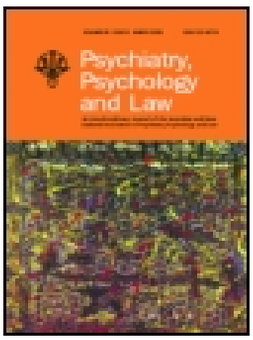

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The Scottish police caution: do individuals with intellectual disabilities understand a verbally presented police caution, and can comprehension be improved?

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This study considers comprehension of the Scottish police caution amongst people with an intellectual disability ($n = 30$). It applies techniques to the caution that are suggested to increase its 'listenability', to examine whether this could be a successful method of improving understanding. These techniques include providing instructions, further explanations and listing information. Half of the participants were assessed using the original version and half the modified version. Participants were assessed using an abbreviated IQ assessment, a measure of working memory and measure of state anxiety to consider potential predictors of performance. The modified version did not improve performance, with no participants judged to have adequate understanding in either version.

Keywords: common law caution; comprehension; intellectual disability; learning disability; police caution.

Introduction

In Scotland, under Section 3 of the Criminal Justice (Scotland) Act 2016, the police must inform a suspect of their right to remain silent prior to questioning and throughout legal procedures, a process known as cautioning (Police Scotland, 2015). Under the Act, the accused has the option to waive his or her right to silence and is only required to provide certain demographic information, such as their name and address (Section 34). A decision to waive these rights must be made in an *informed*, *voluntary* and *unequivocal* way, otherwise any provided information may not be admissible as evidence (Police Scotland, 2015, p. 9). Therefore, understanding caution wording is central to achieving these requirements.

An increasing body of empirical research, predominately conducted in the USA, Canada and UK, has considered caution intelligibility and has begun to question whether cautions are reliably communicating these rights as intended. Challenges in comprehension have been found amongst adults from general (e.g. Clare, Gudjonsson, & Harari, 1998; Hughes, Bain, Gilchrist, & Boyle, 2013; Patry, Connors, Adams-Quackenbush, & Smith, 2017) and higher education (e.g. Eastwood & Snook, 2009; Luther, Snook, MacDonald, & Barron, 2015; Scherr & Madon, 2012) populations. However, one group that has been repeatedly found to have the most considerable challenge are adults with an intellectual disability (ID; e.g. Everington & Fulero, 1999;

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Fulero & Everington, 1995; O'Connell, Garmoe, & Goldstein, 2005).

People with intellectual disabilities and police interviews

The accepted definition of ID requires an individual to have significantly impaired cognitive ability and adaptive behaviour, in comparison to the general population, with onset during the developmental period (World Health Organisation, 1992). It is suggested there is a 0.52% prevalence of ID amongst the general adult population in Scotland, which is likely an under-representative figure based on those known to local authorities (Scottish Commission for Learning Disability, 2017). This figure is also lower than the suggested prevalence amongst prisoners, where a UK study indicated figures ranging from 5% to 9.6% based on a screening measure (Murphy, Gardner, & Freeman, 2017). It is recognised that people with an ID often face challenges across the criminal justice system, for example a lack of modified questioning and comprehension checking in cross-examination, and poor evidence of attempts to build capacity to be able to take part in criminal procedures (Kebbell, Hatton, & Johnson, 2004; Salekin, Olley, & Hedge, 2010). This emphasises the need for ensuring services are considering potential vulnerabilities or disadvantages this population may face, in line with Scotland's current strategic drive (Scottish Government, 2013).

Research has indicated that people with ID are particularly vulnerable within police interviews, where the experience of stress in interrogation can negatively impact already impaired cognitive abilities (see Herrington & Roberts, 2012). People with ID, possibly because of reduced opportunities for self-direction and perceived power imbalances, are more likely to provide answers they believe are desired by an interviewer (Corby, Taggart, & Cousins, 2015; Goldsmith & Skirton, 2015), with a suggested bias toward responding in the affirmative when faced with uncertainty or complex communication (Finlay & Lyons, 2002), and avoidance of admitting a lack of knowledge or understanding (Herrington & Roberts, 2012). There is also perhaps a positive response bias to questions, even when question content is considered simple (Clare & Gudjonsson, 1993; Sigelman, Winer, & Schoenrock, 1982).

Some people with ID may be reluctant to share their diagnosis with police officers, possibly due to fear of stigmatisation or victimisation (Williams, Swift, & Mason, 2015). Therefore, to minimise potential vulnerabilities, it is important that people with ID are identified. However, identification is a task that police reportedly find challenging and often this does not occur until the individual has reached the police station, if at all (Parsons & Sherwood, 2016; Young, Goodwin, Sedgwick, & Gudjonsson, 2013). The accused may have already been verbally cautioned by this point, the primary method of communicating their rights, particularly in the community (Rogers et al., 2009).

Comprehending verbal communication

Comprehension of verbal information perhaps requires greater cognitive resource than written, due to the individual having reduced opportunity to review information and control pacing (Shohamy & Inbar, 1991). It is suggested that comprehension of verbal information requires a complex interaction of processes. There have been various conceptualisations regarding working memory and its relationship with short-term memory and further cognitive functions (Cowan, 2008). This study applies the idea that, at a minimum, working memory is not a separate capacity to short-term memory, and performance in related measures that require attention would be indicatory of the functioning of an individual's memory ability, at least due to attention affecting the ability to encode (Cowan, 2008).

