Journal of Autism and Developmental Disorders
https://doi.org/10.1007/s10803-022-05835-1

S.I. :FIRST RESPONDERS AND AUTISM

Creating the Global Criminal Justice Survey: A Questionnaire Designed to Gather Perspectives from the Autism Community and Criminal Justice Professionals

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Accepted: 14 November 2022

Abstract

Autistic people's perceptions of their interactions with criminal justice professionals are predominantly negative; however, little is known about the state of interactions on a global scale. To further understanding, a comprehensive stakeholder questionnaire was created. Aspects of reliability and validity including evidence for test content and internal structure were gathered using expert reviews, cognitive interviewing, pilot data collection, and a larger data collection effort ($N = 1618$). Data was gathered from the autism community through perspectives of parents/caregivers as well as from self-reported autistic adults. Criminal justice professionals included law enforcement officers, corrections professionals, probation and parole officers, forensic psychologists and legal professionals. The scale development process was detailed in order to sufficiently document the initial psychometric evidence and share the steps taken to gain diverse stakeholder input. This study is a critical first step in generating further information to facilitate policy and program development with wide applicability.

Keywords autism spectrum disorder · psychometrics · criminal justice system · police

The core characteristics of autism including social and communication differences, strong interests and preferences for routine, along with different processing of sensory information (American Psychiatric Association, 2013) may increase the likelihood of criminal justice system (CJS) involvement for autistic people. There is emerging evidence that points to an increased risk of CJS contact for autistic people compared to the general population (Farley et al., 2018; Lunsky et al., 2015; Rava et al., 2017; Tint et al., 2017, 2019; Turcotte et al., 2018). Most of the research has focused on rates of offending behaviour leading to higher rates of CJS involvement (King & Murphy, 2014), however, recent studies have found that contact as a result of being a victim of crime(s) or from seeking assistance from police may account for a

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Published online: 13 January 2023

large proportion of these interactions (Christoffersen, 2019; Gibbs & Haas, 2020; Richardson et al., 2016; Weiss & Fardella, 2018).

Interactions with the CJS can be particularly stressful for autistic people resulting in high levels of anxiety and trauma (Copenhaver & Tewksbury, 2019; Holloway et al., 2020; Maras et al., 2017; Salerno & Schuller, 2019). Autistic adults' accounts of encounters with police, for example, are predominantly negative with descriptions of high levels of dissatisfaction, frequent misunderstandings, use of excessive force and unjust treatment (Copenhaver & Tewksbury, 2019; Crane et al., 2016; Gibbs & Haas, 2020; Salerno & Schuller, 2019) often resulting in feelings of distrust and fear towards police (Crane et al., 2016; Helverschou et al., 2018). Similar experiences have been reported in other components of the CJS, such as interactions with legal professionals or in prisons or justice facilities. Autistic individuals have described dissatisfaction with communication, sensory experiences, and legal representation in the court environment (Maras et al., 2017). In prison settings, autistic people are more likely to be victimized by other inmates and are more likely to self-harm (Esan et al., 2015; McCarthy et al., 2019; Newman et al., 2015).

Personnel within the CJS also describe difficulties when interacting with autistic individuals in their professional role and endorse training opportunities to be better able to identify autistic people and increase their knowledge of strategies that may enhance communication and reduce the likelihood of escalation (Crane et al., 2016; Gardner et al., 2019; George et al., 2018; Kelly & Hassett-Walker, 2016; Salerno & Schuller, 2019; Railey et al., 2020b). Although autism-specific training has been delivered to police and other legal professionals, and training has been shown to increase autism knowledge (Teagardin et al., 2012; Murphy et al., 2017), there is limited evidence demonstrating this results in any meaningful behavioural change in a real-world setting or whether the strategies that are typically recommended are, in fact, beneficial for the autistic person or the CJS professional. Additionally, there is no research-based curriculum or intervention that can be used across pilot studies, as preliminary trials to date use different delivery modes, curriculum, and methods (e.g., Love et al., 2020; McGonigle et al., 2013; Teagardin et al., 2012).

Autism Knowledge

Increasing the awareness and knowledge of autism for CJS professionals is a shared goal across all stakeholders including the autistic community and CJS professionals who acknowledge deficits in this area (Crate et al., 2016; Love et al., 2022; Rava et al., 2017; Railey et al., 2020a). The latent construct of autism knowledge has been used and measured in diverse ways across multiple constructs as researchers attempt to understand how autism knowledge may relate to attitudes and behaviour in order to plan and evaluate targeted interventions (Harrison et al., 2017, 2019). Among CJS professionals, findings have been inconsistent. Love and colleagues (2020) surveyed police officers in the United States and found that autism knowledge was positively associated with their perceived confidence to support individuals on the autism spectrum. In contrast, Copenhaver and colleagues (2020) examined police cadet autism knowledge and found that cadets who reported a stronger confidence in their ability to interact with individuals on the autism spectrum actually had lower autism knowledge than those with less confidence. A number of studies have demonstrated that training for police officers increased autism knowledge (Gardner et al., 2019; Gardner & Campbell, 2020) although knowledge scores often remained relatively low, despite any gains acquired from the training (Teagardin et al., 2012). McGonigle and colleagues (2013) developed an autism training manual for Emergency Medical Services (EMS) personnel and nurses and found improvement in autism knowledge and levels of comfort in supporting autistic individuals. It is highly possible that differences in how autism knowledge is measured may account for the variable results. Finding a consistent and standardized tool for measuring autism knowledge is a known challenge due to diverse populations and tools designed for specific study parameters, as Harrison and colleagues (2016) have shown. Therefore, more work is needed to understand the latent variable of autism knowledge so that measurement is standardized and results can be reliable and valid and interpreted across studies and amongst the components of the CJS.

