Police perceptions of the impact that ADHD has on conducting cognitive interviews with youth

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Attention deficit hyperactivity disorder (ADHD) in youth witnesses, victims and suspects can significantly impact the investigative interviewing process. In this study, 102 Child Protection Investigation Unit (CPIU) detectives were asked to read four vignettes of adolescents being interviewed by police, two as witnesses and two as suspects, in which one witness and one suspect display ADHD-type behaviour. The detectives rated the degree to which the behaviour in each vignette would impact the interviewer's ability to use the 10 key components of the cognitive interview (CI). They perceived ADHD-type interviewee behaviour as significantly hampering the use of all 10 CI components. There is also a significant difference between the detectives' rated severity of each CI component; they rated Encourage Concentration, Mentally Recreate and Change Order as exerting the strongest impact on the interview process. Implications for police perceptions of training options, needs and preferences regarding interviewing youth with ADHD are discussed.

Keywords: ADHD; cognitive interview; police; youth; vignette; CPIU; interviewing; detective; forensic; investigative interviewing.

Introduction

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder with childhood onset that often endures into adulthood (Ginsberg, Hirvikoski, & Lindefors, 2010; Young & Gudjonsson, 2008). It is associated with brain abnormalities that contribute to executive function deficits in attention, working memory, impulse control, planning, problem-solving, judgement and decision-making (Barkley, 2015; Bruchmuller, Margraf, & Schneider, 2012; DosReis, Barksdale, Sherman, Maloney, & Charach, 2010; Garfield et al., 2012). Although prevalence rates are estimated at 3.4% for children and adolescents in the general population (Polanczyk, Salum, Sugaya,

Caye, & Rohde, 2015), they are higher in forensic populations, occurring in 30.1% of youth versus 26.2% of adult prisoners (Young, Moss, et al., 2015). Developmental trajectories vary (Bussing, Mason, Bell, Porter, & Garvan, 2010), but undiagnosed youth can face a range of adverse life outcomes (Mannuzza, Klein, & Moulton, 2008; Massetti et al., 2008; Peasgood et al., 2016; Salla et al., 2016; Thapar & Cooper, 2016). Most important to the current study is the trajectory to earlier and increased contact with the criminal justice system (CJS), where ADHD holds strong forensic relevance as well as notable implications for the investigative interviewing process (Young, Adamou, et al., 2011).

Forensic relevance of ADHD

Many children with ADHD display exhibitionist, impulsive and delinquent behaviour that contributes to early CJS contact, incarceration and perpetual reoffending (Goldstein, 2003; Lambie, Ione, Randell, & Seymour, 2013; Lindsay et al., 2013; Young, Adamou, et al., 2011; Young, Sedgwick, et al., 2015). ADHD-affected individuals recidivate more frequently and offend earlier than other recidivist offenders – and their condition is a strong predictor of earlier and elevated CJS contact and incarceration (DeLisi, Neppl, Lohman, Vaughn, & Shook, 2013; Gudjonsson, Wells, & Young, 2011; Young & Gudjonsson, 2007; Young, Wells, & Gudjonsson, 2011). In forensic settings, ADHD is one of the most frequently recorded psychiatric conditions (Einarsson, Sigurdsson, Gudjonsson, Newton, & Bragason, 2009; Lindsay et al., 2010; Young & Gudjonsson, 2005). Psychiatric comorbidity exists in almost 70% of cases (Gudjonsson, Sigurdsson, Sigfusdottir, & Young, 2014; Jensen et al., 2001; Young, Goodwin, Sedgwick, & Gudjonsson, 2013), which significantly increases the risk of CJS contact (Knecht, de Alvaro, Martinez-Raga, & Balanza-Martinez, 2015). Yet it is the ADHD symptoms that hold the most challenge at the point of entry to the CJS, which is at the interviewing stage (Erskine et al., 2016; Gudjonsson et al., 2016; Gudjonsson, Sigurdsson, Bragason, Newton, & Einarsson, 2008; Mohr-Jensen & Steinhausen, 2016; Storebol & Simonsen, 2016).

Impact of ADHD on investigative interviewing

ADHD impedes individuals' ability to manage their emotions and response styles during the investigative interviewing process (Gudjonsson, 2010, 2012; Gudjonsson & Pearce, 2011; Gudjonsson, Sigurdsson, Asgeirsdottir, & Sigfusdottir, 2006; Gudjonsson, Sigurdsson, Einarsson, Bragason, & Newton, 2010; Gudjonsson, Sigurdsson, Sigfusdottir, & Young, 2011; Gudjonsson,

Young, & Bramham, 2007; Kassin et al., 2010; Milne, Sharman, Powell, & Mead, 2013; Read, Powell, Kebbell, & Mine, 2009). ADHD behaviours may also lead the police to divert from protocols of best practice, and ineffective and/or inadmissible interviews can hold significant implications for the judicial process (Gudjonsson & Sigurdsson, 2010; Vrij, Granhag, & Porter, 2010).

Detectives have reported having a high level of contact with youth interviewees displaying ADHD behaviours, and perceive this contact to exert a highly significant impact on the time efficiency of and quality of information gathered during investigative interviews (Cunial & Kebbell, 2017). Consequently, there is a need to examine the investigative interviewing process for youth with ADHD more closely.

