

Another limitation of this study is the process of conducting the investigative interviews. We did not have access to a room or lab that we could use for the interviews, so we had to improvise by booking rooms in different locations throughout the university through their booking system. This change in rooms also meant that we had a different environment for each participant, which could have influenced the outcome of the study, due to it not being standardised (Atlan, 2023). However, we did try to keep it as uniform as possible. This was done by having the study open the same time every weekday, from 9 AM to 5 PM, with thirty minute interval time slots. We also tried to book a room in the same building, so that the participants still had a similar environment, although not exactly the same. Another way we kept the study as standardised as possible was by using a structured guideline for the interviews. This way we made sure that even though the border control officer was played by a different researcher, we all used the same script.

For future research, one could perhaps choose to do virtual interviews instead of real life settings. This virtual interview provides all participants with the same standardised setting, regardless of physical location. However, there might be other limitations that might be introduced when opting to use virtual interviews.

An advantage of using a virtual interview would be that it provides a standardised setting for all participants, regardless of their location, which could therefore decrease environmental bias (Selvam et al., 2022). Another advantage is that by using virtual interviewing it is more accessible for people to participate in the study. This might be especially useful for a study like this where one needs a rare population, individuals with ASD, as one would have a greater pool of potential participants to work with (*The Role of Virtual Interviews in 2023*, n.d.).

However, a disadvantage of using virtual interviews could be the technological challenges that come with doing virtual interviews. Participants and researchers alike might have problems with internet connection, which can therefore disrupt the interview process and affect the data (Keister et al., 2022). Another disadvantage would be the limited use of the environment and props. As was mentioned earlier, using the environment and props can be a great way to enhance the experience and realism of the study. However, when doing an online interview, it would be very difficult to simulate a border control room along with its props. This might then reduce the realism of the interview, which harms the outcome of the study (Keister et al., 2022).

Besides the limitations that this study had, the innovative approach is something that positively stood out. Although previous research has explored various other techniques to improve interview outcomes, there is a noticeable gap in research when it comes to the provision of prior procedural information. Therefore, this study offers an unique insight into a technique that might be beneficial to people with autism spectrum disorder.

Statistical power and accessing vulnerable groups

Another limitation was the statistical power of this study. Due to the rarity of the population that was studied in this research, obtaining a large enough sample size to achieve high statistical power was challenging. Small sample sizes can lead to reduced reliability and generalisability of findings (Button et al., 2013). However, we did try to get as many autistic participants as possible and even implemented an extra questionnaire to identify people who might be autistic but did not get a formal diagnosis. Future research should try to enhance the

statistical power and sample size by perhaps collaborating with other researchers, countries, or even the government.

Additionally, individuals with ASD are part of a vulnerable group, which also makes it difficult to execute this study (Thurm et al., 2021). There are ethical considerations that one needs to take into when working with vulnerable groups, so future research must also make sure that the recruitment and procedure of participation is as inclusive, supportive and understanding as possible, perhaps through having mandatory training for all researchers involved (Thurm et al., 2021).

Conclusion

While this study has not found a significant reduction in anxiety levels among autistic individuals through the provision of prior procedural information, it has shown that there is a need for further investigation with larger and more representative samples, as there was a tendency for a decrease in anxiety levels in the autistic group that did get prior procedural information as opposed to the autistic group that did not get prior procedural information. Additionally, the findings also show that procedural information alone might not be enough to alleviate the anxiety in the context of an investigative interview.

Future research should consider a larger sample size of more autistic participants and a more standardised procedure to increase the reliability and generalisability of the findings. Ultimately, this study contributes to the efforts to better understand the needs of autistic individuals and it also highlights the importance of addressing the diverse needs of autistic individuals in the investigative research, aiming to improve the interviewing techniques in the future.

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Anxiety Questionnaire

Read each statement carefully and click the appropriate answer to indicate how you feel. There are no right or wrong answers, try to be as honest as possible and do not spend too much time on any one statement.

	Not at all	Somewhat	Moderately so	Very much so
I feel nervous.	0	0	0	0
I feel at ease	0	0	0	0
I feel jittery.	0	0	0	0
I feel comfortable	0	0	0	0
My body feels tense.	0	0	0	0
	Not at all	Somewhat	Moderately so	Very much so
I feel self-confident.	0	0	0	0
I feel tense in my stomach.	0	0	0	0
I feel secure.	0	0	0	0
My heart is racing.	0	0	0	0
I feel mentally relaxed.	0	0	0	0
	Not at all	Somewhat	Moderately so	Very much so
My hands are clammy.	0	0	0	0
My body feels tight.	0	0	0	0
I am confident of coming through under pressure.	0	0	0	0

Appendix **B**

Case Vignette



Your task today...

Please wait for the experimenter before you start! You have the opportunity to ask questions!



Please imagine yourself in the following situation...





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



Gran Via



Puerta del Sol



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 <u>favourite</u> 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 dinner, you pack your bag because next morning you are flying back to Enschede via Schiphol Airport.



Appendix C

Autism Spectrum Quotient Questionnaire

Below, you will find various statements describing situations you might come across in your day to day life. Please pick the answer that best describes the way you feel.

