Influences on understanding of a verbally presented police caution amongst adults involved in the criminal justice system: a systematic review

Michael Rendall^{a,b} and Ken MacMahon^{b,c}

^a*Intellectual Disability Psychology Service, NHS Dumfries and Galloway, Dumfries, UK;* ^b*Section of Clinical and Health Psychology, School of Health in Social Science, University of Edinburgh, Edinburgh, UK;* ^c*Psychological Services, NHS Ayrshire & Arran, Irvine, UK*

This review systematically examines the literature exploring comprehension of a verbally presented police caution and the suggested factors influencing this, amongst adults within the criminal justice system. An electronic literature search returned 438 titles, with screening leaving 13 articles considered appropriate for the review question. The majority of these were USA studies, with two UK and two Canadian studies. Heterogeneous study methodologies permit only a narrative approach to pooling the data. Findings indicate that a considerable proportion of this population have difficulty fully understanding the caution. Higher IQs and verbal comprehension are positively associated with performance. The studies also indicate that some factors that may appear intuitively related to comprehension, such as prior caution exposure, education, age and mental health, may not be linked to performance. The literature generally used broad inclusion criteria, which increased potential for confounders and reduced opportunity to draw out probable predictors.

Keywords: comprehension; interrogation rights; Miranda rights; Miranda warnings; offenders; police caution; suspects.

Introduction

Many countries require police to provide a caution to suspects regarding their legal rights upon interrogation (The Law Library of Congress, 2016). Although specifics can vary, certain rights remain generally consistent across jurisdictions and typically include a right to remain silent and access to legal counsel (The Law Library of Congress, 2016). The consequence of choosing to waive these rights can differ, for example inferences cannot be drawn from an individual electing to remain silent in Scotland, but can in England and Wales (Carloway, 2012). Prompt delivery of the caution is often required, typically at the

time of arrest; however, this can vary by jurisdiction. It may be repeated or delayed until questioning at the police station and at any subsequent interviews (The Law Library of Congress, 2016). The delivery is typically oral and/or written, more often orally if an arrest is being made within the community, for example (Rogers, Harrison, Shuman, Sewell, & Hazelwood, 2007; Rogers et al., 2009).

There have been several high-profile cases where later discovery of a misunderstanding of rights, even if that person claimed understanding at the time of cautioning, has led to obtained information being dismissed in court (Kaempf & Pinals, 2008). One particularly

Correspondence: Michael Rendall, NHS Dumfries & Galloway, Mountainhall Treatment Centre, Bankend Road, Dumfries, DG1 4AP, UK. Email. michael.rendall@nhs.net

renowned case is *Miranda v. Arizona* (1966), where Ernesto Miranda had been charged and sentenced to prison following conviction for rape and kidnap. The Supreme Court ruled the case required retrial, where Miranda's signed confession was dismissed after it was concluded his rights had not been adequately explained and therefore excluded him from his right to avoid giving self-incriminating evidence. The US Supreme Court maintained that a suspect's waiver of rights can only be made if they are considered to have done so 'voluntarily, knowingly and intelligently' (*Miranda v. Arizona*, 1966, p. 444). Miranda was ultimately convicted in re-trial, where the prosecution was based on evidence that did not include the confession.

Ryba, Brodsky, and Shlosberg (2007) suggested that individual characteristics and situational variables should be considered when determining whether it would be appropriate to assess an individual's comprehension of their interrogation rights. They referenced a list of individual characteristics as described in *Coyote v. United States* (1967) that include 'age, intelligence, education [and] experience with the criminal justice system' (p. 301). It is believed that these factors continue to be considered in related decision making (Rogers, Harrison, Hazelwood & Sewell, 2007; Rogers, Rogstad, et al., 2010), even though the cited characteristics were not based on empirical evidence (Ryba et al., 2007).

Assessment methods in assessment of caution comprehension

Several methods have been developed to assess understanding of cautions, such as Grisso's Instruments for Assessing Understanding and Appreciation of Miranda Rights (GMI; Grisso, 1981, 1986), the Comprehension of Caution Test (CoCT; Cooke & Philip, 1998), Miranda Rights Comprehension Instruments (MRCI; Goldstein & Goldstein, 2010; Goldstein, Zelle & Grisso, 2012, 2014) and the Standardised Assessment of Miranda Abilities (SAMA;

Rogers, Sewell, Drogin, & Fiduccia, 2012). These tools use various means of assessing comprehension, often with consistent assessment features, and then apply a scoring rubric to assess performance. The caution may be read in full and then/or each of its elements, with comprehension being assessed through paraphrasing or free recall. These may be presented in combination with a written version. Definitions of common legal words that may feature in a caution are often assessed. Finally, individuals may be asked whether a sentence means the same or something different to each element, as a means of assessment that does not require independent generation of a verbal response. These tools are often used by forensic practitioners, for example, to aid legal competency assessments (Ryba et al., 2007), and studies have used these tools to consider understanding within various populations.

Empirical studies looking at caution comprehension

The degree to which cautions are understood amongst members of public has received empirical attention within recent decades, predominately within the UK, Canada and the USA. A Scottish study by Hughes, Bain, Gilchrist, and Boyle (2013), for example, considered understanding amongst a sample of the general population. Only 5% of their sample was considered to understand a verbally presented caution in full, despite 95% of participants claiming such comprehension. Similar findings have been found within other general population samples (e.g. Clare, Gudjonsson, & Harari, 1998; Fenner, Gudjonsson, & Clare, 2002; Patry, Connors, Adams-Quackenbush, & Smith, 2017), as well as amongst higher academic achievers (e.g. Davis, Fitzsimmons, & Moore, 2011; Eastwood & Snook, 2009; Snook, Luther, Eastwood, Collins, & Evans, 2016). Some specific groups have been found to struggle notably in assessment of caution comprehension, such as juveniles (e.g. Colwell et al., 2005; Frumkin, Lally, & Sexton, 2012; Zelle, Romaine, & Goldstein, 2015) and adults

with an intellectual disability (e.g. Everington & Fulero, 1999; Fulero & Everington, 1995; O'Connell, Garmoe, & Goldstein, 2005).