Investigative interviewing and the cognitive interview (CI)

The investigative interviewing process has four primary goals: obtaining maximum-quality information, minimizing the contamination of the interviewee's memory, minimizing any negative impacts on the interviewee and functioning with organizational mandates (Yuille, Marxsen, & Cooper, 1999). To assist with the interviewing process, Fisher and Geiselman (1992) devised the cognitive interview (CI) to provide a set of procedures for interviewing that draws on principles of cognitive and social psychology in order to maximize recall and facilitate communication.

The original CI was based heavily on mnemonics, such as Tulving and Thomson's (1973) encoding specificity principle of memory, emphasizing the manipulation of contextual factors at encoding in order to enhance retrieval. The process involved asking the interviewee to mentally reinstate or recreate the context of the event, including their physiological, cognitive and emotional states throughout; ('Mentally Recreate'), describe everything that could be remembered no matter how trivial in an unconstrained manner ('Report

Everything’), report all the facts again from a changed perspective (‘Change Perspective’) and recount the same facts again with the temporal order changed (usually in reverse chronological order; ‘Change Order’). The CI was later revised to include additional social components aimed at improving communication and facilitating a positive relationship between interviewer and interviewee, in order to promote the interviewee’s psychological health and maximize the extent of the quality information gathered (Fisher & Geiselman, 2010; Geiselman & Fisher, 2014). These components comprise rapport building (‘Establish Rapport’), transferring control of the interview to the interviewee (‘Transfer Control’), focused retrieval (i.e. using techniques such as imagery; ‘Use Imagery’), encouraging focused concentration (‘Encourage Concentration’) and the use of witness-compatible questioning (‘Compatible Questions’) as well as open questions (‘Open Non-Leading Questions’; (see Abbe & Brandon, 2013; Bensi, Nori, Gambetti, & Giusberti, 2011; Dando, Wilcock, & Milne, 2009; Powell, Fisher, & Wright, 2005; Powell & Guadagno, 2008; Read & Powell, 2011; Snow & Powell, 2005).

The CI is the most widely used set of structured interview techniques to obtain information as accurately as possible (Kohnken, Milne, Memon, & Bull, 1999; Lapaglia, Wilford, Rivard, Chan, & Fisher, 2014), and has been found to be highly effective in many countries, including Australia, Brazil, New Zealand, Portugal, the United Kingdom (UK) and the United States (US; see Paulo, Albuquerque, & Bull, 2013; Paulo, Albuquerque, Saraiva, & Bull, 2015; Stein & Memon, 2006). It has been shown to improve police practice by producing the most forensically relevant information (Colomb, Ginet, Wright, Demarchi, & Sadler, 2013; Dando, Wilcock, Behnkle, & Milne, 2011; Fisher, Milne, & Bull, 2011; Fisher, Ross, & Cahill, 2010; Griffiths & Milne, 2010; Westera, Kebbell, & Milne, 2011). The CI has been shown to be more effective at eliciting accurate memory reports from witnesses

relative to many alternative interviewing techniques, even when interviewees provide false information (Bembibre & Higuera, 2011; Memon, Meissner, & Fraser, 2010). It has also been shown to enhance witness recollection of relevant crime details reliably without sacrificing accuracy, relative to other methods of recall including the standard police interview, the structured interview and free recall (Akehurst, Milne, & Kohnken, 2003; Fisher, Geiselman, & Amador, 1989; Gabbert, Hope, & Fisher, 2009). Furthermore, this approach may improve police attitudes and victim satisfaction with the CJS (Westera & Powell, 2017).

Despite being positively rated on the whole, one of the main issues raised about the CI is the need to adapt it for use with certain groups (Dando, Wilcock, Milne, & Henry, 2009; Kebbell, Milne, & Wagstaff, 1999; Kebbell & Wagstaff, 1996; Oxburgh & Dando, 2011). The full CI has been criticized as cumbersome, complex and especially time consuming for certain types of vulnerable interviewees (Ceci, Bruck, & Battin, 2000; Dando et al., 2011; O’Mahony, Smith & Milne, 2011).

Cognitive interviewing and vulnerable interviewees

Although the CI has been shown to be effective with some vulnerable populations (Gentle, 2013; Milne & Bull, 1999, 2003; Milne et al., 2013), there are other vulnerable groups for which it is not always effective. Individuals with cognitive impairments caused by traumatic or acquired brain injury, intellectual disability or developmental disorders such as autistic spectrum disorder (ASD) may experience difficulties due to the executive functional deficits associated with their diagnosis (Ramos, Oddy, Liddement, & Fortescue, 2018; Stewart, Wilton, & Sapers, 2016; Young et al., 2013). In particular, the social components of the CI as well as the requirements to Mentally Recreate, Change Order and Change Perspective have all been implicated as problematic for such vulnerable interviewees (Maras & Bowler, 2010; Maras, Mulcahy,

Memon, Picariello, & Bowler, 2014). CI-trained officers have also reported reduced reliability and efficacy in applying some CI components, such as Change Perspective, Change Order and Mentally Recreate (Clarke & Milne, 2001; Dando, Wilcock, & Milne, 2008, 2009; Kebbell et al., 1999; Wright & Holliday, 2005).