Similarly, perceived autism knowledge has been measured as a distinct construct as an additional way to measure the value of police training or the potential impact (Holloway et al., 2022). Perceived autism knowledge scores may be different to actual autism knowledge because people may overestimate or underestimate their skills, performance, or knowledge. McMahon and colleagues (2020) found that perceived autism knowledge was not related to actual autism knowledge in a sample of the general population. In contrast, trainee clinicians demonstrated a significant association between self-reported and actual knowledge of autism (Bono et al., 2022), indicating that both constructs are needed to enhance understanding of participants in a study. For criminal justice professionals, both perceived autism knowledge and actual autism knowledge may be important outcomes to understand how to improve training opportunities, fund policy opportunities, and increase awareness, resources, and tools.

Police Attitudes

Interactions between police and the autistic community have been more extensively researched than interactions between autistic individuals and criminal justice professionals in other roles, such as legal professionals or court professionals. In previous work with the general population, examinations of interactions between community members and the CJS have included constructs that reflect perceptions and attitudes towards police within the local context. These self-report measures include terms such as procedural justice, police legitimacy, and police performance. Each of these constructs has been measured in a similar way and all hold associations with how people will respond to police in their community including their likelihood to obey the law, cooperate with legal authority, and have trust in police (Hinds & Murphy, 2007; Reisig et al., 2012; Watson et al., 2010). These constructs also relate to an individual's satisfaction with the CJS (Hinds & Murphy, 2007). Reisig and colleagues (2012) studied police legitimacy within a Slovenian context, defining the term as an individual's perception of how fair the police are as they exercise their authority or "the factors that shape legitimacy perceptions of criminal justice institutions" (p. 151). Other researchers define police legitimacy as a two-dimensional concept that includes an individual's trust in police and their obligation to obey police (Tyler, 2003; Reisig et al., 2007; Sunshine & Tyler, 2003). Police legitimacy has been shown to have a strong, positive relationship with procedural justice which is a similar construct, but reflects how people feel they are treated by the police as well as their perceptions of police decision-making (Hinds & Murphy, 2007; Reisig et al., 2012; Tyler & Huo, 2002). Perceptions of being treated in a fair and just way have been shown to be associated with higher satisfaction with police actions regardless of the outcome of the encounter (Jones & Thomas, 2018; Livingston et al., 2014). A final construct, police performance, was measured by Hinds and Murphy (2007) who were looking at the larger construct of police legitimacy in an Australian context. Police performance was defined by Hinds and Murphy (2007) as an individual's perceptions on "whether they thought police do a good job in fighting crime" (p. 33). Results of their study found procedural justice and police performance to be related but diverse constructs, that together predicted police legitimacy and satisfaction.

Autistic adults' ratings of perceived procedural justice following encounters with police have consistently been found to be low (Gibbs & Haas, 2020; Salerno & Schuller, 2019). In a qualitative study of 12 autistic adults and 19 parents of autistic individuals who had interacted with police in the previous five years, the adults' perceptions of procedural justice were predominantly negative while parents' perceptions were mixed (Gibbs et al., 2021). Neither police performance or police legitimacy have been examined amongst autistic people and given the relationship between these constructs and overall satisfaction with police treatment, more research on the topic is warranted. Additionally, this study was designed and carried out during the aftermath of the murders of George Floyd and Breonna Taylor in the United States and the subsequent international Black Lives Matter movement. Combined with the COVID-19 pandemic and the associated enforcement by police of public health orders in many jurisdictions, it was considered important to examine attitudes towards police across the global context. What is not yet known, however, is the pattern of responding within a population of autistic adults and CJS professionals.

A Global Approach

The majority of research in this area has focused on singular aspects of the CJS, most commonly prisons and forensic hospital settings, and law enforcement (Cooper et al., 2022). To date, no study has systematically gathered information across all levels of the CJS and few have been conducted outside the United States and United Kingdom (Cooper et al., 2022). To develop priorities for policy, practice, and research advancements in this area it is essential that a broad baseline of the current situation is obtained. The Sequential Intercept Model (SIM) is a framework for organizing research on CJS involvement, and has been used to categorize intervention development, research, and policies surrounding the involvement of persons with serious mental illness in the CJS (Munetz & Griffin, 2006). The SIM was revised in 2020 by an international consortium funded by the International Society for Autism Research (INSAR) for the purpose of developing a policy brief aimed at improving interactions between autistic people and the CJS. The consortium consists of 50 community stakeholders across multiple continents including autistic individuals, parents and caregivers of autistic individuals, criminal justice professionals, policymakers, and researchers. The revised SIM (Shea et al., 2021) consists of seven intercepts, or points of contact with the CJS, where intervention could divert individuals from further involvement, and provides a framework to propel research across typically siloed CJS sectors. Intercept 0 is Community Services, Intercept 1 covers Law Enforcement, Intercept 2 captures the Initial Detention and Investigation, Intercept 3 includes Courts, Intercept 4 is Prisons/Jails/Confinement, Intercept 5 is Re-entry to Society, and Intercept 6 encompasses Community Corrections.