Within the conceptual model of working memory (Baddeley & Hitch, 1974), it is theorised that verbally presented information

triggers the phonological loop, which is responsible for the temporary storage, processing and ordering of verbal information. It holds this in mind via rehearsal, either vocally or sub-vocally, but is limited in capacity (Baddeley, 2012). The central executive, which is presumed to manipulate attention, interfaces with prior developed verbal knowledge stored within longer term memory, to update and decipher meaning, as more information is communicated (Baddeley, 2012; Daneman & Merikle, 1996). The nature of verbal working memory being temporary and limited in capacity suggests that overload, via longer and/or complex words and sentences for example, puts greater pressure on capacity (Baddeley, 1994; Marton, Schwartz, Farkas, & Katsnelson, 2006). In ID, impaired working memory and, more specifically, challenge in this updating process, via attention control (Carretti, Belacchi & Cornoldi, 2010), will make processing verbal information more challenging. In considering verbal caution comprehension, the requirement of adequate cognitive resource appears to align with the reported findings that increasing cognitive ability, as assessed by IQ and verbal skills, are associated with caution understanding (e.g. Chaulk, Eastwood, & Snook, 2014; Cooke & Philip, 1998; Rogers, Gillard, Wooley, & Fiduccia, 2011). However, the potential role of working memory appears to be less explored, with one known study finding evidence of a possible association (Chaulk et al., 2014).

Attention control not only is presumed to be affected by an overload of information, but can also be disrupted via anxiety (Eysenck, Derakshan, Santos, & Calvo, 2007; Moran, 2016). The phonological loop, for example, may be specifically interrupted via worried inner self-talk (Rapee, 1993). A perceived threat, for example in police interrogation, may also direct cognitive resources away from the task of understanding and reduce the effectiveness and efficiency of cognitive processing (Eysenck et al., 2007). It should be noted that there remains a debate regarding the suggested impact of anxiety on performance in cognitive tasks, whereby it is suggested that performance may conversely be enhanced if the perceived threat is stimulated directly from the verbal information required to be interpreted (Eysenck et al., 2007). In the context of the caution, it may be suggested that anxiety would focus cognitive resources toward understanding the verbal communication, as the importance of comprehension could be considered a direct means of reducing perceived threat. On the other hand, the situation-driven anxiety of the interrogation process may hinder cognitive performance if it overwhelms the listener. Research thus far has indicated that anxiety, induced in a mock interrogation, has tended to further impair performance in caution understanding (Rogers, Gillard, et al., 2011; Scherr & Madon, 2012). This would tend to support the latter hypothesis regarding a negative impact of anxiety on ability to sufficiently apply cognitive resource toward understanding.

Considering complexity of the police caution

There are several elements typical of cautions that may influence cognitive burden and therefore reported understanding; these include:

- The length of cautions may be an influence (Rogers, Harrison, Shuman, Sewell, & Hazelwood, 2007; Rogers, Hazelwood, Sewell, Harrison, & Shuman, 2008).
- The element of choice over waiving one's rights typically occurs at the beginning of a caution. Therefore, to make an informed choice, the listener must retain this whilst processing subsequent information (Hughes et al., 2013).
- The language used in cautions is often complex, with some versions including language equivalent to that expected at a postgraduate level of education (Rogers et al., 2007, 2008).

- Cautions often contain words that are less commonly used outside the legal context, such as 'obliged' and 'bound' (Cooke & Philip, 1998; Rogers et al., 2007, 2008; Hughes et al., 2013).
- Cautions will often conclude with a closed question that asks if someone understands, only requiring a yes or no answer, which may increase potential for acquiescence (Cooke & Philip, 1998; Fenner, Gudjonsson, & Clare, 2002; Hughes et al., 2013).

Adequate comprehension of a verbally presented caution is therefore suggested to require considerable cognitive ability, which may prove challenging for people with impaired cognitive abilities, such as ID (Everington & Fulero, 1999; Fulero & Everington, 1995; O'Connell et al., 2005). This is before considering other influences that may further impact the individual's comprehension, such as stress of the interview, mood/emotions when being questioned, medication effects and their condition, for example if they are under the influence of alcohol/illicit substances or are experiencing active symptoms of mental illness (Rogers & Drogin, 2014; Rogers, Gillard, et al., 2011; Scherr & Madon, 2012; Viljoen, Roesch, & Zapf, 2002).

A lack of understanding, or this not being recognised by the interviewer, may prevent appropriate access to justice. The individual may be less likely to exercise their legal right and unfairly liable to making false confessions.

Improving caution comprehension

Some effort has been directed toward strategies to improve caution comprehension. Improvement has been found when reducing the volume of information to be retained, by assessing comprehension separately for each individual element of the caution, for example, as opposed to all at once (e.g. Clare et al., 1998; Shepherd, Mortimer, & Mobasheri, 1995). Another improvement was found when a written version of the caution complemented its verbal presentation, or was used instead (Eastwood & Snook, 2009; Hughes et al., 2013; Rogers, Rogstad, Steadham, & Drogin, 2011). These studies tend to include participants who are not identified as having an ID and/or would require the ability to read potentially complex language. It is also noted that initial cautioning is usually presented verbally (Rogers et al., 2007, 2009).

