POLICE PERCEPTIONS OF ADHD IMPACT ON THE COGNITIVE INTERVIEW WITH YOUTH

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) in youth witness-victims/suspects holds significant consequences for the investigative interviewing process. One hundred and two Child Protection Investigation Unit (CPIU) detectives were asked to read four vignettes that concerned adolescents being interviewed by the police. Two interviews concerned adolescents as witnesses and two concerned adolescents as suspects. The vignettes were designed so that one witness and one suspect displayed ADHD behaviour. Detectives were asked to rate the degree to which the behaviour in each vignette would impact the interviewer’s ability to use the ten key components of the Cognitive Interview (CI). Detectives perceived ADHD-type interviewee behaviour to negatively impact the ability to use all ten CI components, to a highly significant degree. There was also a significant difference between detectives’ rated severity of each CI component. Detectives rated “Encourage Concentration”, “Mentally Recreate” and “Change Order”, respectively, as exerting the strongest impact on the interviewing process. The authors discuss implications for further research on police perceptions of training options, needs and preferences regarding youth interviewees with ADHD.

Keywords: ADHD, cognitive interview, police, youth, vignette
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 contributing to executive function deficits in attention, working memory, impulse control, planning, problem-solving, judgment and decision-making (see 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) rates 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 (see Mannuzza, Klein & Moulton, 2008; Massetti et al., 2008; Peasgood et al., 2016; Salla et al., 2016; Thapar & Cooper, 2016). Most important to the current paper 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 contribute to early CJS contact, incarceration and perpetual re-offending (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, offend earlier than other recidivist offenders, and their condition is the strongest 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 (see Jensen et al., 2001; Gudjonsson, Sigurdsson, Sigfusdottir, & Young, 2014; Young, Goodwin, Sedgwick & Gudjonsson, 2013), which significantly increases 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 CJS, which is at the interviewing stage (see Erksine et al., 2016; Gudjonsson, Sigurdsson, Bragason, Newton & Einarsson, 2008; Gudjonsson, Sigurdsson, Sigfusdottir, Asgeirsdottir, Gonzalez & Young, 2016; 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 & Pearse, 2011; Gudjonsson, Sigurdsson, Asgeirsdottir & Sigfusdottir, 2006; Gudjonsson, Sigurdsson, Sigfusdottir, & Young, 2011; Gudjonsson, Sigurdsson, Einarsson, Bragason, & Newton, 2010; Gudjonsson, Young & Braham, 2007; Kassin et al., 2010; Milne, Sharman, Powell, & Mead, 2013; Read, Powell, Kebbell & Milne, 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 and quality of information gathered during investigative interviews (Cunial & Kebbell, 2017). Consequently, there is a need to more closely examine the investigative interviewing process for youth with ADHD.
Investigative Interviewing and the Cognitive Interview

The investigative interviewing process has four primary goals that include obtaining maximum quality information, minimizing contamination of interviewee memory, minimizing negative impacts on the interviewee, and functioning with organizational mandates (Yuille, Marxsen & Cooper, 1999). To assist 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 Tulving and Thompson’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/recreate the context of the event (including their physiological, cognitive and emotional states throughout) (“Mentally Recreate”), to describe everything they can remember no matter how trivial in an unconstrained manner (“Report Everything”), to report all the facts again from a changed perspective (“Change Perspective”), and to 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 the interviewer and interviewee, in order to promote the interviewee’s psychological health and maximize the extent of quality information gathered (Fisher & Geiselman, 2010; Geiselman & Fisher, 2014). These components include rapport building (“Establish Rapport”), transfer of control of the interview to the interviewee (“Transfer Control”), focused retrieval (i.e. using techniques such as imagery) (“Use Imagery), “Encourage Concentration”, witness-compatible questioning (“Compatible Questions”), as well as “Open Non-Leading Questions” (see Abbe & Brandon, 2013; Bensi, Nori, Gambetti, & Giusberti, 2011; Dando,
Wilcock & Milne, 2009; Powell, Fisher, & Wright, 2005; Powell & Guadagno, 2008; Reed & 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 as well as the UK and USA (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 et al., 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 & Higueras, 2011; Memon, Meissner & Fraser, 2010). It has also been shown to reliably enhance witness recollection of relevant crime details without sacrificing accuracy relative to other methods of recall, including the standard police interview, 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 in 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 et al., 2000; Dando, Wilcock, Behnkle, & Milne, 2011; O’Mahony et al., 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 vulnerable groups for whom the CI is not always effective. Individuals with cognitive impairments, due to 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 (i.e. see Ramos, Oddy, Liddemant & Fortescue, 2017; Stewart, Wilton & Sapers, 2016; Young, Goodwin, et al., 2013). In particular, the social components of the CI as well as the requirement to “Mentally Recreate”, “Change Order” and “Change Perspective” have been implicated as problematic for such vulnerable interviewees (see 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, Milne & Wagstaff, 1999; Wright & Holliday, 2005).