The CI appears to be most effective with vulnerable populations when it is modified to adapt to their unique developmental and/or functional needs (Aldridge, 1999; Ceci & Bruck, 1993; Ceci et al., 2000; Holliday & Albon, 2004). Research has shown that the CI can be effectively modified to be shorter and have particular components eliminated, resulting in improved outcomes with vulnerable populations (Bensi et al., 2011; Brown, Lloyd-Jones, & Robinson, 2008; Dando et al., 2011; Davis, McMahon, & Greenwood, 2005; Milne & Bull, 2002). This has led to researchers focusing on assessing the efficacy of each individual component of the CI, and to the CI being adapted into a 'modified' cognitive interview (MCI) or 'enhanced' cognitive interview (ECI), widely used with success by police across a range of countries (Chan, McDermott, Watson, & Gallo, 2005; Kieckhafer, Vallano, & Compo, 2014; Paulo, Albuquerque, & Bull, 2016; Vallano & Compo, 2015; Vredeveltdt, Tredoux, Kempen, & Nortje, 2015). Yet it is essential to understand that each CI/ECI/MCI component comprises multiple mnemonics and instructions that can contribute differently to a superiority effect (Griffiths & Milne, 2010), and so it is important to investigate the efficacy of each component for a particular group of vulnerable interviewees. Of particular interest to the current study is the efficacy of each individual component when interviewing youth with ADHD, where there currently appears to be a lack of research.

Cognitive interviewing and ADHD

In a recent study, Cunial and Kebbell (2017) found that Australian detectives perceive the investigative interviewing process to be

significantly less effective in terms of the quality of the information gathered and time efficiency when used with youths presenting with ADHD-type behaviour compared to regular adolescent behaviour. However, it remains unknown how each specific component of the CI may be impacted by or suitably modified for such a diagnosis in youths. The wide-scale functional deficits associated with ADHD might lead one to expect that all the components of the interviewing process are potentially impacted for affected youth. Furthermore, based on the existing literature regarding the efficacy of particular CI components, it may be feasible to anticipate that the components Mentally Recreate, Change Order and Change Perspective will be highly impacted. Given the documented difficulties of these CI components when ASD is implicated and the recognized overlap in genetic (up to 72% shared genetic factors), cognitive and behavioural features of ASD and ADHD (see Tye et al., 2016; Van Steijn et al., 2012), it is reasonable to expect such components to be similarly problematic for ADHD-affected interviewees. Finally, given the key diagnostic criteria of ADHD emphasizing difficulties with attention, focus and concentration (American Psychiatric Association, 2013), it is feasible to expect that Encourage Concentration would also be highly problematic for this population.

The aim of this study is to address the knowledge gap regarding the use of the CI with youth with ADHD. The key objective was to investigate police perceptions regarding how specific components of the CI process may be impacted by ADHD-type behaviour in adolescent interviewees. It was hypothesized that the participating police officers would perceive all components of the CI as being more negatively impacted by ADHD-type interviewee behaviour compared to control interviewee behaviour. It was further hypothesized that police would perceive the Mentally Recreate, Change Order, Change Perspective and Encourage Concentration components

as being particularly negatively impacted by ADHD-type interviewee behaviour compared with the other components of the CI.

Method

Participants

A total of 102 Child Protection Investigation Unit (CPIU) detectives took part in this study. A sample size of at least 20 is suggested when using factorial vignettes and at least 30 to approximate the normal distribution, suggesting that the current sample is adequate (Snijders, 2004; Tilley, 1993). Of these detectives, 47 (46.1%) were attending CPIU or Interviewing Children and Recording Evidence (ICARE) training sessions at the police academy, and 55 (53.9%) were surveyed across six metropolitan CPIU police stations. The participants consisted of 59 males (57.8%) and 43 females (42.2%); 93 (91.2%) identified as Anglo-Australian, 2 (2.0%) as Asian Australian, 2 (2.0%) as New Zealanders, 2 (2.0%) as British, 1 (0.9%) as European, 1 (0.9%) as Fijian and 1 (0.9%) as Indian. The participants' ages ranged from 25 to 53 years ($M = 37.5$, $SD = 7.1$) and their duration of police service ranged from 3 to 30 years ($M = 10.8$, $SD = 5.9$). Service as a detective or plain-clothes investigator ranged from 0.1 to 23.0 years ($M = 4.9$, $SD = 5.2$). With regard to education, 9.8% have a post-graduate degree, 39.2% have a bachelor's degree, 40.2% have a diploma and 10.8% have a high school certificate.

Procedure

Data collection was matched across sessions and occurred via scheduled CPIU training courses at a police academy, in addition to researcher visits to six metropolitan CPIU police stations. This facilitated a contextual flow with natural incentives. The participants were advised that the purpose of the study is to identify areas for future training in the area of interviewing vulnerable youth. Each participant was given one of four survey booklets,

labelled 1 to 4 and distributed in counterbalanced rotating sequence. Each booklet contains four vignettes in counterbalanced order and requires the participants to respond to 10 Likert-type scale questions after each vignette, in addition to 6 demographic questions at the end of the booklet. The completion time was approximately 10 minutes.