In targeting verbal presentation alone, a Canadian study assessed whether comprehension of a caution could be improved using less complex vocabulary (Eastwood, Snook, & Chaulk, 2010), but did not report significantly improved performance. Although techniques such as reducing the complexity of vocabulary and sentence length are typical methods employed to improve the readability of visual information, these may not, in themselves, translate to improving processing of auditory information (Rubin, 2012). Subsequent Canadian studies have since applied linguistic techniques to the caution, intended to improve the 'listenability' of the information (Eastwood & Snook, 2012; Snook, Luther, Eastwood, Collins, & Evans, 2016). This method considers the challenges of comprehending verbally presented information, for example not knowing when the communication will close, or having the ability to pace or read over what is being shared (Rubin, 2012). However, the modified cautions in the studies had more words overall (Eastwood & Snook, 2012; Snook et al., 2016). This potentially does create a conundrum, since it could place greater demands upon the listener in terms of processing a larger volume of communication and the subsequent impact of its maintenance within memory (Baddeley, 1994; Marton et al., 2006). Alternatively, it is suggested this method structures verbal information in a way that primes and supports the listener to organise and process it more efficiently. It does so by structuring spoken information with consideration of the 'linguistic and rhetorical structures' (Rubin, 2012, p. 178) employed by the

listener to make sense of information as it is received in the moment. This is particularly useful when the communication is not reinforced by written text, for example, which would afford opportunity to trace and re-read information. This thereby reduces the overall cognitive burden placed upon the receiver (Rubin, 2012).

The three listenability techniques used in the Canadian studies were instructions, listing and explanations. Instructions help make the listener aware of what to expect, and, in the context of the caution, it primes the listener toward being asked about what they have understood. Listing information into an explicit order helps the listener prepare for how many elements of information are expected within the exchange and to explicitly group these. Further explanations of each element then provide a second opportunity to determine meaning for each element, with alternative wording that may help mitigate challenges with understanding from initial phrasing. In the context of the caution, the wording of the explanation is typically considered less complex than that often found in the original versions (Eastwood & Snook, 2012; Snook et al., 2016). These modifications reportedly improved comprehension by up to 30% amongst the undergraduate university students taking part in the study (Eastwood & Snook, 2012), whilst remaining untested amongst people with an ID.

Study rationale

People with ID are over-represented within the criminal justice system in Scotland. This population experience significant challenges in comprehending a verbally presented police caution, likely due to its linguistic complexity and therefore the cognitive ability required to achieve understanding. This would be alongside vulnerabilities in police interrogation, including the impact of anxiety on functioning. The study intends to apply the listenability techniques of instructions, listing and explanations (Eastwood & Snook, 2012; Snook et al., 2016) to the Scottish police caution to determine whether these modifications increase comprehension amongst people with impaired cognitive ability. It will assess caution understanding by adapting previously developed methods (e.g. Cooke & Philip, 1998; Grisso, 1981; Olley et al., 1993). The method includes assessment of participant understanding following full presentation of a caution and then each of its individual elements separately, understanding of specific key words and finally whether sentences mean the same or something different to each element.

The primary study hypothesis is as follows:

1. The use of a modified version of the caution, using listenability techniques, will improve performance across each measure of comprehension.

The secondary hypotheses are:

1. Performance across each measure of comprehension will be positively correlated with IQ, across both the standard and modified cautions.
2. Performance across each measure of comprehension will be positively correlated with verbal working memory and verbal comprehension, across both versions of the caution.
3. Higher scores in state anxiety will be negatively correlated with caution comprehension across both versions of the caution.
4. There will be no association between participant-reported knowledge and actual performance in assessment of comprehension.

Method

Design

The study utilised a between-subjects design, with caution version as the independent variable and caution understanding as the primary outcome variable. The influence of

demographic and cognitive variables was examined through correlation analyses as a secondary element of the study.

Ethics

The project received ethical approval from the University of Edinburgh Health in Social Science Research Ethics Committee and adhered to required security policies. Participant consent forms were stored separately from anonymised data. Recordings were transcribed, anonymised and deleted following completion of the study. All participants were considered to have capacity to consent. The recruitment process was through Third Sector/Care Providers, who are familiar with individuals accessing their services and who would be likely to have capacity to consent. The lead investigator has experience working with people who have an ID and assessing capacity. Capacity was assessed by spending significant time going through the participant information sheet, clarifying any questions they had and asking the participant to describe the information in their own words. There was a particular focus on ensuring the participant understood this was a research study and they were not in any trouble, due to the topic being explored. They were made aware of their right to withdraw from the study at any time.

Inclusion criteria

Participants were required to have an ID, which is typically defined as global impairment in both intellect and adaptive functioning present from the developmental period (World Health Organisation, 1992). They were required to have an IQ between 50 and 70, but able to provide informed consent to taking part. They had to be aged 16 years or over and fluent in English. Exclusion criteria were: significant hearing impairment, current symptoms of psychotic illness, substance misuse, the presence/suspected presence of a progressive neurological disorder, or prior personal experience of being cautioned by the police.

Determination of sample size: power calculation

No prior studies have compared understanding of a modified (listenability) version of a caution against its standard presentation amongst ID participants. Therefore, to determine an appropriate sample size, a power calculation was completed informed by a similar study completed with university students (Snook et al., 2016).

An appropriate alpha (α) was determined by applying the Holm–Bonferroni method (Holm, 1979), to account for the family-wise error of completing multiple analyses. Four methods are used to make up the assessment of understanding (below); therefore the adjusted $\alpha = .0125$. The initial assessment method is participant understanding of the caution presented in full, which is the primary measure of understanding, and for which the results of the Snook et al. (2016) study had an effect size (d) of 1.02. A power calculation applied to these figures, using the G*Power calculator (Faul, Erdfelder, Lang, & Buchner, 2007, Version 3.1.9.2) at a power (β) of 80%, suggested a total sample size of 40 (two groups of 20) for an independent-samples t test.