Purpose of the study. Following the revision of the SIM to map research and policy across multiple components of

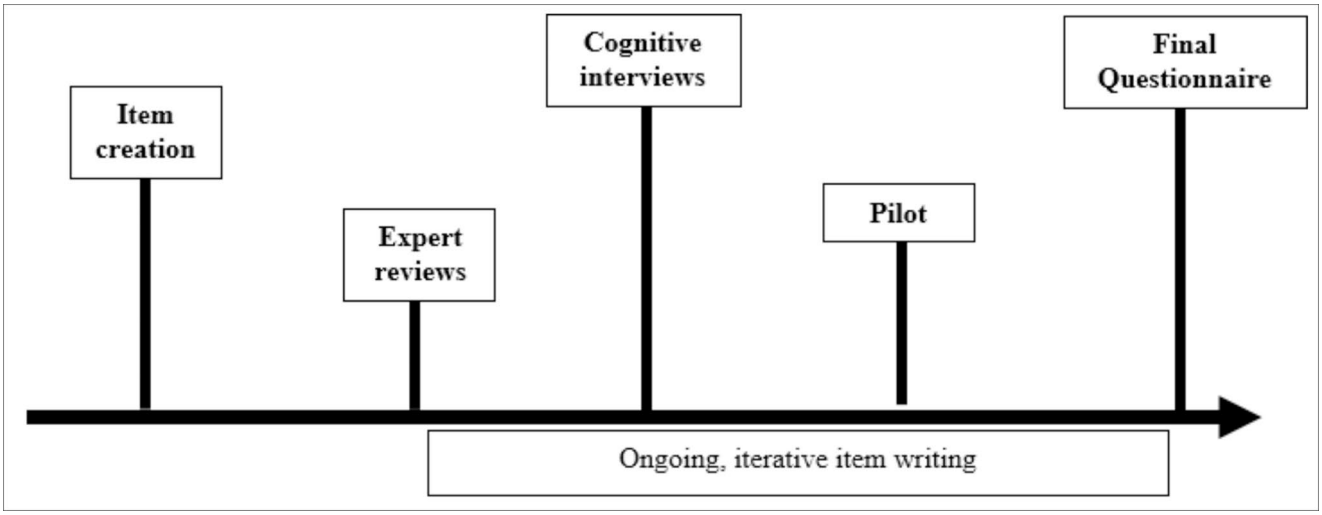

Fig. 1 Scale development steps taken to develop the Global Criminal Justice Survey

the CJS, baseline data was needed to examine and compare globally, the experiences of autistic individuals and their interactions with CJS professionals. As part of the effort to improve interactions between autistic people and the CJS, the international consortium developed a questionnaire that would gather perspectives across international experiences, between stakeholder groups, and at each intercept of the CJS. Intentional scale development steps were taken to ensure that the inferences made from the results of the questionnaire would be accurate and reflective of the intention of the tool. The questionnaire was developed in collaboration with a group of stakeholders based on the Standards of Educational and Psychological Testing (AERA/APA/NCME, 2014) and the scale development steps defined by Kyriazos and Stalikas (2018), who examined multiple sources and created an integrative approach to the scale development process. The validity and reliability data within this study are intended to support future replications of work of this kind and to contribute to the measurement of these commonly measured constructs, a noted area of weakness within autism CJS research (Harrison et al., 2017). Therefore, the purpose of this paper was to outline the development and validation of the questionnaire that was designed to gather information regarding interactions between autistic people and the CJS from the perspective of autistic adults, parent/carers of autistic people and criminal justice professionals. Specifically, psychometric properties including sources of reliability and validity will be provided for the intended latent constructs (e.g., autism knowledge, procedural justice). Sources of validity will include evidence based on test content, response processes, and evidence for internal structure (AERA et al.,2014).

Methods

The aim of this research was to gather psychometric evidence on a large questionnaire intended for stakeholders (e.g., autistic people, parents and carers of autistic individuals, and criminal justice professionals) about interactions between police officers and the autistic community. To achieve this goal, we followed the steps outlined in Fig. 1 to gather a degree of evidence for validity and reliability. Approval was obtained from Drexel University's Institutional Review Board (#2007007985).First, the scale development steps are detailed followed by a description of the final questionnaire data collection procedures.