	Definitely agree	Slightly agree	Slightly disagre	e Definitely disagree
1. I prefer to do things with others rather than on my own.	0	0	0	0
 I prefer to do things the same way over and over again. 	0	0	0	0
3. If I try to imagine something, I find it very easy to create a picture in my mind.	0	0	0	0
 I frequently get so strongly absorbed in one thing that I lose sight of other things. 	0	0	0	0
5. I often notice small sounds when others do not.	0	0	0	0
6. I usually notice car number plates or similar strings of information.	0	0	0	0
7. Other people frequently tell me that what I've said is impolite, even though I think it is polite.	0	0	0	0
8. When I'm reading a story, I can easily imagine what the characters might look like.	0	0	0	0
9. I am fascinated by dates.	0	0	0	0
	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
10. In a social group, I can easily keep track of several different people's conversations.	0	0	0	0
11. I find social situations easy.	0	0	0	0

12. I tend to notice details that others do not.	0	0	0	0
13. I would rather go to a library than to a party.	0	0	0	0
14. I find making up stories easy.	0	0	0	0
15. I find myself drawn more strongly to people than to things.	0	0	0	0
 I tend to have very strong interests, which I get upset about if I can't pursue. 	0	0	0	0
17. I enjoy social chitchat.	0	0	0	0
18. When I talk, it isn't always easy for others to get a word in edgewise.	0	0	0	0
	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
19. I am fascinated by numbers.	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
 I am fascinated by numbers. When I'm reading a story, I find it difficult to work out the characters' intentions. 	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
 I am fascinated by numbers. When I'm reading a story, I find it difficult to work out the characters' intentions. I don't particularly enjoy reading fiction. 	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
 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. 	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
 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. 	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
 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 theatre than to a museum. 	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree

26. I frequently find that I don't know how to keep a conversation going.	0	0	0	0
27. I find it easy to 'read between the lines' when someone is talking to me.	0	0	0	0
	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
 I usually concentrate more on the whole picture, rather than on the small details. 	0	0	0	0
29. I am not very good at remembering phone numbers.	0	0	0	0
30. I don't usually notice small changes in a situation or a person's appearance.	0	0	0	0
31. I know how to tell if someone listening to me is getting bored.	0	0	0	0
32. I find it easy to do more than one thing at once.	0	0	0	0
33. When I talk on the phone, I'm not sure when it's my turn to speak.	0	0	0	0
34. I enjoy doing things spontaneously.	0	0	0	0
35. I enjoy doing things alone.	0	0	0	0
36. I find it easy to work out what someone is thinking or feeling just by looking at their face.	0	0	0	0
	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
37. If there is an interruption, I can switch back to what I was doing very quickly.	0	0	0	0
38. I am good at social chitchat.	0	0	0	0

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
	 	 ○ ○	 ○ ○

Appendix D

Prior procedural information

Voluntary Police Interview

What You Need to Know

You have been asked to attend a voluntary interview with the police or another law enforcement agency: This flyer will provide you with information about the voluntary police interview including what you can expect, and what your rights are.

What is a voluntary police interview?

A voluntary police interview or interview under caution is a formal conversation with police.

The interview aims to gather as many information about a specific incident as possible.

You do not have to attend, and you can leave at any time once the interview has begun.

While a voluntary interview might be conducted in a less formal way than an interview under arrest, the **conversation will still be recorded** and anything you say can potentially be used against you in any subsequent criminal proceedings.

The Interview

Before the interview, you are formally cautioned. Your legal rights are:

- Right to hire your own lawyer
- If you do not have a lawyer, you can apply for a free lawyer, we will provide you with a phone number
- Right to remain silent (you do not have to answer questions if you do not want to)
- Everything you say can be used against you in front of a court of law

At the start of the interview, your interviewer will tell you:

- The names of all people in attendance
- The purpose of the interview including the incident under investigation
- That you can choose to end the interview at any time
- That you do not have to say anything
- That anything you do say can be used against you in a court of law

During the interview, the police officer will ask you questions which can cover issues such as:

- Your whereabouts at certain times Whether you know certain people
- Your knowledge of specific events

You have the right to breaks (normally 15 minutes every two hours) if the interview goes on for this long.

Appendix E

Interview Guideline

 you have the right to remain selent, anything you say can and will be used against you in the cauch of law.
 you have the right to an attourney i you cannot offered one, one will be appointed. INTERVIEW 3, did you understand 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 F

Debrief

Debrief

Study objective

Contact with law enforcement can be a stressful and anxietyinducing process, especially for people on the spectrum. Therefore, we want to compare how autistic people in comparison to neurotypicals behave and react at border control: What are the differences in stress and anxiety levels; how does rapport differ between the police officer and participant; and finally, what strategies do participants use to appear innocent? Further, we want to test whether giving participants procedural information previous to the interaction with the police officer can reduce uncertainty and therefore, limit stress and anxiety. Our goal is to find strategies that can aid autistic people without harming the investigative process.

How did it work?

As a participant in this study, you received the case vignette and were randomly assigned to one of two conditions. One of these conditions received procedural information, i.e. what to expect during an interaction at border control, and the other condition does not. Both conditions got their legal rights read. The procedural information includes information about interview settings, such as time needed for the interview, who will be there and the aim of the interview. After the interview everyone received the same survey with which we want to measure if anxiety, stress rapport, and strategy for the interview differ between the two conditions.

Why is this important?

This research aims to develop a better understanding of how procedural information can counteract the challenges individuals with Autism Spectrum Disorder (ASD) experience during investigative interviews. Increasing the fairness and efficacy of investigative interviews is paramount in ensuring justice and equality for all individuals, including those with autism spectrum disorder.

Withdrawing Policy

If you decide that you want to withdraw from this research, please contact us (researchers) within 10 days and quote your participation number to allow us to locate your data and withdraw it. Your participation number is:

Contact

If you have questions about your rights as a research participant, wish to obtain information, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee: ethicscommittee@bms@utwente.nl

For further information about this study, contact the principal investigators Lynn Weiher, Ph.D. at L.weiher@utwente.nl or Yasmin Saciri, y.saciri@utwente.nl

Many thanks for taking the time to participate in our research!