Recruitment

The lead investigator attended various third sector events attended by Scottish organisations working with people who have an ID, as well as local advocacy groups to increase awareness of the project. Leaflets containing information for services and easy-read information for participants were provided, containing contact details of those involved in the study. An experienced speech and language therapist (SLT) reviewed the easy-read document and suggested appropriate modifications until it was considered appropriate for the intended audience. The SLT had both pre- and post-qualification specialist training in ensuring that communication methods are accessible to those with IDs. Those who wished to take part, or a nominated person, could then

make contact, to find out more about the study. The lead investigator then contacted the potential participant or liaised with relevant facilitator(s) from the services, to arrange initial meetings.

Recruitment presented challenges. Participants were not recruited at the point of attending events and groups, even if they expressed interest, as a means of reducing potential pressure on participants. This meant relying on the individuals to approach support staff or contact the lead investigator to take part. The process followed therefore meant only a proportion of those who were made aware of the project subsequently volunteered to participate. No record was kept of the number of potential participants that might have been known to the support staff, as this was not felt to be feasible.

Recruitment efforts were increased during the conduct of the study. This included extension to include a wider geographic area and approaching more services and organisations than had originally been envisaged. Email contact, including project information, was made with key individuals from 26 appropriate agencies that work with people with IDs, including follow-up telephone calls where possible. Telephone contact was made with a local college and regular meetings with a manager from local social services. Ultimately, Dumfries and Galloway Social Services and seven third sector organisations supported recruitment, over south Scotland and the central belt (City of Edinburgh, Dumfries & Galloway, East Dunbartonshire, East Lothian and Glasgow City). Approval for recruitment was achieved from relevant managers within these services.

Consent and participant wellbeing

Capacity to consent was an inclusion criterion for the study and was reviewed by the lead investigator throughout the recruitment and assessment process. The police caution may have been considered a sensitive topic for some individuals, therefore participants were reminded it was only read as part of the study, both at consent and at debrief. No participants indicated or verbalised they were uncomfortable or worried about participating, including when this was asked explicitly. The lead investigator did not observe any behaviour they considered suggestive of discomfort, either verbally or non-verbally.

Development of the standard and modified cautions

Various steps were taken to ensure that a representative current version of the caution was used in the study and that the application of listenability techniques was appropriate.

Standard caution

There is no specified wording for communicating interrogation rights in Scotland. Therefore, the lead investigator communicated with Police Scotland to request recommended wording (M. Rendall, personal communication, February 10, 2016). The response provided direction to the common law caution as provided in the Police Service of Scotland Solicitor Access Guidance Document (Police Scotland, 2015). It was decided a theft would be used as the participant's hypothetically accused crime in the study, as this was considered to have less strong emotive connotations than other crimes, such as physical violence.

The caution was divided into four distinct elements, as used for assessment, and was: *I am now going to ask you questions about [the theft], (1) you are not obliged to answer any questions, (2) but anything you do say may be noted, may be audio and visually recorded, (3) and may be used in evidence. (4) Do you understand that?*

Modified caution

In the development of the modified version, the lead investigator first applied the listenability (instructions, listing and explanations) techniques (Eastwood & Snook, 2012) to the common law caution. Two clinical psychologists experienced in assessing medico-

legal opinions on the fitness of individuals with IDs to be interviewed by police, then reviewed the wording and suggested minor changes. The lead investigator then liaised with a specialist speech and language therapist, who checked adherence to the listenability techniques and suggested areas for improvement, which were applied collaboratively. A lawyer specialising in criminal defence work then reviewed the final amended version and stated that this version covered the rights appropriately. The modified version did contain considerably more words (204) than the original (41); however, this was also the case in the original studies applying the listenability technique to cautions (Eastwood & Snook, 2012; Snook et al., 2016).

The final modified caution with its corresponding four parts was: *I am going to tell you the police caution. The police caution tells you about what you can do when being interviewed by the police. I want you to listen carefully to the caution as I say it. I want you to think about the information that you hear. This is important, as I will ask you to tell me what the caution means when I finish saying it. I will tell you the caution now.*

I am going to ask you questions about [the theft]. There are three things that you need to know about. (1) First, you are not obliged to answer any questions. This means that you can choose. You can choose to answer questions, or you can choose not to answer questions. You can decide. (2) Second, anything that you say may be noted and may be audio and visually recorded. This means what you say might be written down, your voice may be recorded speaking, or a video camera may record what you say and do. (3) Third, this may be used in evidence. This means what you tell me may be used for or against your case. (4) Do you understand that? … Can you tell me about what I have just said?

Assessment of caution comprehension

Three questions were asked pertaining to participants' prior knowledge of interrogation rights at police questioning. A brief scenario was provided where a male was questioned by the police after throwing a brick through a window, with a visual cartoon image of the suspect, John, and a policewoman. The three questions were: (a) *Does John have to tell the policewoman about what happened?* (b) *Will John get in more trouble if he says nothing?* (c) *Will the policewoman write down what John says to her?* This assessment was added after two initial participants had completed the experimental protocol.

Table 1 contains an overview of the method used to assess participant caution comprehension, informed by prior study methods (Cooke & Philip, 1998; Grisso, 1981, 1986; Olley et al., 1993). The lead investigator transcribed all session recordings verbatim. A scoring rubric was developed and applied to score the transcribed responses, which was reviewed by a member of the research team.