Global Criminal Justice Survey (GCJS)

The GCJS is a dynamic questionnaire with item totals responsive to the individual experiences of the survey respondent. It was translated professionally into fifteen languages to aid dissemination and completion globally. The GCJS includes items for parents/caregivers, CJS professionals, and autistic adults and measures three primary constructs including perceived autism knowledge and autism knowledge for criminal justice professionals and police attitudes (e.g., perceived procedural justice and police legitimacy) for autistic adults and parent/carers. These primary constructs will be the focus of the analyses and results. The remaining items on the GCJS are a combination of existing, validated scales, and newly created items. Items assessing the frequency, nature, contexts, outcomes and perceptions related to interactions between autistic people and criminal justice professionals were newly written for the purpose of this survey through an iterative process including examination of relevant literature, consultation with experts ($n = 40$),

piloting of the survey with 58 representatives of each of the participant groups ($n = 12$ adults, 7 parent/carers and 39 CJS professionals), and cognitive interviews with 5 participants. Three versions were developed (for autistic adults, parent/carers and CJPs) gathering similar information with wording changes to suit the respondent's profile (see Table 1).

Item creation. The initial pool of items was developed based on a review of relevant literature and discussions among members of the survey workgroup which consisted of 12 members from the larger consortium. Items included novel questions developed for the purposes of this study and questions from validated scales used in previous studies that covered the following domains for autistic adults and parent/carers of autistic adults including (a) context and nature of prior experiences, (b) accommodations provided and outcomes for each level of the CJS, as well as (c) attitudes towards law enforcement. For CJS professionals, novel items were developed to gather information about autism knowledge, prior experiences and level of preparedness in relation to interacting with autistic people in a professional capacity.

Autism knowledge. Autism knowledge was assessed with a subset of items from the Autism Stigma & Knowledge Questionnaire (ASK-Q; Harrison et al., 2017, 2019). The scale originally consists of 48 items from four subscales: (a) diagnosis, (b) etiology, (c) treatment, and (d) stigma. Harrison and colleagues (2017) published cutoff scores for each subscale which demonstrate adequate knowledge. For the purposes of this study, only the diagnosis items were used, which resulted in an 18-item measure, where scores in the 11–18 range are considered the cutoff score for adequate knowledge. Participants answered using a dichotomous "agree" or "disagree" and Harrison and colleagues (2017) reported a total score reliability of $\alpha = 0.88$. For this study, only the diagnosis subscale was used to reduce the number of items participants needed to complete and because these items best represented autism knowledge that would be expected of criminal justice professionals. Rasch techniques were used due to the dichotomous response format to explore the psychometric properties of the items within this scale.

Perceived autism knowledge was assessed with an adapted version of the Perceived Autism Knowledge Questionnaire (PAKQ; McMahon et al., 2020), a 6-item measure with a 5-point Likert-type response scale ranging from *strongly disagree* to *strongly agree*. A total scale score reliability ($\alpha = 0.88$) was previously demonstrated by McMahon and colleagues (2020) on a sample recruited from Amazon Mechanical Turk platform. A sample item for this instrument reads, "I know autism is different from other psychological or developmental disorders." For the purposes of this study, we used 5 items and a dichotomous "yes" or "no" response format. One item that read "I don't know much about how autism is diagnosed" was dropped because criminal justice professionals are not expected to know much about autism diagnosis. Again, Rasch techniques would be used due to the dichotomous response format to determine the appropriateness of these 5 items representing the latent construct, *perceived autism knowledge.*

Attitudes towards law enforcement. To measure autistic and parent/caregiver attitudes towards law enforcement, 23 items were gathered from a range of scales that measured constructs including procedural justice, police performance, and police legitimacy. The items would be subjected to an exploratory factor analysis (EFA) due to the continuous response format to see if they represented one unidimensional construct or multiple factors. An EFA was appropriate because the items were being combined into one scale to explore the structure of responding. Three items came from a police performance scale created by Hinds and Murphy (2007) who reported total score reliability as $\alpha = 0.84$. Participants responded to the police performance questions using a 4-point Likert-type response scale that ranged from *very poor job* to *very good job.* An additional 17 items measured procedural justice from two scales. The first six items were proposed by Reisig and colleagues (2012) who reported a total scale reliability of $\alpha = 0.78$. Additionally, 11 items from Watson and colleagues (2010) were used, $\alpha = 0.84$. Finally, police legitimacy was measured with 4 items from Reisig and colleagues (2012). For all procedural justice and police legitimacy items, participants responded using a 4-point Likert-type response scale that ranges from *strongly disagree* to *strongly agree.* These items were all considered to measure varying attitudes towards police and results of an EFA would determine their interpretation.

Validity Evidence for Test Content

Before using a questionnaire, it was important to understand and analyse the relationship between the latent constructs and content within a scale and the intentions of the researchers designing the scale. Making these details transparent before the data is used helps increase true interpretation of the data and improve replication. This analysis includes using experts to look at the items, word choices, and themes to describe them and ensure that they measure the construct as it was intended (AERA et al., 2014) For this study, a degree of validity evidence for test content was gathered through three processes: expert reviews, cognitive interviews, and a pilot administration.

Expert reviews. Once potential items had been identified for inclusion in the GCJS, the initial item pool underwent expert review by the wider consortium. For each item, members of the consortium were asked to provide feedback

on the clarity of wording, the level of relevance and the degree to which the items captured the areas of importance. Each expert completed a review of the initial pool of items independently and provided feedback to the GCJS workgroup through Qualtrics or through individual communications. This process was iterative and included feedback from experts across stakeholder groups including autistic individuals, autism experts and professionals, policymakers, and researchers. Consensus was determined when no experts requested further deletion or modification of the items.