It may be assumed that a person who has either been convicted or questioned in relation to a potential crime, and hence been cautioned, would be likely to have a sound understanding of its meaning. However, several studies have demonstrated that, even amongst this group, there is only a limited understanding of the underlying meaning of the caution (e.g. Chaulk, Eastwood, & Snook, 2014; Rogers, Harrison, Hazelwood, et al., 2007; Viljoen, Roesch, & Zapf, 2002).

Language comprehension

To understand information presented verbally, the listener must hold the information being communicated in mind, something that may be achieved via rehearsal within the phonological loop of verbal working memory (Baddeley & Hitch, 1974). The central executive is then theorised to direct attention to the salient information and access verbal knowledge, as stored in long-term memory, to make sense as relevant (Baddeley, 2012). However, the amount and pace of information being communicated may vary, and the listener may not have control or be able to predict this. Therefore, to determine the meaning of the caution, a complex, bi-directional and active process is required to modify the essence of the communication as information increases (Baddeley, 2012; Ferreira & Patson, 2007). It is suggested that if the information being communicated contains complex language or is large in quantity, this can lead to cognitive overload and therefore misinterpretation or misunderstanding (Baddeley, 1994; Marton, Schwartz, Farkas, & Katsnelson, 2006).

Comprehension of a verbal caution

Several factors may increase the complexity of cautions and therefore the cognitive skill required to achieve adequate understanding. This includes the complexity of vocabulary,

which can include words that usually require a higher level of education to understand (Rogers & Drogan, 2014; Rogers, Harrison, Shuman et al., 2007; Rogers et al., 2008) and are not often heard outside legal contexts (Cooke & Philip, 1998; Hughes et al., 2013; Rogers, Harrison, Shuman, et al., 2007; Rogers et al., 2009). The length of cautions can vary significantly and often exceeds suggested listening capacity limits (Rogers, Harrison, Shuman, et al., 2007; Rogers et al., 2008). The element of being able to choose whether to waive interrogation right(s) is often stated at the beginning of a caution and therefore requires one to retain that option whilst making sense of the subsequent complex information being communicated (Hughes et al., 2013).

These factors may explain why the findings of studies that consider cognitive ability in caution comprehension have repeatedly pointed to a relationship between caution comprehension and intelligence and verbal abilities in adults (Hughes et al., 2013; Rogers et al., 2008) and young people (e.g. Cooke & Philip, 1998). Chaulk et al. (2014) also found an association with working memory within an adult sample. There has also been some mixed evidence that mental illness can impair performance in assessment of caution comprehension (e.g. Cooper & Zapf, 2008; Rogers & Drogan, 2014; Rogers, Harrison, Hazelwood, et al., 2007; Viljoen et al., 2002), where mild to moderate effects are suggested amongst the most severely impaired (Rogers & Drogan, 2014).

Relevant offender characteristics

It is arguable that certain characteristics commonly found amongst offenders indicate impairment in the suggested capacities required to understand a verbal caution. A UK review suggested that around 50–70% of offenders had no qualifications and literacy skills within the lowest range of a national standardised framework (Clark & Dugdale, 2008). It is also estimated that the prevalence

of people with intellectual disabilities may be disproportionately higher than in the general population, up to 9.6% (Murphy, Gardner, & Freeman, 2017). Mental illness is a significant problem amongst prisoners, with psychosis and major depression being particularly prevalent when compared to general population figures (Fazel & Danesh, 2002).

Rationale

It is well established that adults with intellectual disabilities are significantly impaired when it comes to understanding the caution. However, it is helpful to empirically consider other variables that may influence comprehension and are important to be aware of. Therefore, the review excludes people with intellectual disabilities to ensure significant impairment of IQ does not overwhelm other characteristics that might be of relevance. The review considers the literature assessing this within a single population: adults within the criminal justice system (i.e. suspects and offenders). This population was selected given the practical relevance of examining the group for whom the caution is intended. It is also a group within which various characteristics exist that are possibly contributing to performance in assessment of caution comprehension.

Aims

The aim of this systematic review is to assess the evidence base on factors that impact comprehension of a police caution amongst adults within the criminal justice system, such as demographic characteristics and cognitive and/or psychiatric variables.

Method

Eligibility criteria

Studies that assessed caution understanding amongst suspects and offenders were considered for inclusion. The following eligibility criteria were applied to article selection:

Inclusion criteria

- Participants within the Criminal Justice System at the time of assessment
- English language publication
- Peer-reviewed published articles
- Participants with minimum age of 16 years
- Study includes assessment of verbal presentation of caution.

Exclusion criteria

- Participants with a formally diagnosed intellectual disability, where results from this group cannot be differentiated from those of other groups in the study.

Search strategy

Relevant articles were found using the following search terms: (police caution* OR Miranda warning* OR Miranda right*) AND (comprehen* OR understand*). A MeSH term search (US National Library of Medicine, 2017) did not return other suitable synonyms.

Psychological and legal databases were selected as they were considered reflective of the systematic review focus. The databases included in the search were EMBASE, Medline, Medline daily, Medline ePub ahead of print, in-process & other non-indexed citations, PsychInfo, Criminal Justice Database, Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Science Database and Westlaw. All searches were carried out on 1 November 2017.

Data extraction

Demographic data, including age, gender, recruitment population, number of prior arrests and years of education were extracted if provided within the article. Any measures of cognitive ability, such as IQ and its indices, were extracted as well as any further psychological measures assessing cognitive functioning or mood/mental illness.

Quality assessment of studies

The lead investigator developed an assessment to critically appraise study quality. This was informed by previously published quality checklists, the Critical Appraisal Skills Programme (CASP; Critical Appraisal Skills Programme, 2018) and Scottish Intercollegiate Guidelines Network (SIGN) methodology checklists (SIGN, 2012), with questions tailored or added to best consider the review question.

The criteria focused on rationale, sample characteristics, assessment measures, analysis of results and acceptability of conclusions drawn. These were assessed over 14 quality criteria, which could be scored as 2 (well covered), 1 (adequately addressed) or 0 (poorly addressed).