Materials

Demographic information

Participants were verbally requested to provide information relating to their age, gender, level of support required in daily living, and current employment status.

Assessment of state anxiety

An amended Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), with wording considered appropriate for individuals with an ID, was used (Dagnan et al., 2008). This included a visual representation of answer options to further assist participant understanding (Shackleton, 2017). Only those questions pertaining to anxiety were included, which left seven questions, rated from 0 to 3 (*not at all* to *very much*). The scale had a maximum score of 21, where higher scores indicated greater state anxiety. In considering the internal reliability of those questions pertaining to anxiety, Dagnan et al. (2008) found that the scale had an alpha coefficient of .85. There is no known

Table 1. Scoring in assessment of caution knowledge.

Method	Presentation in assessment	Scoring	Maximum score
Understanding of caution presentation in full	Participant asked to explain meaning of caution presented in its entirety.	For each element (2) Full understanding (1) Partial understanding	8
Understanding of elements	Participant asked to explain meaning of each element presented individually.	(2) Full understanding (1) Partial understanding	8
Definitions	Participant asked to explain meaning of four key words from the caution (obliged, audio recorded, visually recorded, evidence).	(2) Full understanding (1) Partial understanding	8
Same/different	Participant asked to decide whether a presented sentence means the same or something different to each element. There is one sentence that means the same and one that means something different for each element.	For each element (2) Correctly identifies the sentence that means the same *and* the sentence that means something different. (0) If only identifies one correctly, or both incorrect.	8
Total			32

published data on the validity of these modified questions for this population.

Assessment of intellectual functioning

The Wechsler Abbreviated Scale of Intelligence (Second Edition, WASI–II) Two-Subtest Version (Wechsler, 2011) was used to indicate cognitive functioning. The authors suggest adequate reliability for the Vocabulary (verbal comprehension; $r = .92$) and Matrix Reasoning (perceptual reasoning; $r = .90$) subtests and overall Full-Scale Intelligence Quotient (FSIQ; $r = .94$). The authors suggest that the two-test version correlated moderately ($r = .84$) with the non-abbreviated Wechsler Adult Intelligence Scale (Fourth Edition; WAIS–IV; Wechsler, 2008). The assessment was used to consider any relationship between IQ and caution understanding, but also as a screener of ID.

Assessment of verbal working memory

The Digit Span subtest of the WAIS–IV (Wechsler, 2008) was used as a measure of an aspect of working memory, the phonological loop. The validation process of the WAIS–IV included people with ID. The factor loading, when considering the full standardisation sample, suggested an intercorrelation with the working memory construct of .76. Wechsler (2008) also describes the Digit Span test to have good test–retest stability ($r = .82$).

Procedure

Assessments took place within a quiet room. The location, such as a local community resource centre, was arranged with the participant or someone who supported them. If a mutually convenient location could not be arranged, the lead investigator would complete assessments at the participant's home. Five participants were assessed at home, with risk

assessments completed in advance. Participants were given the opportunity to have a second person with them in assessment. This person could not be planning to participate in the study and was requested to remain silent throughout assessment. Four participants elected to have someone join them.

The lead investigator completed all assessments. This began with the participant information sheet being read through, to ensure understanding of the study aims and process. The participant consent form was then reviewed and signed by the participant and lead investigator.

Participants were randomly assigned to either the standard or modified caution group using a random number generator (Haahr, 1998). Initially, this was planned for a full set of 40, in accordance with the power calculation; however, due to apparent challenges in recruitment, this was then calculated for sets of 15. The relevant administration protocol procedure was then followed. Demographic information was first gathered, followed by the measure of situational anxiety and assessment of prior knowledge of the caution. The audio recorder was then started, and the participant was reminded that this section of the assessment would be recorded. The participant was first informed that as part of the study, they were to pretend the police thought they had stolen a handbag, then the caution was read aloud, and all questions were asked verbally. The protocol permitted enthusiasm and praise for the participant effort and avoidance of comments on performance, as informed by the WASI–II administration manual (Wechsler, 2011). Prior to switching off the audio recorder, the participant was asked whether they had heard something like the caution before. If the participant tried to share direct personal experience of being cautioned, they were stopped, and this was not discussed further.

The WASI–II and digit span were then completed, prior to debrief. Debrief involved sharing the purpose of the study, checking participant wellbeing and opportunity for questions. No individual indications of performance were provided to participants. Full procedure completion time was around 45–60 min.

Sample characteristics

A total of 33 people participated; however, two were removed prior to analyses due to having personal experience of being cautioned, and one because their IQ exceeded 70. Table 2 contains demographic data and cognitive and mood measures. No statistically significant differences between groups were found, suggesting that the groups were equivalent on the key variables of interest.

Scoring check of recall and comprehension of cautions

An assistant psychologist independently rated 10 randomly selected participant transcriptions as a validity measure of the scoring method for caution comprehension. The same/different assessment was removed from analysis of agreement, due to being closed questions that achieved perfect agreement, which would skew overall scoring. Cohen's κ indicated this agreement was moderate, $\kappa = .75$, $p < .001$ (McHugh, 2012), with a comparable figure to that from previous studies using a similar method (e.g. Eastwood et al., 2010; Freedman, Eastwood, Snook, & Luther, 2014). The lead investigator and assistant psychologist jointly considered discrepancies and decided final scores prior to analyses. There were no common discrepancies, and all were differences between ratings of 1 or 2.