Cognitive interviews. Another step taken in the instrument development process involved cognitive interviews with representative of each of the participant groups and to ensure accuracy and accessibility. The goal of this step was to provide a degree of evidence for validity based on response processes (AERA et al. 2014). This step helps "identify items where there is a misalignment between participant interpretation and the developer's intentions and to identify ways to modify those items" (Peterson et al., 2017, p. 217). The goal of these interviews was to use think-aloud questioning to gather an understanding about how the participants were interpreting the items, ensuring this aligned with the content and goals of the tool (Peterson et al., 2017). Cognitive interviews were completed after the first round of expert review. In total, five participants were recruited to take part in the cognitive interviewing phase and participants were recruited including two members of the autistic community and three criminal justice professionals from diverse backgrounds. One member of the research team conducted cognitive interviews over the phone with each participant and followed verbal scripts and scripted probes. Feedback from the interviews were reviewed by the GCJS workgroup and opportunities for item modification were flagged. This interviewing methodology is consistent with recommendations by Willis (2013) and Peterson et al. (2017). Following the cognitive interviews, the items were subjected to one more expert review process.

This process was important because it allowed a researcher to listen to the thought processes of a potential respondent as they read the items. Cognitive interviews have demonstrated utility in survey development in many domains because it provides opportunity for researchers to ensure they are asking the right questions, further increasing evidence for validity (Wolcott & Lobczowski, 2021). To demonstrate the impact that this process had, we provide one example below. After reading aloud an item during a cognitive interview, the cognitive interview participant (a police officer) was probed to make sure that they understood the item the way that was intended:

Interviewer Okay, go on to read the next question and let me know what you think.

Participant 'How equipped do you feel to support individuals with autism in your professional capacity? I am having trouble with the word equipped here. What exactly are you trying to say? Do we have the right supplies or tools?

Interviewer Here we were trying to see if the participant felt ready to have an interaction with someone with autism. What would you suggest we say instead of equipped?

Participant Maybe adding educated instead of equipped? I just think that because police officers carry tools and equipment, that makes me wonder if I need special equipment for my interactions with people with autism.

As was evidenced here, this process gave us the change to change the way survey items were worded, to adjust how questions were displayed, and to remove confusing questions when possible.

Pilot. According to Rubio et al. (2003) experts also include those who share similar demographics as future participants. Representatives of each of the three participant groups across a range of ethnic backgrounds and geographical locations were invited to complete the draft survey in Qualtrics and were asked to provide feedback on the wording and relevance of the items as they piloted the questionnaire. In total, 12 autistic adults, seven parent/carers and 39 CJS professionals participated in the pilot phase. All feedback received was considered by the GCJS workgroup and a number of changes were made to the questionnaire items as a result including minor wording changes and removal of some items. One additional item related to fear of police was also added based on feedback received. In addition, participants who piloted the measure were invited to provide feedback on any problematic items or challenges that they had while completing the questionnaire.

Final questionnaire. Feedback was gathered multiple times during the questionnaire design. From these cumulative scale development processes, ongoing notes were kept to record sources of feedback, the direct feedback provided, and the action steps taken. The final questionnaire resulted in a dynamic questionnaire, that changes based on participants responses. There were three versions created, one for autistic adults, one for parents/carers, and one for CJS professionals (see Table 1).

Participants

There were three participant groups for the study: autistic adults (professionally diagnosed or self-identified), parent/

Table 1 Description of latent variables within the GCJS.

Autistic individuals	CJS professionals
Demographics	
Police attitudes	Perceived autism knowledge
Police interactions: Most recent and last 5 years	Autism knowledge
Experiences with legal professionals, court system, corrections, probation and parole	Prior autism training and further training needs
	Interactions with autistic people:Nature, outcomes, adjustments provided

carers of autistic people of any age and criminal justice professionals (defined as police/law enforcement, corrections/juvenile detention, probation and parole officers, forensic psychologists and legal professionals). The parents/carers participant group were asked to respond on behalf of their child, as an attempt to learn about the experiences of children and autistic individuals who would not be able to complete an online questionnaire independently due to various reasons including their age, language level or autism severity. In total, 1618 participants provided responses to the questionnaire which included 302 autistic individuals, 574 parents/carers, and 742 criminal justice professionals. Only selected demographic details are included in Table 2 due to the focus of this paper on the scale development steps.

Community Involvement

We sought to co-produce this research so that our study reflected a level of community involvement where both autistic and nonautistic perspectives were included together (den Houting, 2021). Autistic input was sought purposefully throughout the development process in two primary ways. First, family members and carers were included in the survey workgroup and were included in the lifecycle of the study. Secondly, each survey workgroup team member who represented multiple countries sought feedback at key points in the project from their autistic collaborators. For example, autistic research assistants and advisory committees were asked to review items at key steps in the process, and autistic community participation was intentionally sought globally to ensure context-specific feedback was provided.