As a check of reliability, an independent reviewer, a third-year trainee clinical psychologist, applied the quality assessment to six randomly selected papers to reduce risk of bias (Haahr, 1998). Cohen's κ suggested moderate agreement in ratings, $\kappa = .78$, $p < .001$ (McHugh, 2012). All initial disagreements were discussed and resolved collaboratively. There were no noticeable areas of disagreement across criteria that were considered more prevalent.

Results

The electronic literature search retrieved 438 papers, with 285 remaining after the removal of duplicates. A screening of article titles left 76 papers as potentially relevant to the review question. A review of these abstracts left 46 papers. For those abstracts considered unclear, the full text was reviewed against the inclusion/exclusion criteria. This left the remaining 12 for inclusion. A review of the reference lists of included papers returned one more paper (Rogers, Robinson, & Henry 2017). A flow chart of this process is provided in Figure 1. Generally, the papers included did not solely assess caution comprehension amongst adults within the

criminal justice system or solely verbal caution presentation. Therefore, only the relevant data and related analyses were considered. Table 1 contains a brief overview of the tools used to assess caution comprehension. The conclusions within Table 2 are only those relevant to the current review question.

This systematic review utilises a narrative approach to reviewing the literature. It is recognised that this descriptive approach to data synthesis has drawbacks, for example drawing out potential small effects and presenting a risk of researcher bias in reporting/conclusions (Petticrew, 2003; Rumrill & Fitzgerald, 2001). However, the included literature is heterogeneous, with various measures of comprehension and methodologies that preclude pooling together of data, for example by using a meta-analytical approach.

Quality ratings

The standard of papers was generally limited (Table 3). This was most apparent in a lack of consideration and/or reporting of confounding variables, determination of sample size or adequate acknowledgement of study limitations. However, they did generally include a clear, relevant development of rationale with explicit objectives and reported conclusions. The samples were typically representative of the populations being considered. No studies were remarkably better methodologically than the others and could not be considered to have more robust findings; therefore no greater weight was placed upon the conclusions of any one study over another.

Sampling

Studies tended to apply minimal inclusion criteria, which increased the potential for confounding variables that may influence scoring across participants. The Rogers et al. papers did not provide ranges for assessed IQ, for example (Rogers et al., 2013; Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Harrison, et al., 2010; Rogers et al., 2009;

Figure 1. PRISMA flowchart: study identification and inclusion (Moher, Liberati, Tetzlaff, & Altman, 2009). Search completed: 1 November 2017.

Rogers, Henry, Sharf, Robinson, & Williams, 2017; Rogers, Robinson, & Henry, 2017; Rogers, Rogstad, Steadham, & Drogin, 2011), two papers included participants with IQs

below 70 (Cooke & Philip, 1998; Fenner et al., 2002), and the Everington and Fulero (1999) paper ‘assumed average intelligence’ of their relevant sample, without formal evaluation.

Table 1. Tests of caution comprehension.

Test name	Brief detail of assessment	Author(s) & country of origin
Comprehension of Miranda Rights (CMR)	<ul style="list-style-type: none"> Define each element of the Miranda statement. Identify whether each element has identical meaning to rephrased statements. 	Grisso (1981, 1986), USA
Test of Caution Comprehension (ToCC)	<ul style="list-style-type: none"> Define words within the statement. Define each element of the caution. Identify whether each element has identical meaning to rephrased statements. Define words within the caution 	Olley, Ogloff, & Jager (1993), Canada
Comprehension of Caution Test (CoCT)	<ul style="list-style-type: none"> Define whole caution. Identify whether each element has identical meaning to rephrased statements. Define words within the caution. Decide whether a statement means the same or something different to each element. 	Cooke & Philip (1998), Scotland
Miranda Statements Scale (MSS)	<ul style="list-style-type: none"> Uses warnings at various (reading) levels. Define each element of caution. 	Rogers (2005), USA
Miranda Vocabulary Scale (MVS)	<ul style="list-style-type: none"> Define 'Miranda-relevant' words. 	Rogers et al. (2009), USA
Below are assessments that do not assess understanding of the wording of a caution.		
Miranda Rights Scale (MRS)	<ul style="list-style-type: none"> Provide reasons for waiving rights in own case. Questions: Advantages and disadvantages of Miranda-related decisions. 	Rogers (2006), USA
Miranda Quiz (MQ)	<ul style="list-style-type: none"> 15 true–false questions regarding Miranda decisions and consequences. 	Rogers, Harrison, et al. (2010), USA
Function of Rights in Interrogation (FRI)	<ul style="list-style-type: none"> Vignettes with 15 questions related to appreciation of Miranda rights. 	Grisso (1998), USA

Although classification of an intellectual disability requires more than an assessment of IQ (World Health Organisation, 1992), it is possible these samples include individuals who could be classified as such – for example, Cooke and Philip (1998) included people in their sample who they described as finding it difficult to cope in prison, which, Cooke and Philip suggested, was likely due to poor intellectual functioning. People with intellectual disabilities are a population for which evidence has suggested impaired performance on caution comprehension (e.g. Everington & Fulero, 1999; Fulero & Everington, 1995; O'Connell et al., 2005). As studies did not

include stringent exclusion criteria, it is possible some participants would have other cognitive or neurodegenerative conditions, such as dementia, that may reasonably be assumed to influence performance. The review suggests that potential confounders were not adequately controlled for within the analyses of any included articles. Therefore, without explicit consideration of these and related features, impact of potential confounders on comprehension cannot be explored or excluded.

A broad range of ages were represented across the studies. Only two included articles considered any association of age with assessment of caution comprehension (Frumkin

Table 2. Overview of included studies.