Results

Recall and comprehension of cautions

As can be seen in Table 3, participants had considerable difficulty understanding both versions of the caution, throughout all methods of assessment. This was particularly evident in assessed understanding following full presentation, where most participants (80%)

Table 2. Participant descriptive data and comparison between caution versions.

	Standard group ($N = 15$: 11M: 4F)		Modified group ($N = 15$: 8M: 7F)		Group comparisons ($\chi^2(1) = 2.20$, $p = .138$)			
	Mdn	*IQR*	*Mdn*	*IQR*	*U*	*z*	*p*	*r*
Age	4	33–51	41	31–53	108.50	−0.17	.868	−.03
Support hours (per week)	10	1–30	4	0–10	79.50	−1.38	.169	−.25
State anxiety score (out of 21)[a]	3	2–4	4	2–5	86.00	−1.12	.265	−.20
Full-scale IQ (2 subtest)	59	57–64	62	59–66	79.00	−1.40	.162	−.26
Vocabulary subtest (raw score)	19	16–21	19	17–21	102.5	−0.42	.677	−.08
Matrix reasoning subtest (raw score)	6	5–8	7	5–9	89.50	−0.97	.334	−.18
Digit span (raw score)	13	10–17	19	13–19	79.50	−1.37	.170	−.25

Note: IQR = inter-quartile range; *U* = Mann–Whitney *U*; M = male; F = female.
[a]A higher score indicates increased anxiety.

Table 3. Comparison of scoring between cautions.

	Standard caution ($N = 15$)		Modified caution ($N = 15$)		Difference			
	Mdn	*IQR*	*Mdn*	*IQR*	*U*	*z*	*p*	*r*
Full presentation (out of 8)	0	0–0	0	0–1	97.00	−0.92	.357	−.17
Understanding of elements (out of 8)	3	0–4	2	1–4	112.00	−0.21	.983	−.04
Definitions (out of 8)	2	0–3	3	2–5	80.50	−1.36	.173	−.25
Same/diff (out of 8)	2	2–4	2	2–4	106.00	−0.29	.772	−.05
Total (out of 32)	9	3–11	8	5–8	102.00	−0.44	.66	−.08
Self-reported understanding	N=15, 100%		N=15, 100%					
Questioning of understanding	$N = 1$, 6.67%		$N = 3$, 20%					

Note: IQR = inter-quartile range; *U* = Mann–Whitney *U*; *N* = sample size.

Table 4. Participant prior experience and prior awareness of caution elements.

	Yes		No	
	N	%	*N*	%
Previously heard caution	23	77	7	23
where:				
television	20	87		
someone else	1	4		
unsure	2[a]	9		
Prior knowledge				
(1) John will have to tell police	25	83	5	17
(2) More trouble if says nothing	25	83	5	17
(3) Policewoman write down what is said	28	100	0	0

Note: *N:* sample size.
[a]They had not themselves been cautioned at any time previously.

scored 0. There were no significant differences between scoring on all methods of assessment, regardless of caution version. Despite poor performance, all participants reported they had understood the caution. Only four participants indicated they were unsure to any extent (e.g. '… it's a bit complicated', 'I think so'), but when requested to decide yes or no, they all opted for yes.

Prior hearing of caution and prior knowledge

Most participants reported hearing the words of the caution, or similar, before, most typically from television (Table 4). If participants answered yes to hearing the caution, or something similar to this before, they were then asked where they had heard this previously, using an open question format. In the given hypothetical scenario, where a man had been questioned by a policewoman after throwing a brick through a window, participants evidenced a lack of knowledge, except that the policewoman would write down what the accused had said (Table 4).

Post hoc consideration of assessment method

There was no statistically significant difference in participant performance between the standard and modified versions of the cautions; therefore the groups were collapsed, and subsequent analyses of assessment methods were considered across the entire sample.

It was apparent that performance significantly improved when participant understanding of the individual caution elements were asked separately ($Mdn = 2.5$), as compared to the caution in full ($Mdn = 0$), $z = -4.13$, $p < .001$, $r = .75$.

The highest scoring (range = 0–2), on average, for defining key words was for audio recorded ($M = 0.87$), then evidence ($M = 0.73$), visually recorded ($M = 0.5$), and finally obliged ($M = 0.23$).

Consideration of potential predictive variables on understanding

Table 5 contains the associations between the dependent variables and performance across the assessment methods. This was completed using the full sample (both groups collapsed together). To account for the number of correlations and therefore potential family-wise error rate, a Holm–Bonferroni procedure was followed (Holm, 1979). From this, vocabulary remained a significant positive correlate for definitions and understanding of elements. Age was a significant negative correlate for understanding of elements.

Discussion

The primary aim of the study was to establish whether the application of listenability techniques to a verbally presented caution in Scotland would improve comprehension amongst people with an ID. However, the study failed to replicate findings of similar Canadian studies amongst student samples (Eastwood & Snook, 2012; Snook et al., 2016), where a significant positive effect was found.