Instrumentation

The four factorial vignettes used in this study were developed and validated in a previous study of police perceptions regarding youth interviewees with or without ADHD-type behaviour (Cunial & Kebbell, 2017). Each vignette describes a 17-year-old suspect or witness interviewee with or without ADHD-type behaviour. Two vignettes describe ADHD-type behaviour, one in a suspect and one in a witness interviewee, and two vignettes describe adolescent behaviour that does not meet the diagnostic criteria for ADHD, again one in a suspect and one in a witness interviewee.

After each vignette, the participants were asked to complete the same set of 10 questions with responses on a 10-point Likert-type scale. The 10 explicit components of the CI are addressed across 10 separate survey questions. The participants were asked to rate their perceptions of how the detective in the vignette, rather than themselves in a similar situation, might be impacted by the interviewee's behaviour. The questions are posed in this way in order to minimize social desirability response bias. The participants were asked to rate the degree to which they perceived that the interviewee's behaviour might impede the detective's ability to effectively conduct each component of the CI. Specifically, this includes the detective's ability to help the interviewee to mentally recreate the event, report everything, recall events in a different order, recall events from someone else's perspective and recall events using imagery. It further includes the detective's ability to establish rapport, transfer control to the interviewee,

Table 1. Means and standard deviations across conditions.

	Condition			
	ADHD suspect <i>M (SD)</i>	Control suspect <i>M (SD)</i>	ADHD witness <i>M (SD)</i>	Control witness <i>M (SD)</i>
Mentally Recreate	7.52 (1.85)	3.46 (1.78)	7.64 (1.89)	3.01 (1.93)
Report Everything	7.32 (1.84)	3.49 (1.77)	7.45 (1.94)	3.11 (2.02)
Transfer Control	7.05 (2.05)	3.32 (1.67)	7.36 (1.98)	3.20 (2.10)
Use Imagery	7.18 (1.94)	3.37 (1.79)	7.36 (2.00)	2.97 (1.88)
Change Order	7.50 (1.84)	3.45 (1.63)	7.63 (1.94)	3.12 (1.92)
Change Perspective	7.30 (2.13)	3.58 (1.79)	7.46 (1.80)	3.11 (1.85)
Establish Rapport	6.93 (1.99)	3.28 (1.83)	6.83 (2.17)	3.39 (2.22)
Compatible Questions	6.69 (2.21)	3.14 (1.67)	6.91 (2.22)	2.98 (1.90)
Open Non-Leading Questions	6.67 (2.59)	3.19 (1.73)	7.03 (2.42)	2.92 (1.90)
Encourage Concentration	7.62 (2.09)	3.84 (4.46)	7.79 (1.92)	3.06 (1.92)

use questions that are compatible with the interviewee, use open, non-leading questions and encourage focus and concentration. Finally, each booklet includes six basic demographic questions regarding age, gender, ethnicity, education level, years of police service and years of service as a detective or plain-clothes investigator.

Results

The data were analysed using within-subjects 2×2 analyses of variance (ANOVAs) to compare the participants' perceptions of the interviewees, in both the suspect and the witness conditions, who display the behavioural characteristics of either ADHD or normal adolescent behaviour (control). Specifically, the ANOVAs were used to examine the participants' perceptions of the impact of interviewee behaviour across the four conditions (ADHD/control X suspect/witness) on the 10 separate components of the CI: Mentally Recreate, Report Everything, Transfer Control, Use Imagery, Change Order, Change Perspective, Establish Rapport, Compatible Questions, Open Non-Leading Questions and Encourage Concentration. These were followed up with an analysis of the rated intensity of the impact of each CI component. Each of

these analyses, and then the overall findings taken together, are discussed in turn.

Perceived impact of interviewee behaviour on the 10 CI components

Table 1 shows the means and standard deviations for the ANOVAs regarding the participants' perceptions of the impact of interviewee behaviour (ADHD/control X suspect/witness) on the 10 components of the CI. The extent to which the participants perceived interviewee behaviour as impacting each of the 10 CI components was analysed using 10 individual 2X2 ANOVAs (ADHD/control X suspect/witness) with repeated measures on both factors.

Table 2 summarizes the results of the 10 ANOVAs. There is a significant effect of ADHD but no effect of suspect or witness condition for all 10 components. There is a significant interaction for five of the CI components: Mentally Recreate, Use Imagery, Change Perspective, Open Non-Leading Questions and Encourage Concentration. Each of these is now discussed in more depth. As a way of making the results easier to understand, they are separated into those with a main effect of ADHD and no interaction, and those where the interaction is significant.

Table 2. ANOVAs regarding the 10 CI components.