Authors (Year of publication) Country	Sample relevant to research question	Cognitive measure(s)	Other psychological / psychiatric measure(s)	Assessment(s) of caution knowledge	Key relevant conclusions
1. Cooke & Philip (1998), Scotland	Young offenders. <ul style="list-style-type: none">• N: 100 (all male).• Age: $M = 18$ years (4.8; 16–21^a).• No. offences: $M = 20.8$ (52.7; 1–450).• Education: 47% had no educational qualifications.	Silverstein 4 subtest of WAIS–R (Silverstein, 1982). FSIQ: $M = 87.46$ (11.76; 64–123).	Not assessed.	CoCT	<ul style="list-style-type: none">• Comprehension low amongst participants.• Discrepancy between reported understanding and comprehension.• Comprehension associated with IQ, particularly Verbal IQ.• No relationship between experience with the criminal justice system and comprehension.• No analysis considering educational attainment.
2. Everington & Fulero (1999), USA	Defendants. <ul style="list-style-type: none">• N: 30 (25 M, 5 F).• Age: $M = 33.5$ years (–, 19–67).• Prior convictions: $M = 3.33$ (–, 1–9).	No IQ assessment ‘Assumed average intelligence.’	Modified GSS	CMR	<ul style="list-style-type: none">• 17% did not meet ‘minimum’ criteria for competence.• Relationship between increasing suggestibility and poorer comprehension.• No analysis with prior convictions.
3. Fenner et al. (2002), England & Wales	Suspects in police detention. <ul style="list-style-type: none">• N: 30 (28 M, 2 F).• Age: $M = 27.5$ years (–, 17–64).• Prior arrests: $M = 15.7$ (17.4; 0–70).	3 Subtest WAIS–R FSIQ: $M = 78.6$ (9.1; 66–98). Verbal IQ: $M = 79.0$ (9.6; 65–105). Performance IQ:	None.	Method based on Grisso (1981) & Brown (1997).	<ul style="list-style-type: none">• No participants demonstrated full understanding.• No significant correlation between understanding and previous exposure.• 1 participant indicated lack of understanding.

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Table 2. (Continued).

Authors (Year of publication) Country	Sample relevant to research question	Cognitive measure(s)	Other psychological / psychiatric measure(s)	Assessment(s) of caution knowledge	Key relevant conclusions
4. Viljoen, Roesch, & Zapf (2002), Canada	• Prior cautions: $M = 17.6$ (22.4; 0–100).	$M = 81.7$ (13.7; 57–114).			• No analysis of cognitive measures with comprehension.
	Defendants (inpatients, pre-trial).	WAIS-R	SCID-P	ToCC	• Significant positive relationship of IQ with comprehension.
	• N : 212 (gender not provided)	(Block Design & Vocabulary)	Information held on prior mental health		• Impaired performance in recognition amongst defendants with ‘broad types of psychotic disorders’, compared to other mental health diagnoses.
	• Age: $M = 31.95$ years (no overall SD ; —).	FSIQ: $M = 93.85$ (no overall SD ; —).	experiences e.g. psychiatric hospitalisations, previous contact with mental health services.		• Age unrelated to performance.
	• 89% report previous arrests.				• Right to silence better understood than right to counsel.
5. Rogers, Harrison, Hazelwood, et al. (2007), USA ^b	Mentally disordered defendants.	WASI	SADS		• No analysis considering prior arrests.
	• N : 107 (84 M, 23 F).	FSIQ: $M = 81.08$ (14.45; —).	Global Assessment of Functioning: $M = 43.70$ (12.20; —).	MSS	• Poor comprehension across all participants.
	• Age: $M = 38.95$ years (11.45; —).	Verbal IQ: $M = 78.61$ (14.52; —).	GSS	MRS	• Lower IQ and achievement related to poorer performance in comprehension. Verbal IQ and listening strongest predictors.
	• Prior arrests: $M = 11.69$ (11.45; —).	Performance IQ: $M = 86.55$ (15.14; —).			• Evidence of negative impact of impaired global psychological function and mania on performance.
	• Years of education: $M = 11.42$ (2.17; —)	WIAT-II Listening: $M = 75.28$ (18.65; —).			

(Continued)

Table 2. (Continued).

Authors (Year of publication) Country	Sample relevant to research question	Cognitive measure(s)	Other psychological / psychiatric measure(s)	Assessment(s) of caution knowledge	Key relevant conclusions
6. Rogers, Hazelwood, Sewell, Blackwood, Rogstad, & Harrison ^b (2009), USA	Defendants (recently arrested, mentally disordered, detainees) • <i>N</i> : 488 (370 M, 118 F) • Age: <i>M</i> = 33.31 years (no overall <i>SD</i> ; —). • Prior arrests: <i>M</i> = 10.66 (no overall <i>SD</i> ; —). • Years of education: <i>M</i> = 11.71 (no overall <i>SD</i> ; —).	Reading: <i>M</i> = 67.51 (16.62; —).			• No relationship between experience with the criminal justice system and comprehension. • Years of education did not impact comprehension.
		WASI FSIQ: <i>M</i> = 89.46 (no overall <i>SD</i> ; —). Verbal IQ: <i>M</i> = 87.05 (no overall <i>SD</i> ; —). Performance IQ: <i>M</i> = 93.57 (no overall <i>SD</i> ; —).	SADS-C Global Assessment Scale: <i>M</i> = 57.30 (no overall <i>SD</i> ; —).	MSS MVS (Paper is describing development of this scale)	• Verbal IQ related to understanding of vocabulary. • Performance IQ less significant relationship. • Reading and listening comprehension strongly related to understanding of vocabulary.
		WIAT-II Listening: <i>M</i> = 85.51 (no overall <i>SD</i> ; —). Reading: <i>M</i> = 80.22 (no overall <i>SD</i> ; —).			• Psychological impairment associated with poor performance in vocabulary, but less than cognitive abilities.
					• Small correlation of years in education with understanding caution vocabulary.
					• No analysis considering prior arrests.
				MSS MVS MRS	• Positive correlation between vocabulary, verbal IQ, reading comprehension and listening comprehension with caution vocabulary.
7. Rogers, Harrison, et al. (2010), USA ^b	Pre-trial defendants (recently arrested, mentally disordered, general). • <i>N</i> : 488 (370 M, 118 F).	WASI Overall scores not provided. WIAT-II	SADS-C GSS		

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Table 2. (Continued).