It is possible this lack of an effect is due to the increased volume of words contained within the modified version, when compared to the original version (204 vs. 41). This may in itself demand too much of the listener with regard to processing and manipulating the communicated information (Baddeley, 1994; Marton, Schwartz, Farkas, & Katsnelson, 2006). It is possible the listenability techniques fail to adequately mitigate this challenge for people with an ID. The refreshing process of working memory, for example, is considered to be more impaired amongst people with an ID, when performance is compared to that of a sample of fluid-intelligence-matched, typically developing children (Carretti et al., 2010). Therefore, the intended impact of the listenability informed techniques, which required an increase in the volume of verbal information, may continue to overwhelm the listener due to a delayed updating process. In addition, the techniques used may not have had the same intended impact, for example explanations may not provide the intended benefit of repeated exposure. This is suggested because, as suggested from participant performance in the original version, the wording of the original version was too complex for this population to understand anyway, as the initial exposure. This could make it redundant, yet the listener would continue to expend cognitive resource toward trying to make sense of it. Within the published literature, the impact of these techniques on comprehension of verbal communication remains unexplored through empirical study, when specifically considering people with ID. This suggests that further work on this area, with this population, is required.

The poor performance across participants in this study is stark. There was evidence of floor effects across both versions of the caution, where almost everyone scored zero on understanding of the caution presented in full, and no-one was assessed as providing an adequate description of all four elements, even when each was presented individually. Poor performance is reflective of earlier studies of caution comprehension amongst people with ID (e.g. Everington & Fulero, 1999; O'Connell et al., 2005) and suggests there is a fundamental problem with communicating this information verbally.

Although performance remained poor when the caution elements were presented and assessed separately over both versions, it was significantly better than when these were presented in their entirety, as found in prior studies (e.g. Clare et al., 1998; Shepherd et al., 1995). It may be the result of practice effects or instead indicate that some people can potentially grasp concepts of the caution, when the overall load of information is reduced (Baddeley, 1994; Marton et al., 2006). More specifically, it is possible the caution may be understandable to a greater number of people with ID, but to achieve this it needs to be presented differently.

In considering the key words of the caution, on average participants scored best on audio recorded and poorest for obliged. In the Cooke and Philip (1998) study of offender understanding, they found the word tape-recorded was considerably better understood than obliged, which is a similar finding.

The secondary aim of the study was to explore possible predictors of caution comprehension. Performance in understanding of the elements tended to deteriorate as age increased, and this differs from results of other studies amongst adults, where performance across assessments has not shown any association with age (e.g. Frumkin, Lally, & Sexton,

Table 5. Consideration of associations between sample characteristics and caution comprehension.

	Full presentation		Elements		Definitions		Same/different		Total score	
	τ_b	p	τ_b	p	τ_b	p	τ_b	p	τ_b	p
Age	−.33	.031	−.41[a]	.003	−.31	.027	−.11	.463	−.33	.012
State anxiety	.07	.657	−.02	.912	.06	.681	−.02	.876	−.01	.956
Full-scale IQ (2 subtest)	.04	.776	.10	.475	.20	.165	.00	1.00	.11	.438
Vocabulary subtest (raw score)	.33	.032	.39[a]	.006	.48[a]	.001	.11	.473	.34	.01
Matrix reasoning subtest (raw score)	.09	.549	.14	.319	.14	.333	.17	.329	.170	.217
Digit span (raw score)	.09	.519	.10	.519	.28	.051	.14	.343	.24	.072

Note: τ_b=Kendall's tau.
[a]Significant at p-level, as corrected for multiple comparisons.

2012; Viljoen et al., 2002). The reason for this association is unclear, although – speculatively – may be reflective of deteriorating verbal memory as people age (Davis et al., 2003; Park et al., 2002), which is perhaps more marked in ID where baseline cognitive function would typically be lower (Burt et al., 2005). However, it is acknowledged that this is purely supposition at this point. The finding that assessed skills in vocabulary were positively associated with performance in understanding of elements and definitions was expected, as the method used to assess comprehension is essentially measuring vocabulary skills. However, it does add to the study method's validity as it matches findings of prior studies (e.g. Chaulk et al., 2014; Cooke & Philip, 1998; Fulero & Everington, 1995) and makes intuitive sense. Presumably the individual must have adequate ability in verbal skills, before other cognitive abilities can enhance performance in understanding (Rogers et al., 2009). Participant scoring on digit span (a measure of verbal working memory), state anxiety, IQ and matrix reasoning (a measure of perceptual reasoning) had no significant association with performance in this study.

Participant-reported understanding

All participants claimed they had understood the caution, when asked using a closed question. It is possible that a familiarity with the wording, from reported exposure in popular media, has misled participants into thinking they understand (Chaulk et al., 2014; Nguyen, 2000). Prior research has also indicated that people with ID are more likely to respond affirmatively to posed questions (Clare & Gudjonsson, 1993; Sigelman et al., 1982), particularly if they do not understand information being communicated (Finlay & Lyons, 2002). In the study context, this acquiescence may result in an individual proceeding to be questioned by police, a potentially distressing experience, whilst they did not understand their communicated rights. This may be unfair

and therefore discriminatory to the suspect. It will risk gathered evidence from interviews being considered inadmissible (Cooke & Philip, 1998; Fenner et al., 2002). If misunderstanding is later recognised, the requirement of further assessment, and possible dismissal of cases, may delay judicial processes. Further, not understanding this right may result in the sharing of potentially incriminating information, whilst not recognising one's *privilege against self-incrimination* (Scottish Government, 2012). A person considered to hold greater cognitive ability may benefit from the ability to be more selective in the information they share.