CI	<i>F</i>	<i>p</i>	η^2
<i>Mentally Recreate</i>			
ADHD/Control	355.59	<.001	.78
Suspect/Witness	1.71	>.05	.02
Interaction	4.35	<.05	.04
<i>Report Everything</i>			
ADHD/Control	314.95	<.001	.76
Suspect/Witness	1.07	>.05	.01
Interaction	3.03	>.05	.03
<i>Transfer Control</i>			
ADHD/Control	288.55	<.001	.74
Suspect/Witness	0.35	>.05	.00
Interaction	3.19	>.05	.03
<i>Use Imagery</i>			
ADHD/Control	364.22	<.001	.78
Suspect/Witness	0.53	>.05	.01
Interaction	5.27	<.05	.05
<i>Change Order</i>			
ADHD/Control	399.05	<.001	.80
Suspect/Witness	0.65	>.05	.01
Interaction	2.74	>.05	.03
<i>Change Perspective</i>			
ADHD/Control	343.48	<.001	.77
Suspect/Witness	1.54	>.05	.02
Interaction	5.41	<.05	.05
<i>Establish Rapport</i>			
ADHD/Control	260.69	<.001	.72
Suspect/Witness	0.01	>.05	.00
Interaction	0.56	>.05	.01
<i>Compatible Questions</i>			
ADHD/Control	286.87	<.001	.74
Suspect/Witness	0.06	>.05	.00
Interaction	2.66	>.05	.03
<i>Open Non-Leading Questions</i>			
ADHD/Control	244.25	<.001	.71
Suspect/Witness	0.13	>.05	.00
Interaction	7.22	<.01	.07
<i>Encourage Concentration</i>			
ADHD/Control	195.53	<.001	.66
Suspect/Witness	1.74	>.05	.02
Interaction	4.53	<.05	.04

Note: *df*(1, 101).

Main effects of the ADHD condition and the suspect/witness condition

For every CI component there is a significant effect of ADHD. In all cases, the presence of ADHD makes the CI components more

difficult to use. This main effect of ADHD is the case for the 5 CI components where there is no interaction, and is also the case for the 5 CI components where there is a significant interaction. There are no significant main

effects of the suspect or the witness condition for the 10 CI components.

Results with interactions, with the suspect perceived as more difficult than the witness in the control condition

Significant interactions were followed-up with *t*-tests ($p < .05$) between each cell and plots of the interactions. For Mentally Recreate there is a significant interaction, $F(1, 101) = 4.35$, $p < .05$, $\eta^2 = .04$. The interaction is explained by there being a significant difference between the suspect and the witness in the control condition, with the suspect ($M = 3.46$, $SD = 1.78$) being perceived as exerting a greater impact on the CI components than the witness ($M = 3.01$, $SD = 1.93$), and both being perceived as easier to interview than their counterparts in the ADHD condition.

A similar pattern was found with Use Imagery, where there is a significant interaction, $F(1, 101) = 5.27$, $p < .05$, $\eta^2 = .05$. Again, the interaction is explained by there being a significant difference between the suspect and the witness in the control condition, with the suspect ($M = 3.37$, $SD = 1.79$) being perceived as exerting a greater impact on the CI components than the witness ($M = 2.97$, $SD = 1.88$), and both being perceived as easier to interview than their counterparts in the ADHD condition. This is also the case with Change Perspective; there is a significant interaction, $F(1, 101) = 5.41$, $p < .05$, $\eta^2 = .05$, explained by the suspect ($M = 3.58$, $SD = 1.79$) being perceived as more difficult to interview than the witness ($M = 3.11$, $SD = 1.85$) in the control condition. Again, both were perceived as being easier to interview than their counterparts in the ADHD condition.

Results with interactions, with the witness perceived as more difficult than the suspect in the ADHD condition

Significant interactions were followed-up with *t*-tests ($p < .05$) between each cell and plots of

the interactions. When analysing Open Non-Leading Questions a significant interaction was found, $F(1, 101) = 7.22$, $p < .01$, $\eta^2 = .07$. The interaction is explained by the witness ($M = 7.03$, $SD = 2.42$) being perceived as exerting a greater impact on the CI components than the suspect ($M = 6.67$, $SD = 2.59$) in the ADHD condition. Both were also perceived as exerting a greater impact on the CI components than their counterparts in the control condition.

Results with interactions, with no differences in the ADHD or the control condition

Significant interactions were followed-up with *t*-tests ($p < .05$) between each cell and plots of the interactions. For Encourage Concentration there is a significant interaction, $F(1, 101) = 4.53$, $p < .05$, $\eta^2 = .04$. However, there is no significant difference between suspect versus witness interviewees within the ADHD, $t(101) = 1.06$, $p > .05$, or the control, $t(101) = 1.85$, $p > .05$, conditions. The suspect and the witness in the ADHD condition were both perceived to exert a higher impact than their counterparts in the control condition.

Taken together, the ANOVAs and follow-up *t*-tests show that the participants perceived the behaviour described in the ADHD condition, when compared with the control condition, as exerting a highly significant impact on all 10 CI components. The ANOVAs further show a significant interaction for 5 of the CI components: Mentally Recreate, Use Imagery, Change Perspective, Open Non-Leading Questions and Encourage Concentration. The *t*-tests show that for Open Non-Leading Questions the participants perceived the witness with ADHD as exerting a greater impact than the suspect with ADHD. Regarding the control condition, the participants perceived the suspect as exerting a greater impact than the witness for Mentally Recreate, Use Imagery and Change Perspective. Despite a significant interaction for Encourage Concentration, the *t*-tests revealed no

differences between the suspect and the witness in either the ADHD or the control condition.