Authors (Year of publication) Country	Sample relevant to research question	Other			Key relevant conclusions
		Cognitive measure(s)	psychiatric measure(s)	Assessment(s) of caution knowledge	
8. Rogers, Rogstad, et al. (2011) ^b , USA	• Age: $M=32.60$ years (10.98; —).	Overall scores not provided.			• Psychological impairment not related to comprehension.
	• Years of education: $M=11.76$ (21.52; —).				• Reducing suggestibility had small correlation with cautions considered easy and moderately complex.
	• Prior arrests: $M=11.45$ (21.52; —).				• No significant difference from length of detainment.
	Pre-trial defendants (recently arrested, general).	WASI FSIQ: $M=94.75$ (11.97; —).	Not assessed.	MSS MVS	• Vocabulary greater predictor of caution comprehension.
	• $N: 416$ (314 M, 102 F).	Verbal IQ: $M=92.14$ (12.37; —).			• Matrix reasoning less so.
9. Frumkin, Lally, & Sexton (2012), USA	• Age: $M=30.77$ years (10.11; 17–61).	Performance IQ: $M=92.28$ (12.77; —). WIAT-II			• Minor role of listening comprehension on comprehension.
	• 46.6% achieved high school diploma or equivalent.	Reading: $M=9.84$ (12.77; —).			• Minor effect of education, but only cautions of minimum complexity.
	• Prior arrests: $M=11.19$ (18.58, —).	Listening: $M=9.68$ (2.64; —).			• No relationship between prior arrests and comprehension.
	Pre-trial defendants.	Only where available from prior testing.	Not assessed.	Lack of distinction between verbal and non-verbal presentation.	• Positive relationship between verbal comprehension and comprehension.
	• $N=263$ (gender not specified for group).	WAIS-R / WAIS-III FSIQ: $M=79.6$ (14.1; —). Verbal		CMR FRI	• Small negative correlation between comprehension and scoring on suggestibility.
	• Age: $M=28.4$ years (11.1; 17–74).	Comprehension: $M=81.8$ (14.3; —).			• Age not a predictor of comprehension.

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Table 2. (Continued).

Authors (Year of publication) Country	Sample relevant to research question	Cognitive measure(s)	Other psychological / psychiatric measure(s)	Assessment(s) of caution knowledge	Key relevant conclusions
10. Rogers, Fiduccia, Robinson, Steadham, & Drogin ^b (2013), USA	Defendants (pre-trial detainees). <i>N</i> : 133 (gender not specified).	Across full sample (<i>N</i> = 260).	<u>SADS</u>	<u>MQ</u> <u>MSS</u> <u>MVS</u>	<ul style="list-style-type: none">• Poor comprehension, regardless of education or experience in the criminal justice system.• No assessment of WASI, WIAT-II or SADS with comprehension.
	• Age (across full sample, <i>n</i> = 260): <i>M</i> = 33.31 years (10.75; —).	WASI			
	• 81.9% completed high school or GED equivalent (across full sample, <i>n</i> = 260).	FSIQ: <i>M</i> = 90.33 (11.86; —). WIAT-II			
	• Previous arrests (across full sample, <i>n</i> = 260): <i>M</i> = 13.28 (32.64; —).	Reading: <i>M</i> = 8.38 (no overall <i>SD</i> ; —). -Listening: <i>M</i> = 8.92 (no overall <i>SD</i> ; —).			
11. Chaulk, Eastwood, & Snook (2014), Canada	Offenders	WAIS-IV	Not Included.	Used video of	<ul style="list-style-type: none">• Participants understood around 30% of components making up caution.• Small positive association between vocabulary (verbal comprehension) and comprehension. Smaller relationship between digit span (verbal working memory).• Small association of listening comprehension with caution comprehension.• Performance significantly better in comprehension of
	• <i>N</i> : 60 (57 M, 3 F).	Vocabulary sub-test:		caution being read out.	
	• Age: <i>M</i> = 37.75 years (12.33; 19-74).	<i>M</i> = 5.67 (2.91; 1-14)		Knowledge assessed using method developed in study.	
	• Years of education: <i>M</i> = 11.45 (2.53; 7-19).	Digit Span sub-test: <i>M</i> = 7.13 (2.83; 1-14).			
	• Self-reported caution exposures: <i>M</i> = 16.32 (20.90; —).	WJ-III Listening			
		Comprehension: <i>M</i> =6.41 (3.37; 1-18)			<ul style="list-style-type: none">• Small association of listening comprehension with caution comprehension.• Performance significantly better in comprehension of

Table 2. (Continued).

Authors (Year of publication) Country	Sample relevant to research question	Other			Key relevant conclusions
		Cognitive measure(s)	psychological / psychiatric measure(s)	Assessment(s) of caution of knowledge	
12. Rogers, Henry, et al. (2017), USA ^b	Offenders.				
	Data across full sample	WASI-II Verbal	32.6% had previously been admitted to a psychiatric hospital at least once.	MQ MV/S	
	• N: 129 (74 M, 55 F).	Comprehension (across full sample, n = 129); M = 86.22 (10.29; —).			right to silence, compared to right to legal counsel.
	• Age: M= 34.32 years (11.40; 18–67).				• Report no association between experience in criminal justice system and knowledge, with no apparent analysis.
	• Years of education: M= 11.75 (1.79; —).				• Significantly poorer performance across measures when impaired verbal comprehension.
	• Prior arrests: M= 10.34 (11.54; —).				
13. Rogers et al. (2017), USA ^b	Detainees.	WASI-II	Not included.	MQ MV/S	
	• N: 70 (35 M, 35 F).	FSIQ: M= 86.66 (12.23; —).			• Most difficulty remembering continuing legal rights. Right to silence best remembered of legal rights.
	• Age: M= 33.14 years (10.87; —).				
	• Years of education: M= 11.25 (2.21; —).				
	• Lifetime arrests: M= 10.30 (7.00; —).				

Note: Dash (—) indicates that details of this were not reported in article. M = male; F = female.
Cognitive measures: WASI-R = Wechsler Adult Intelligence Scale-Revised; WASI-III = WASI-3rd Edition (Wechsler, 1981, 1997); WASI = Wechsler Abbreviated Scale of Intelligence; WASI-II = WASI-2nd Edition (Wechsler, 1999, 2011); WIAT-II = Wechsler Individual Achievement Test (Psychological Corporation, 2002); WIJ-III = The Woodcock-Johnson Tests of Achievement-Third Edition (Woodcock, McGrew, & Mather, 2007); FSIQ = full-scale intelligence quotient.
Psychological/psychiatric measures: SCID-P = Structured Clinical Interview for DSM-III-R, where DSM-III-R = *Diagnostic and Statistical Manual of Mental Disorders-Third Edition, Revised* (Spitzer, Williams, Gibbon, & First, 1990); SADS = Schedule for Affective Disorders & Schizophrenia (Spitzer & Endicott, 1978);

SADS-C = SADS-Change Version; GSS = Gudjonsson Suggestibility Scale (Gudjonsson, 1984, 1997); ILK = Inventory of Legal Knowledge (Otto, Musick, & Sherrod, 2010).