Study limitations

Study findings must be considered carefully, as the sample size was less than the suggested figure achieved from a power calculation. This was despite increased recruitment efforts, such as widening the geographical area covered and number of services approached. These challenges are common in research with people with ID, particularly due to necessary ethical processes and indirect access to participants (Cleaver et al., 2010). Therefore, it is possible there are small effects between the caution versions, but given the limited number of people who participated in this study, the likelihood of detecting any effect was considerably reduced.

The study procedure used the WASI–II (Wechsler, 2011) as a screening measure of ID and did not include the full assessment required for classification. However, the use of this screening measure and the recruitment method, through services for people with ID for example, was considered adequate for the purposes of this study, whilst it ensured appropriate assessment duration for participants. It is acknowledged that the assessment of verbal working memory, using a verbally presented digit span test, is a limited measure of the phonological loop, which restricts conclusions that can be drawn about verbal memory. Research has also indicated that the contribution of the phonological loop to auditory comprehension is perhaps more limited than the influence of the central executive. Therefore, future research may benefit from including a measure of central executive functioning (Chrysochoou & Bablekou, 2011).

The method of assessing caution understanding was adapted from prior study methodologies. However, it is acknowledged there are limits to this. There are multiple opportunities to display understanding as the caution is read repeatedly and assessed in various ways, for example, albeit without feedback, which could lead to practice effects. To minimise this potential influence, the order of each assessment method was intentional, for example the same/different assessment was kept as a final measure of knowledge, as potential answers are provided by the lead investigator that could inform subsequent responses. It could also be argued that assessment through a description of perceived understanding may not always be the most helpful indicator of actual understanding, as non-reporting may not always reflect a lack of understanding in an element (Chaulk et al., 2014). But again, even with the multiple methods of assessment, overall understanding was markedly low.

The experimental method took care to ensure that participants felt comfortable in assessments. This included opportunity to participate at a time suitable to their commitments. However, this likely reduced ecological validity. Further, a small number of participants were tested at home or chose to have a support worker present in the room, which may have affected performance. Disparate sample sizes for each context provided inappropriate data for statistical analysis. The real-life experience of being arrested by a police officer would presumably be anxiety provoking and therefore impact processing of information (Eysenck et al., 2007; Moran, 2016). Self-reported state anxiety was low in the study and was not found to be associated with performance in

assessment of caution comprehension. However, the adapted assessment used has not been appropriately validated. It is also based on self-report, which is known to under-represent experience, more so when considering people with ID who may struggle to understand the included concepts (Emerson, Felce, & Stancliffe, 2013).

Implications and future directions

The findings of this study are reflective of those before it, which repeatedly indicate limited understanding of cautions amongst various study samples. This raises the question of whether a verbally presented caution fulfils its intention of making the accused aware of their interrogation rights. Perhaps controversially, some authors have argued that miscomprehension could be considered a benefit to interrogators, with the suggestion that police may present the caution as though it is a mere procedure that can be run through quickly (DeClue, 2007; Feld, 2013; Gudjonsson, 2003, pp. 48–49). This was experimentally considered with American students, whereby a waiver decision was presented to hold either important or trivial consequences (Scherr & Madon, 2013). Those participants who had it presented as trivial were more likely to waive their rights but were also assessed as having poorer performance in assessed understanding of the caution.

One further concern is using a closed question to check comprehension. Every participant claimed to understand the caution in the study, but all participants were considered to perform poorly in assessment. Therefore, more effort should be directed, as part of standard procedure, to further verify comprehension, such as asking the individual to explain their understanding of the caution (Fenner et al., 2002; Snook et al., 2016).

Police should be encouraged to identify people with ID, as the study suggests this population is vulnerable to misunderstanding the caution. However, studies have indicated identification as something police have difficulty with (Parsons & Sherwood, 2016; Young et al., 2013). Therefore, training efforts should be directed to improving awareness and confidence amongst officers. This could assist recognising potential indicators of ID and encourage asking the accused about possible presence of ID, to help mitigate potential problems.

Future research efforts could consider the apparent negative association with age, to decipher whether it is an ID-specific association or merely a spurious finding of the study. The development of an assessment that explores understanding of the implications of wavering one's rights in Scotland may also be useful. Further consideration of other methods that may improve comprehension for people with ID is encouraged, for example the use of easy-read material (see Parsons & Sherwood, 2016) or development of resources that apply well-considered visual communication methods (Cameron & Matthews, 2017). Research with this population is recommended, as the relationship between assessed caution comprehension and verbal abilities would indicate that improvements in comprehension would benefit a wider range of individuals.

Conclusion

This study demonstrated that a sample of individuals with mild-to-moderate ID struggled to understand a version of the police caution as presented in Scotland, under optimal assessment conditions. This was despite self-reports of understanding. This was not improved by applying listenability techniques that have evidenced a positive effect on comprehension amongst a sample of university students. There was a positive association with performance on assessment of comprehension with verbal ability (as assessed by vocabulary) and negative relationship with age. Significant efforts are required to ensure that this population are not disadvantaged within the criminal justice system due to their disability (Scottish

Government, 2013). Hence, continued work on increasing the accessibility of the caution is necessary. This may be supplemented by ensuring that police officers and other professionals within the criminal justice system are aware of the needs of individuals with IDs that they may encounter.

Ethical standards

Declaration of conflicts of interest

Michael Rendall has declared no conflicts of interest
Ken MacMahon has declared no conflicts of interest
Bruce Kidd has declared no conflicts of interest

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, University of Edinburgh Health in Social Science Research Ethics Committee, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Data availability statement

The data that support the findings of this study are available from the corresponding author, Michael Rendall, upon reasonable request.

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