Rated intensity of the perceived impact across the CI components

As an alternative method of conceptualizing the data concerning ADHD, a one-way ANOVA was used to establish whether or not the participants perceived the intensity of the impact as varying across the 10 CI components. For this analysis, the suspect and witness ADHD conditions were combined to make a single variable for each component. This was found to be significant, $F(9, 93) =$

Table 3. Means and standard deviations across the CI components, rank ordered, for the combined ADHD condition.

CI components, rank ordered	<i>M (SD)</i>
Encourage Concentration (EC)	7.71 (1.82)
Mentally Recreate (MR)	7.58 (1.66)
Change Order (CO)	7.56 (1.66)
Report Everything (RE)	7.39 (1.66)
Change Perspective (CP)	7.38 (1.72)
Use Imagery (UI)	7.27 (1.67)
Transfer Control (TC)	7.21 (1.79)
Establish Rapport (ER)	6.88 (1.85)
Open/Non-Leading Questions (ONLQ)	6.85 (2.34)
Compatible Questions (CQ)	6.80 (1.99)

4.98, $p < .001$, $\eta^2 = .33$. Table 3 shows the means and standard deviations of the CI components, ranked in order of perceived intensity of impact. The analysis of the combined ADHD condition was followed-up with paired t -tests to show the significant differences. The results are displayed in Table 4 and broadly correspond with the order in which the components are ranked. The participants rated Encourage Concentration, Mentally Recreate and Change Order as the most intensely impacted by ADHD-type behaviour. These CI components are significantly different from almost all the other components. Similarly, the participants rated the CI components Establish Rapport, Open Non-Leading Questions and Compatible Questions as the least impacted by ADHD-type behaviour.

Discussion

Overall findings

Taken together, the overall findings from the analyses show that the detectives who participated in this study perceived the ADHD-type behaviour in the suspect and the witness as exerting a highly significant impact on all 10 components of the CI. The deeper analyses show that despite the ADHD-type behaviour being rated as highly impactful on all 10 CI components, there is a significant difference in the detectives' perceived severity of impact across the components. When the 10

Table 4. T -scores comparing the 10 CI components across the combined ADHD condition.

CI component	EC	MR	CO	RE	CP	UI	TC	ER	ONLQ	OQ
Encourage Concentration	—	1.15	1.28	2.60*	2.34*	3.72***	3.58**	5.24***	4.18***	5.63***
Mentally Recreate		—	0.16	2.08*	1.64	2.54*	2.48*	4.26***	3.26**	4.55***
Change Order			—	1.85	1.91	2.47*	2.78**	4.54***	3.46**	4.88***
Report Everything				—	0.04	0.90	1.42	3.80***	2.58*	3.46***
Change Perspective					—	0.87	1.11	2.65**	2.40*	3.60***
Use Imagery						—	0.43	2.55*	2.10*	3.31***
Transfer Control							—	2.63**	2.24*	3.34***
Establish Rapport								—	0.19	0.53
Open/Non-Leading Questions									—	0.33
Compatible Questions										—

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

components are ranked in order of severity of perceived impact, the detectives perceived Encourage Concentration, Mentally Recreate and Change Order, compared with the other seven CI components, as sustaining the greatest impact during the interview process – and they perceived Establish Rapport, Open Non-Leading Questions and Compatible Questions, compared with the other seven CI components, as sustaining the least impact during the interview process. Thus, overall, the detectives perceived the ADHD-type behaviour as exerting a highly significant impact on all 10 CI components, but especially on Encourage Concentration, Mentally Recreate and Change Order. These findings support the first hypothesis, that the ADHD-type behaviour would impact all 10 CI components. The second hypothesis, that the most impacted CI components would include Encourage Concentration, Mentally Recreate, Change Order and Change Perspective, is partially supported; whilst Encourage Concentration, Mentally Recreate and Change Order are rated as significantly more impacted compared with the other CI components, Change Perspective is ranked further down the list of influenced components.

Explaining the key findings

This study is the first to measure police perceptions regarding the impact of ADHD in youth interviewees on the different components of the CI. The finding that the detectives perceived all the CI components as being significantly more impacted in the ADHD condition than in the control condition is in line with the literature, which highlights that the wide-scale functional deficits associated with ADHD are the most problematic and demanding in terms of police resources in the interviewing process – even when controlling for comorbidity with other disorders (Dalsgaard, Mortensen, Frydenberg, & Thomsen, 2013; Gudjonsson et al., 2008, 2016; Gudjonsson, Sigurdsson, Adalsteinsson, & Young, 2012; Young et al., 2013). These findings also align with and extend upon recent research showing

that Australian detectives report that the youth interviewees they encounter in their own work who exhibit ADHD-type behaviour – similar to that described in the vignettes herein – have a highly significant impact on the interviewing process in terms of time efficiency and the quality of the information gathered (Cunial & Kebbell, 2017).