Assessments of Caution Knowledge: CoCT = Comprehension of Caution Test (Cooke & Philip, 1998); CMR = Comprehension of Miranda Rights (Grisso, 1981, 1986); ToCC = Test of Charter Comprehension (Olley et al., 1993); MSS = Miranda Statements Scale (Rogers, 2005); MRS = MRS, Miranda Rights Scale (Rogers, 2006); MVS = Miranda Vocabulary Scale (Rogers et al., 2009); MQ = Miranda Questionnaire (Rogers, Harrison, et al., 2010); FRI = Function of Rights in Interrogation (Grisso, 1998).

^aStandard deviation; range.

^bPart of larger funded project, National Science Foundation Law & Social Sciences Programme.

et al., 2012; Viljoen et al., 2002), with no relationship found. This contrasts with an apparent positive association suggested from performance amongst juvenile offenders (e.g. Frumkin et al., 2012; Zelle et al., 2015), indicating that this effect potentially plateaus as individuals reach adulthood (Frumkin et al., 2012), albeit suggested from only a limited literature base. In considering adults, this review included studies with participants aged 16 years and over. However, it is recognised that age of adulthood can vary across jurisdictions. One study included participants from the age of 16 years (Cooke & Philip, 1998), with several including participants from the age of 17 years (Fenner, Gudjonsson & Clare, 2002; Frumkin, Lally & Sexton, 2012; Rogers, Rogstad, et al., 2011).

Most studies did not match for gender. Over the 10 studies where the gender split was provided, or possible to derive, 31.6% were female. Although a rudimentary comparison, this is considerably higher than the proportion (6.9%) in US prisons, according to the Federal Bureau of Statistics (2018). None of the included studies analysed the impact of gender on performance; however, statistically small differences between sex on verbal and working memory abilities would suggest that differences may be unlikely, as these are currently considered central cognitive components to understanding (e.g. Hyde & Linn, 1988; Lynn & Irwing, 2008; Wallentin, 2009).

In considering years of education, this was shown to have little (Rogers, Rogstad, et al., 2011) to no (Rogers, Harrison, Hazelwood, et al., 2007) association with overall comprehension, or possibly only with understanding of the specific words used in cautions (Rogers et al., 2009). Notably, of the included articles, this relationship was only considered in the Rogers et al. papers.

Cognitive influences

The studies reviewed repeatedly suggested a relationship between IQ and performance on assessments of caution comprehension. The quality of IQ assessments varied across

Table 3. Quality ratings of papers.

Criterion	1	2	3	4	5	6	7	8	9	10	11	12	13
1. The study considers and discusses relevant literature.	2	2	2	2	1	2	2	2	2	1	2	2	2
2. The study addresses appropriate and clearly focused question(s), objective(s) or hypotheses.	1	1	1	2	1	1	1	1	2	1	2	2	2
3. Sample recruited in an acceptable way.	1	1	1	2	1	1	1	1	1	1	1	0	1
4. The sample was representative of the population being considered.	0	1	1	2	1	2	2	2	2	2	1	1	1
5. Appropriate methods applied to determine sample size.	0	0	0	0	0	0	0	0	0	0	0	0	0
6. The measure of caution comprehension is valid and reliable.	1	1	1	1	1	1	1	1	1	1	0	1	1
7. The measure of IQ is reliable and comprehensive.	1	0	1	1	1	1	1	1	1	1	1	1	1
8. The cognitive measure(s) used (other than IQ) are reliable.	—	0	—	—	2	2	1	2	—	2	1	—	—
9. Other psychological/psychiatric measure(s) used are reliable.	—	—	—	1	2	2	2	—	—	2	—	—	—
10. The method of analysis is considered appropriate for the research question(s) and is clearly reported.	0	1	1	1	1	1	1	1	2	1	1	2	2
11. The main potential confounders identified and considered in the design and analysis to minimise bias.	0	0	0	0	0	0	0	0	0	0	0	0	0
12. Effect sizes & confidence intervals reported as appropriate.	0	0	0	1	1	1	2	1	1	1	1	2	2
13. Conclusions drawn appropriate to study results.	1	1	1	2	2	2	1	2	1	2	2	2	2
14. The study recognizes and reports its limitations.	0	1	0	2	1	0	1	1	1	1	1	1	1

Note: 1: Cooke & Philip (1998); 2: Everington & Fulero (1999); 3: Fenner et al., (2002); 4: Viljoen, Roesch, & Zapf (2002); 5: Rogers, Harrison, Hazelwood, et al. (2007); 6: Rogers et al. (2009); 7: Rogers, Harrison, et al. (2010); 8: Rogers, Rogstad, et al. (2011); 9: Frumkin, Lally, & Sexton (2012); 10: Rogers, Fiduccia, Robinson Steadham, & Drogin (2013); 11: Chaulk, Eastwood, & Snook (2014); 12: Rogers, Henry, et al. (2017); 13: Rogers, Robinson, & Henry (2017). Dash (—) indicates that criterion is not applicable to article.

studies, with one study drawing from previously assessed IQ using a comprehensive measure (Frumkin et al., 2012), whilst others used only abbreviated or prorated versions (Cooke & Philip, 1998; Fenner et al., 2002; Rogers et al., 2013; Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Harrison, et al., 2010; Rogers et al., 2009; Rogers, Henry, et al., 2017; Rogers, Robinson, & Henry, 2017; Rogers, Rogstad, et al., 2011; Viljoen et al., 2002). In considering the versions used, the original Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) was most common across the articles (Rogers et al., 2013; Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Harrison, et al., 2010; Rogers et al., 2009; Rogers, Rogstad, et al., 2011), which has had its validity, in relation to a full assessment of intellectual functioning, questioned (Axelrod, 2002). The WASI-II (Wechsler, 2011), however, used twice (Rogers, Henry, et al., 2017; Rogers, Robinson, & Henry, 2017), has been suggested to have improved validity (Irby & Floyd, 2013).