Results

Recall that the aim of this research was to transparently detail the scale development process and confirm the psychometric properties of validated scales for future replication purposes as well as scoring implications. Results are organized by type of validity evidence. Evidence for test content was gathered and described in the methods section. Analyses were conducted in WINSTEPS version 3.70 (Linacre, 2016) and SPSS.

Table 2 Participant demographic variables from the Global Criminal Justice ($N = 1706$)

	Autistic Individual ($n = 302$)		Autistic Individuals As Reported by Parents/Carer Participants ($n = 574$)		CJS Professionals ($n = 742$)	
	n	**%**	***n***	**%**	**n**	**%**
Gender						
Man	145	48.2	438	76.3	459	62.0
Woman	126	41.5	123	21.4	*	*
Other	31	10.3	13	2.3	*	*
Race/Ethnicity						
Asian/Pacific Islander	13	4.3	25	4.3	17	2.3
Black	*	*	38	6.1	71	9.6
Hispanic/Latinx	*	*	20	3.5	29	3.9
Two or More Races	12	4.0	23	4.0	24	3.2
White	251	83.1	403	70.2	560	75.5
Other/Prefer Not to Say	18	6.0	36	6.3	41	5.5
Country						
North America	99	32.8	376	65.5	558	75.2
Scandinavia	113	37.4	102	17.8	28	3.8
Oceania (Australia + New Zealand)	27	8.9	29	5.1	53	7.1
Europe	50	16.6	24	4.2	85	11.5
Other Countries	13	4.3	43	7.5	18	2.4
	Mean	***SD***	**Mean**	***SD***	**Mean**	***SD***
Age (in years)	35.5	11.8	16.8	8.6	45.2	11.4

Table 3 Autism knowledge and perceived autism knowledge

Autism Knowledge	
Item 1	I have prior knowledge of autism
Item 2	Some children with autism may lose acquired speech.
Item 3	Individuals with autism may have strange reactions to the way things smell, taste, look, feel, or sound.
Item 4	Many individuals with autism have trouble understanding facial expressions.
Item 5	Some individuals with autism do not talk.
Item 6	Many individuals with autism have trouble tolerating loud noises or certain types of touch.
Item 7	All individuals with autism usually have problems with aggression.
Item 8	Individuals with autism do not enjoy the presence of others.
Item 9	Individuals with autism are also intellectually disabled.
Item 10	Individuals with autism show the need for routines and sameness.
Item 11	Most children with autism may not look at things when you point at them.
Item 12	Some children with autism show intense interest in parts of objects.
Item 13	Many children with autism repeatedly spin objects or flap their arms.
Item 14	A lot of individuals with autism have problems with being aggressive or hyperactive.
Item 15	Many times individuals with autism have an intense interest or preoccupation.
Item 16	Many individuals with autism have difficulty using everyday language to communicate their needs.
Item 17	There is currently no medical test to diagnose autism.
Item 18	Many individuals with autism get upset if their routine is changed.
Perceived Autism Knowledge	
Item 1	I can usually recognize the signs and symptoms of autism.
Item 2	I know autism is different from other psychological or developmental disorders.
Item 3	I am confused about how to define autism.
Item 4	I know a lot about autism.
Item 5	I would have difficulty explaining autism to someone else.

Note. Participants replied to these items using a dichotomous *agree* and *disagree* response format; The stem for the autism knowledge items read, "For each question, please choose the option that best matches your current beliefs and understanding about autism spectrum disorders." The first item was not scored and was used as a screener for individuals who had no experience with autism spectrum disorders

Validity Evidence for Internal Structure

First, to gather evidence for internal structure of the scale, we aimed to gather the psychometric properties of the 17 items that represented the latent construct *autism knowledge* (see Table 3). As a reminder, these items were a subscale that was present in a larger Autism Stigma & Knowledge Questionnaire and we wanted to test the hypothesis that these items could measure "autism knowledge" for our sample of criminal justice professionals. A Rasch Principal Components Analysis (R-PCA) of the item residuals was completed to look at the contrasts (Linacre, 2019) and determine the dimensionality, and results indicated that 48.2% of the variance was explained by the model. The contrasts, which are the correlated residual clusters, were examined to confirm the unidimensional structure and results showed that less than 4% of the unexplained variance could be attributed to the existing contrasts. Results demonstrated that these items can be used to represent the construct *autism knowledge* in future analyses with this data. Additionally, reliability was determined with two scores: person separation reliability (0.87) and item separation reliability (0.95). Overall internal consistency, or a traditional alpha coefficient, was 0.86.

Next, the five items representing the construct *perceived autism knowledge* were examined. A R-PCA of the item residuals was completed and results indicated that 44.7% of the variance was explained by the model. The contrasts, which are the correlated residual clusters, were examined to confirm the unidimensional structure and results showed that less than 4% of the unexplained variance could be attributed to the existing contrasts. Results demonstrated that these items can be used to represent the construct *perceived autism knowledge* in future analyses with this data. Person separation reliability for the items that represented autism knowledge was 0.81, item separation reliability was 0.85, and $\alpha = 0.82$.