As discussed previously, research shows that the brain abnormalities associated with ADHD contribute to executive function deficits in attention, working memory, impulse control, planning, problem-solving, judgement and decision-making (see Barkley, 2015; Bruchmuller et al., 2012; DosReis et al., 2010; Garfield et al., 2012). These wide-scale executive function deficits not surprisingly appear to impact all areas of the CI. Furthermore, as previously mentioned, the development of the CI is based heavily on mnemonics, and in particular on the manipulation of contextual factors at encoding in order to enhance retrieval (see Tulving and Thomson, 1973). This may present particular challenges for youth with ADHD given their well-documented difficulties with working memory, where they are required to hold information in short-term memory and manipulate it (see Kim, Liu, Gilzer, Tannock, & Woltering, 2014; Weigard & Huang-Pollock, 2017). So significant is working memory to ADHD-affected individuals that research has suggested that this impairment contributes heavily to their other executive function deficits, such as attention (Tillman, Eninger, Forssman, & Bohlin, 2011), impulsivity (Raiker, Rapport, Kofler, & Sarver, 2012) and hyperactivity (Rapport et al., 2009), and that these areas improve if working memory improves (Beck, Hanson, Puffenberger, Benninger, & Benninger, 2010; Van der Oord, Ponsioen, Geurts, Brink, & Prins, 2012).

The significance of working memory implications for youth with ADHD may also best explain the findings of this study that Mentally Recreate and Change Order were rated by the detectives as sustaining a

particularly strong impact during the interview process. These CI components are more cognitively demanding and draw particularly heavily on memory encoding and retrieval, requiring the interviewee to hold information in his or her mind and manipulate it by using working memory. These components also appear to require the interviewee to demonstrate freedom from distractibility and impulsivity – another key diagnostic feature of ADHD if impaired (American Psychiatric Association, 2013) – in order to mentally manipulate their reinstatement and temporal ordering. This is also consistent with previous research showing Mentally Recreate – as well as Change Order and Change Perspective – to be problematic for many CI-trained police officers, in particular when interacting with vulnerable groups such as those on the autistic spectrum who share similar cognitive deficits to those with ADHD (Clarke & Milne, 2001; Dando et al., 2008; Dando, Wilcock, & Milne, 2009; Kebbell et al., 1999; Maras & Bowler, 2010; Maras et al., 2014; Tye et al., 2016; Wright & Holliday, 2005). The CI component Change Perspective was hypothesized as being particularly salient in relation to the current study, but is not ranked as highly as the above-mentioned components. This is surprising, given that research has shown youth with ADHD to have impaired perspective taking, as well as showing weak working memory again to be the strongest predictor of this deficit (Nilsen & Bacso, 2017). It is possible that the research regarding the particularly strong difficulties associated with Change Perspective for ASD-affected interviewees may perhaps be explained by the fact that impaired perspective-shifting is especially salient in this population (Hashimoto et al., 2016) and a key criterion for their diagnosis (American Psychiatric Association, 2013). Nevertheless, the CI component Change Perspective was still rated by the detectives as being impacted by ADHD-type behaviour to a highly significant degree.

The key diagnostic feature of inattention in ADHD (American Psychiatric Association, 2013) appears to be the most problematic for the detectives, whereby Encourage Concentration is ranked as sustaining the greatest perceived impact compared with the other nine CI components. If detectives are unaware that an interviewee has a diagnosis of ADHD and/or the attentional difficulties associated with it, and most importantly are unaware of how to best accommodate such deficits, it is understandable that they would find it extremely difficult to encourage concentration during a CI.

Limitations

Whilst 102 is considered a sizable sample given the niche area from which the participants were drawn (CPIU detectives), a larger sample size perhaps utilizing a wider catchment area may have offered increased power and flexibility for supplementary analyses controlling for education and years of service.

Furthermore, the vignettes may have provided less contextual information than natural settings and made it difficult for the detectives to make decisions. Some researchers criticize vignettes based on the potential for vignette equivalence, response consistency and failure to capture subtle social nuances (King & Wand, 2007; Ludwick et al., 2004; Ludwick & Zeller, 2001; Ohan, Visser, Strain, & Allen, 2011). However, other researchers commend vignettes for their broad applicability, flexibility, high statistical power and validity, consideration to respondent characteristics and utility in situations that are highly sensitive, challenging, demand critical thinking and/or require specific decisions and actions (Collett & Childs, 2011; Ganong & Coleman, 2006; Kish, 2007; Lee, 1993; Stokes & Schmidt, 2012; Taylor, 2006; Tolsma & Blaauw, 2012; Twemlow, Fonagy, Saaco, & Vernberg, 2008; Wallander, 2012).