When the domains contributing to overall IQ were considered separately, their respective assessments of verbal abilities were repeatedly identified as having the greatest relationship with comprehension (Chaulk et al., 2014; Cooke & Philip, 1998; Frumkin et al., 2012; Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Harrison, et al., 2010; Rogers et al., 2009; Rogers, Henry, et al., 2017; Rogers, Rogstad, et al., 2011), which is logical when considering understanding of verbally presented information. This has also been found in studies assessing non-adult offender samples, for example juveniles (e.g. Grisso, 1981), adults with an intellectual disability (e.g. Fulero & Everington, 1995) and an ethnically diverse sample of college students and adults (e.g. Johnson, Citron-Lippmann, Massey, Raghavan, & Kavanagh, 2015). Of those studies included in the present review, only Chaulk et al. (2014) specifically considered performance in WAIS subtests. They found

that verbal working memory, as assessed by the Digit Span test, indicated a possible relationship with comprehension, but less so than verbal comprehension (as assessed by the Vocabulary subtest).

Listening comprehension may have a predictive role in understanding an oral caution (Chaulk et al., 2014; Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Rogstad, et al., 2011), with reading and listening comprehension related to understanding of caution vocabulary (Rogers, Harrison, et al., 2010; Rogers et al., 2009). However, the range of studies considering this remains limited.

Two studies reported a small negative relationship between suggestibility and caution comprehension (Everington & Fulero, 1999; Rogers, Harrison, et al., 2010). Suggestibility, in the assessed context, is the likelihood that a person's recollection of an event will be modified based on exposure to subsequent information, for example from leading questions (Clare & Gudjonsson, 1993). This association must be considered carefully, as the Gudjonsson (1984, 1997) assessment tool used in both studies requires memory of a read fictional story, possibly a proxy measure of verbal ability and memory capacity, as opposed to exclusively suggestibility (Willner, 2011). This possibility was recognised by Gudjonsson (1984), but not empirically explored, and is perhaps most pertinent to individuals with challenges in memory capacity, such as those with intellectual disabilities (Beail, 2002; Willner, 2011).

Psychiatric influences

Consideration of the impact of psychiatric diagnoses on caution comprehension was limited to four included articles (Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Harrison, et al., 2010; Rogers et al., 2009; Viljoen et al., 2002). They indicated that the influence of psychological impairment or psychiatric diagnoses on performance was limited (Rogers, Harrison, Hazelwood, et al., 2007; Rogers et al., 2009; Viljoen et al., 2002) to

none (Rogers, Harrison, et al., 2010). This first appears counter to the suggestion that mental illness can impair cognitive functioning (Clements, Corney, Humin, Karmas, & Henderson, 2015). However, the ethical requirement of participant capacity to consent to taking part in the studies prevents opportunity to include participants who may be more severely cognitively impaired by their illness, such as the floridly psychotic or severely depressed (Amer, 2013; Clements et al., 2015). Hence, it is feasible there may be an association between comprehension of caution and mental illness for those individuals at the more severe end of the spectrum, who are experiencing active symptoms of illness (Rogers & Drogin, 2014). At present, a lack of data precludes any strong conclusions in this area.

Influence of prior arrests

The studies repeatedly indicated that the number of self-reported prior arrests, and therefore presumable prior experience of cautioning, were not related to performance in assessment of comprehension (Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Rogstad, et al., 2011). This association was also found when Fenner et al. (2002) explicitly asked about numbers of prior caution exposures, and Cooke and Philip (1998) considered the number of self-reported prior offences. The association is in keeping with the Rogers et al. (2013) study, where they did not find that experimentally repeated exposures improved performance in assessment of caution comprehension. However, it is possible that participant reports of prior arrests could be minimised or exaggerated, and it is unlikely that all participants would necessarily know, especially, for example, when reported figures can be over 100. It is also possible that a number of these participants had the caution explained to them in the past, which may have affected their performance at assessment. Only Fenner et al. (2002) explicitly asked this and found that explanations had occurred 0.34

(1.67; 0–9) times across participants. However, the suggestion that prior experience of cautioning was not related to current comprehension was repeatedly found, regardless of study quality. This is converse to Grisso's (1980) original development of an assessment of caution understanding that did suggest that prior arrests were related to understanding.

Experimental method

All the studies included have arguably limited ecological validity. The assessments were completed by researchers and not the police, with absence of the stress typical of police interrogation (e.g. 'unhurried' assessment sessions in a 'nonadversarial setting', Rogers, Harrison, Hazelwood, et al., 2007). Stress has been shown to negatively impact cognitive functioning (Eysenck, Derakshan, Santos, & Calvo, 2007; Moran, 2016) and therefore presumably affect caution comprehension (Rogers, Gillard, et al., 2011; Scherr & Madon, 2012).

The measures used to assess comprehension were varied, but there was generally a lack of psychometric data to support their validity and/or reliability. The measures may not provide information regarding participant understanding of the implications of choices being made or real-life action (Grisso, 1998). Some studies have also included assessments considering this, such as the Function of Rights in Interrogation (Grisso, 1998). It is possible, where participants do not say or describe certain aspects of the caution, that responses do not always reflect misunderstanding. However, it is recognised that free recall is a commonly used indirect method of knowledge assessment, and the general consistency of the findings would suggest that this potential effect is limited (Chaulk et al., 2014). The specific wording and complexity of the cautions would also vary depending on the assessments used in each study, with some studies assessing more than one version in the one assessment session. The Miranda Statements Scale (Rogers, 2005), for example,

assessed various versions of a caution ranging from easy to difficult in complexity. This variability in wording may be considered more reflective of the real-life situation where police can typically use non-prescribed phrasing to communicate interrogation rights, whilst the rights are often consistent across jurisdictions (The Law Library of Congress, 2016).