Finally, results from the 23 item scale measuring *attitudes towards law enforcement* were studied at the item-level to review means, standard deviations, and an examination of a polychoric correlation matrix. All items were intercorrelated above 0.30. Factorability was determined to be sufficient with the Kaiser-Meyer-Olkin measure of sampling found to be 0.906, which is above the recommended value of 0.50 (Williams et al. 2012). Bartlett's test of sphericity was statistically significant (7329.22, $p < 0.001$). The scree procedure (Cattell, 1966) and Horn's (1965) parallel analysis (Lim & Jahng, 2019) were conducted and confirmed the two-factor solution. The data was subjected to a principal components analysis to understand the factors underlying the construct. The two factor solution explained 42.3% of the variance and was chosen because of the conceptual meaning of the factors.

One factor was meaningfully named "personal attitudes" due to the content of the items being focused on a participant's police attitudes based on their personal interactions with police and the second was named "community based attitudes" because the items reflected how a participant views the police in their community (see Table 4). Coefficient alpha was used to look at each factor, with $\alpha = 0.93$ for the "personal attitudes" factor and $\alpha = 0.97$ for the

Table 4 Factor analysis of the items representing attitudes towards law enforcement

Items	Factor 1 "Personal Attitudes" 11 itemsλ	Factor 2 "Community Attitudes" 12 itemsλ
Police procedure justice (Watson et al., 2010)		
The police seemed genuinely concerned about my child as a person.	0.55	
The police treated my child respectfully	0.73	
The police treated my child like a human being	0.71	
The police tried to be helpful to my child	0.78	
The police tried to do what they thought was best for my child	0.72	
The police took the time to listen to my child and understand my child's situation	0.77	
The police tried to understand what my child needed	0.78	
The police tried to ask my child simple questions	0.75	
I am happy with the way the police dealt with the situation.	0.75	
The police gave my child enough time to do what was asked.	0.73	
I felt safe for my child when they interacted with police.	0.78	
Procedural Justice (Reisig et al., 2012)		
The police treat everyone with dignity		0.82
The police make decisions based on facts		0.94
The police explain their decisions to the people they deal with		0.71
The police make decisions to handle problems fairly		0.94
The police follow through on their decisions and promises they make		0.62
Police Performance (Hinds & Murphy, 2007**)**		
How good a job are the police doing in dealing with the problems that really concern people in your community?		0.94
How good a job are police doing in your community in working together with residents to solve local problems?		0.94
How good a job do you think police are doing?		0.94
Police Legitimacy (Reisig et al., 2012)		
I have confidence in the police.		0.94
People should always follow the directions of police officers even if they go against what they think is right.		0.82
Police do their job well.		0.69
I have great respect for the police.		0.82

Note. λ = standardized factor loadings; For the purpose of this table, factor loadings that are > 0.30 are displayed

"community attitudes" factor. Higher scores on the attitudes towards law enforcement scale reflect higher levels of perceived police legitimacy and procedural justice.

Discussion

This study provided psychometric data and scale development procedures for constructs within the newly created Global Criminal Justice Survey (GCJS). Transparent details of the scale development process will help to increase confidence that the findings from the study are reflective of measurement intentions, and allows for a clear and concise next step with the data collected. The final questionnaire was designed by way of seeking input from criminal justice professionals, international researchers, experts in the field of autism research, and through consultation with autistic communities. Following item creation, Rasch analyses explained the items measuring *autism knowledge* and *perceived autism knowledge*, and results reflected a unidimensional construct with adequate reliability. Finally, exploratory factor analysis identified a two-factor solution for the items representing *attitudes towards law enforcement*, consisting of personal attitudes and community attitudes. These two components are a novel finding for the area of autism policing attitudes, and may represent the idea that autistic individuals and family members or caregivers have differing beliefs when thinking about their own family and police interactions compared to perceptions of police interactions among their community in general. More analyses and exploration into this distinction will be warranted to understand this finding. Positive attitudes and consequently trust and confidence in police are consistently noted as requirements for public cooperation to facilitate interactions that yield constructive outcomes and reduce adverse outcomes (Jones & Thomas, 2018; Livingston et al., 2014). As research seeks to determine the most effective way to train police and other criminal justice professionals about autism, an understanding of autistic adults and parents and carers can help to inform these training opportunities. Data from this questionnaire can also help to add to literature that supports the idea that community attitudes are linked to police contact. For example, Peyton

and colleagues (2019) found that positive nonenforcement contact between a police officer and a community member can result in more positive public attitudes towards police. That finding, combined with results from initial autism training that reports that knowledge is not enough (Gardner & Campbell, 2020) can be used to design curriculum-based training, technical assistance, and increased contact to improve autistic community attitudes toward police.