A final limitation relates to potential complications where comorbidity may exist, particularly with oppositional defiant disorder and

other conduct disorders. Some researchers suggest that such comorbidity may better explain risk for criminality and recidivism, but these studies are noted to have considerable methodological and statistical limitations (see Grieger & Hosser, 2012; Gudjonsson et al., 2014; Mordre, Groholt, Kielsberg, Sandstad, & Myhre, 2011; Satterfield et al., 2007). Other researchers argue that ADHD precipitates the comorbid trajectory – that it is the ADHD-based deficits in attention, impulse control and self-control which most predict criminality, and that recidivism significantly reduces with stimulant medication regardless of coexisting diagnoses (Beauchaine et al., 2013; Beauchaine, Hinshaw, & Pang, 2010; Beauchaine & McNulty, 2013; Eme, 2012, 2013, 2014; Gudjonsson et al., 2010; Lichenstein et al., 2012; Moffitt, Poulton, & Caspi, 2013; Zhou et al., 2014). Of particular interest is that cognitive impairments in offenders are recognized as often occurring outside of the developmental period, as a consequence of substance abuse or involvement in violence due to impulse control difficulties (see Stewart et al., 2016). Most importantly, as previously discussed, ADHD is most demanding of police resources compared with other diagnoses – and whilst comorbidity adds a level of complexity, the functional deficits associated with ADHD should not be discounted (see Vogel, 2014; Young et al., 2013).

Implications

Potential for miscarriage of justice

These findings taken together suggest that detectives perceive ADHD as exerting a highly significant impact on all 10 components of the CI, which may potentially contribute to a miscarriage of justice. It may be surmised that the CI in its typical form, without additional modifications or considerations, may be problematic for youth with ADHD. As discussed previously, the functional deficits associated with ADHD can impact upon the CI in multiple ways that hold considerable implications for the judicial process – and Australian

detectives report encountering youth with ADHD-type behaviours frequently in their work. Furthermore, research shows that the ADHD diagnosis is a frequently occurring yet often missed (in up to 42% of cases) problem for youth coming into contact with the CJS (see Buitelaar & Ferdinand, 2016). Thus there may potentially be a large number of cases where the judicial process is being significantly impacted due to a gap in knowledge regarding how to recognize and accommodate ADHD during the investigative interviewing process.

Training for detectives

When interviewing vulnerable individuals such as youth with ADHD, or with cognitive impairment more broadly, it is advisable to consider the implications of developmental research and supplementary techniques for overcoming developmental barriers (Lamb, La Rooy, Malloy, & Katz, 2011; Steward, Bussey, Goodman, & Saywitz, 1993). Interviewing children and adolescents in forensic settings requires an understanding of specialized knowledge that is not often taught in training programmes, which cover a range of considerations in questioning techniques, sensitivity, objectivity, flexibility, suggestibility and response interpretation, all within a developmental framework (Saywitz & Camparo, 1998).

The findings of the current study affirm this position, and highlight a strong need for additional detective training – particularly regarding ADHD and how to recognize, understand, accommodate and refer to early intervention those affected youth coming into contact with the CJS. The fact that all 10 components of the CI are perceived to be highly affected by ADHD suggests a need for a comprehensive training programme targeting the whole CI within a developmental framework. In particular, the CI components Encourage Concentration, Mentally Recreate and Change Order are especially salient and may require

additional consideration and support in such a training programme.

Detective training in Australia and the UK currently occurs via a tiered approach, with Level Three training focusing on a range of separate courses aimed at equipping officers with skills for interviewing vulnerable populations (see Griffiths & Milne, 2006). Such specialized intensive training courses have been shown to be effective across a range of areas, including sexual offences, mental illness, intellectual impairment and the use of intermediaries (see Darwinkel, Powell, & Tidmarsh, 2013; Herrington & Pope, 2014; O'Mahony et al., 2011). The findings of the current study provide a rationale for an additional specialized intensive training course under Tier/Level Three which specifically addresses using the CI with ADHD-affected youth.

Future research

It is widely recognized that the heightened proportion of ADHD-affected individuals coming into contact with the CJS is not paralleled by the expertise and training of the detectives engaging them in the investigative interviewing process. This is an important area for future research, so that a specialized training programme may be developed. However, in order to understand the best way to deliver such a training programme, further knowledge and understanding is required with reference to detectives' perceived training needs, preferences and existing training availability, as well as the optimal models and modalities for the programme itself. There currently appears to be an absence of research in this area in relation to ADHD.

In addition to carrying out further research on future detective training, research also needs to be conducted on ways to raise awareness of the needs of ADHD-affected youth at every stage of the judicial pathway. Further research regarding ways to facilitate a multi-systemic collaborative approach between key personnel within the CJS, as well as the health and education sectors, would be beneficial.

Conclusion

This study has revealed that detectives perceive ADHD-type behaviour, compared with the behaviour described in the control condition, as exerting a highly significant impact on all 10 components of the CI. There is also a significant difference in the level of impact detectives rated for each CI component: Encourage Concentration, Mentally Recreate and Change Order were rated as the three most problematic components, while Establish Rapport, Open Non-Leading Questions and Compatible Questions were rated as significantly easier to implement compared with the other components. These findings suggest the need for a specialized comprehensive training programme for detectives on how to recognize and accommodate ADHD-affected youth during the investigative interviewing process.

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Ethical standards

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Conflict of Interest

No potential conflict of interest was reported by the authors.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Griffith University Human Research Ethics Committee and the Queensland Police Service Research 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

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