When comparing performance in understanding of the right to silence and access to a lawyer, the limited studies suggested that the right to silence was the most commonly reported and understood of the rights (Rogers, Robinson & Henry, 2017; Viljoen et al., 2002). This is consistent with the suggestion that phrasing of this right is typically the least complex (Rogers, Harrison, Shuman, et al., 2007; Rogers et al., 2008).

Discussion

The conclusions drawn in the reviewed papers should be considered carefully. They typically used limited sampling controls, used varied measures of assessing caution comprehension and varied in the quality of cognitive and psychiatric assessment tools used. More generally, they had limited ecological validity and therefore perhaps overestimated understanding, where situational factors may play a role. It is suggested that individual characteristics that had historically been considered most relevant to potential challenges in caution comprehension may not always be empirically supported (Ryba et al., 2007).

Findings across the studies suggested that performance on assessments of caution comprehension was limited, with an individual's IQ and verbal abilities considered most closely associated to this. Although it may be theoretically assumed that adequate verbal working memory is required to help understand verbally presented information (Baddeley, 2012; Ferreira & Patson, 2007), only one study considered this and found a small association with comprehension (Chaulk et al., 2014). Years of education, age (within adults) and prior

experience of cautioning all had limited to no bearing on understanding. There is also limited to no suggested impact of mental illness on performance in the included studies, although the most ill are unlikely to have been considered suitable for participation due to concerns regarding capacity to consent (Amer, 2013; Clements et al., 2015). Indeed Rogers and Drogin (2014) have suggested few effects on caution comprehension at mild to moderate severity, but that such influences emerge with more extreme severity.

Limitations of systematic review

Nine of the articles included in this review were from the USA, with two from Canada and two from the UK. Seven of the USA articles were funded by the National Science Foundation Law & Social Sciences Programme. A number of those articles from the programme explored performance in certain tests that were part of a larger assessment battery completed with each participant (e.g. Rogers et al., 2013; Rogers, Harrison, Hazelwood, et al., 2007; Rogers, Harrison, et al., 2010; Rogers et al., 2009; Rogers, Rogstad, et al., 2011). Therefore, it is possible, though not always clear, that findings over these articles were pooled from the same sample, which would bias results. The variability in cautions between jurisdictions limits the drawing of generalisations from this review. Nonetheless, the rights being communicated are generally consistent across jurisdictions (The Law Library of Congress, 2016); however, the wording, complexity and length can vary considerably between, as well as within, jurisdictions (Law Library of Congress, 2016; Rogers, Harrison, Shuman, et al. 2007; Rogers et al., 2009). This lack of variability may have been a product of the search strategy; however, broad search terms were used to increase the volume of studies retrieved, and a review of reference lists only indicated one further (US) study. This suggests that the strategy captured appropriate studies well.

The inclusion criteria permitted both convicted offenders and suspects to be included in the assessments. The themes did appear to run across the samples of people involved in the criminal justice system; however, it is still theoretically possible that participants who had not yet been tried for a suspected crime would be more likely to feign or potentially have something to gain from not understanding (Cooke & Philip, 1998). Indeed, Rogers, Henry, et al. (2017) and Rogers, Robinson, and Henry (2017) have been working on developing an instrument to help indicate those individuals who may be feigning misunderstanding.

Implications

The findings suggest a need to truly consider the rationale for providing a caution verbally, when studies repeatedly indicated insufficient understanding amongst those individuals for whom it is intended. It may reasonably be suggested that a full assessment of caution comprehension should be conducted for all defendants as a standard practice (Rogers, Rogstad, et al., 2010).

This potential for misunderstanding one's interrogation rights is concerning when one considers the power a confession carries in jury decision making. Kassir et al. (2010) explored police interrogation practices and described inappropriate strategies that some officers may utilise to achieve such confessions. This is a concern when there have been some examples of increasing scientific advances disproving confessions obtained by individuals for crimes they did not commit (Kassir et al., 2010; Sango & Halpert, 2007). It had also been suggested that there is a potential for this knowledge of misunderstanding caution wording to be misused, for example police using complex language or phrasing, not further checking understanding when the accused indicates comprehension or expressing the caution in a way that gives the impression it is a procedural step that does not

carry much weight (Kassir et al., 2010; Rogers, Rogstad, et al., 2011).

Future directions

It is suggested that future research could focus on situational factors that may influence comprehension, for example using more naturalistic experimental methods, such as mock interrogation (e.g. Rogers, Gillard, et al., 2011; Scherr & Madon, 2012; Snook et al., 2016). It is also important to consider alternative means of communicating rights, such as always including a written version (e.g. Eastwood & Snook, 2009; Hughes et al., 2013; Rogers, Rogstad, et al., 2011) or applying techniques to a spoken caution that are considered to improve the understanding of verbally presented information (e.g. Eastwood & Snook, 2012; Snook et al., 2016).

It is important to ensure that caution delivery is monitored and that appropriate training is provided – that is, appropriate wording, presentation and knowledge checking that goes beyond a closed yes/no question (Cooke & Philip, 1998; Fenner et al., 2002), perhaps by asking individuals to explain their understanding. This can prevent the dismissal of important evidence, which is based on later discovery of caution misunderstanding, or even the potential of feigned miscomprehension being used to manipulate the system (Rogers, Henry, et al., 2017; Rogers, Robinson, & Henry, 2017).

Conclusions

The quality of literature exploring comprehension of a verbal caution within adults in the criminal justice system was considered generally limited, with inconsistent focus on potential predictor variables. The outcomes currently suggest that IQ and verbal abilities may be most closely related to understanding. However, the quality and heterogeneity of the reviewed literature limit the extent to which this can be adequately inferred. There is not enough evidence of a relationship between

understanding and education, psychiatric diagnoses and/or experience in the criminal justice system. This is important to consider when a number of these variables seem intuitively pertinent to caution understanding. Research should continue to identify variables, individual and situational, that may impact comprehension, but also focus effort toward methods of providing a caution that can support understanding.

Ethical standards

Declaration of conflicts of interest

Michael Rendall has declared no conflicts of interest

Ken MacMahon has declared no conflicts of interest

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

ORCID

Michael Rendall <http://orcid.org/0000-0002-1839-8788>

Ken MacMahon <http://orcid.org/0000-0002-2175-8043>

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