Research to date indicating low levels of satisfaction and low ratings of perceived fair and just treatment on the part of autistic people who have interacted with police and other criminal justice professionals (Copenhaver & Tewksbury, 2019; Crane et al., 2016; Gibbs & Haas, 2020; Salerno & Schuller, 2019), and CJS professionals' lack of confidence and knowledge around autism and desire for further training and support in this area (Crane et al., 2016; Gardner et al., 2019; Gardner & Campbell, 2020) suggest an urgent need for resources devoted to this issue, policy, and program development. However, most of the research conducted has consisted of small samples, predominantly from the US and UK, with a focus on only one component of the CJS (Cooper et al., 2022). The GCJS represents the first step in developing a further understanding of the factors that influence the nature of interactions between autistic people and all stages of the CJS from a global perspective. Identifying both common and unique themes across contexts, stakeholders and nations will facilitate the development of comprehensive policy recommendations, opportunities for new program development, practical strategies that replicate where interactions may have been successful, and future research directions to understand down- and upstream factors impacting these interactions (Shea et al., 2021). The latent constructs that were measured as part of this international collaboration of researchers, practitioners, CJS professionals and members of the autistic and autism communities can be utilised in future research which will assist in comparing synthesized results across samples and across time. The data collected from the GCJS will be analysed to determine the nature, extent, and characteristic of autistic people's interactions with the CJS internationally and identify any predictors or correlates of positive and negative perceptions in relation to these experiences or attitudes towards police. CJS professionals' actual and perceived knowledge of autism and how that relates to prior access to autism training will also be examined. All of the data will be analysed to identify any differences across country, stage of the CJS, and participant characteristics such as age, gender, ethnicity etc. Qualitative responses in relation to disclosure decisions and outcomes and fear and hesitancy to contact police will also be analysed. The information arising from this first large-scale international research collaboration on autism and the CJS will provide critical baseline information for researchers and policy-makers.

Limitations

There are limitations worth noting within this study. Primarily, the GCJS was a lengthy questionnaire that consisted of self-report data collected across multiple countries and in multiple languages. Future analyses such as differential item functioning should examine the data to gather evidence for validity and reliability across countries and through translated versions. Additionally, the data for the study was collected in 2021, a year that was dominated by global trauma and stress. Data collected through self-report during this time comes with its limitations, such as responses that can be influenced by unusal levels of stress and burnout and commonly found social desirability. Additionally, although the recruitment methods and design of the study aimed to ensure global perspectives, the participant sample is based on snowball methods and still largely derived from the United States. Therefore, it may not be representative of the broader population of criminal justice professionals, autistic individuals, and their families and carers, especially those less likely to be able to participate in research. Because professionals and other participants could choose to respond to the study, it is possible that the sample we received is biased and again, not representative of the broader community of stakeholders. Finally, our sample of autistic adults included those both professional diagnosed and those who self-identify as autistic. This decision was made as an acknowledgement of the inequalities that many countries face in accessing diagnostic and autism-related services (Bishop-Fitzpatrick & Kind, 2017).

Lessons Learned

Despite these limitations, we believe that the collaboration and stakeholder input make this global effort an important first step in better understanding the interactions between autistic individuals, their families, and the CJS. Because this was a global effort that was funded by a large international research organization, we believe it is important to reflect on the process of survey development and our "lessons learned." Most importantly, was the notable challenge of recruitment of a diverse sample. To achieve this goal, our survey workgroup included researchers from multiple countries (i.e., Australia, Ireland, & the US), parent representation, and practitioners (i.e., police officers) with diverse gender and ethnic representation. Importantly, the management of this team was coordinated by a single institution and project coordinator who identified ideal time zone overlap during waking hours (although not always during working

hours), and scheduled these meetings well in advance. From this group, we sought a level of community partnership at all research stages including developing the research questions and proposals, undertaking the research, and evaluating the findings. We learned, through our efforts, that social media (even for paid advertisements) was not a successful recruitment tool. Instead, word of mouth and personal requests supported dissemination of the survey more readily. Despite our level of community engagement and person requests, we still have a predominantly White, North American, sample that does not reflect the spectrum of individuals on the autism spectrum globally.

We believe that in future efforts of this kind, funding should be secured to support intentional and creative sampling that prioritizes diverse populations over those typically surveyed. Additionally, a strategic sampling technique (e.g., cluster sampling from various demographic areas or quote sampling) could be used to successfully gather a more diverse sample and perspectives. We recommend collecting data in multiple formats, as an electronic survey limits the sample to individuals who are privileged with access to technology. In reflection, a number of focus groups or round table discussions with participants may have provided a more diverse perspective and gathered feedback from individuals who were unable to access the electronic survey. A final barrier to participation could have been the length of our survey. We acknowledge the burden that many caregivers and family members feel when asked to complete yet another survey or assessment, a task that is all too familiar for a parent or caregiver of an autistic individual. We challenge research teams to find diverse and creative methods to take these barriers into account and gather data from participants in improved ways.

Acknowledgements The authors would like to gratefully acknowledge the members of the Global Criminal Justice Survey Workgroup who contributed to the design and creation of the Global Criminal Justice Survey. We would like to specifically acknowledge the contributions of Corporal. John T. Burke, Jr., Philadelphia Police Department who offered critical feedback and perspective as a police officer engaged in training and education.

Funding The development of this paper was supported by funding from the International Society for Autism Research (INSAR) to develop an INSAR Policy Brief on criminal justice and autism. However, that funding does not in any way constitute an endorsement of the contents of this paper, which have not been reviewed or approved by INSAR prior to its submission.

Declaration

Conflicts of interest There are no conflicts of interest to report

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