The CI appears most effective with vulnerable populations when modified to adapt to their unique developmental and/or functional needs (Aldridge, 1999; Ceci & Bruck, 1993; Ceci, Bruck & Battin, 2000; Holliday & Albon, 2004). Research has shown the CI can be effectively modified to be shorter and to have particular components eliminated, with improved outcomes (Bensie, Nori, Gambetti & Giusberti, 2011; Brown, Lloyd-Jones & Robinson, 2008; Dando, Wilcock, Behnkle, & Milne, 2011; Davis, McMahon & Greenwood, 2005; Milne & Bull, 2002). This has lead researchers to focus on assessing the efficacy of each individual component of the CI, and for the CI to be adapted into a “modified” or “enhanced” cognitive interview (MCI/ECI), widely used with success by police across a range of countries (see Chan, McDermott, Watson & Gallo, 2005; Kieckhaefer, Vallano &
Compo, 2014; Paulo, Albuquerque & Bull, 2016; Vallano & Compo, 2015; Vredeveldt, 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 paper 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**

A recent study (Cunial & Keibbell, 2017) found that Australian detectives perceived youths presenting with ADHD-type behaviour, compared with regular adolescent behaviour, to have a significant impact on the investigative interviewing process in terms of quality of information gathered and time efficiency. However, it remains unknown how each specific component of the CI may be impacted by or suitably modified for such a diagnosis in youth. The wide-scale functional deficits associated with ADHD would lead one to expect that all components of the interviewing process may be impacted for affected youth. Furthermore, based on existing literature regarding the efficacy of particular CI components, it may be feasible to anticipate the components “Mentally Recreate”, “Change Order”, and “Change Perspective” to be highly impacted. Given the documented difficulties of these CI components when ASD is implicated, and the recognised 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 would be feasible to expect that “Encourage Concentration” would be highly problematic for this population.
The aim of this study was to address the knowledge gap regarding cognitive interviewing for 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 police would perceive all components of the CI to be more negatively impacted by ADHD type interviewee behaviour, compared with control interviewee behaviour. It was further hypothesized that police would perceive the “Mentally Recreate” “Change Order”, “Change Perspective” and “Encourage Concentration” components, compared with other components of the CI, to be more significantly more impacted by ADHD-type interviewee behaviour.

**Method**

**Participants**

The participants were 102 Child Protection Investigation Unit (CPIU) detectives. A sample size of at least 20 is suggested when using factorial vignettes, and of at least 30 to approximate the normal distribution, suggesting the current sample was adequate (Snijders, 2004; Tilley, 1993). Of these detectives, 47 (46.1%) were attending CPIU or ICARE (Interviewing Children and Recording Evidence) training sessions at the police academy. Another 55 (53.9%) participants were surveyed across six metropolitan CPIU police stations. There were 59 males (57.8%) and 43 females (42.2%). Regarding ethnicity, 93 (91.2%) identified as Anglo-Australian, 2 (2%) as Asian-Australian, 2 (2%) New Zealand, 2 (2%) British, 1 (1%) European, 1 (1%) Fijian, and 1 (%) Indian. Age ranged from 25 to 53 years, with a mean of 37.5 (S.D = 7.1). Police service ranged between 3 and 30 years, with a mean of 10.8 (S.D = 5.9). Service as a detective or plain clothed investigator ranged between 0.1 and 23 years, with a mean of 4.9 (S.D = 5.2). With regards to education, 9.8% had a postgraduate degree, 39.2% held a bachelor degree, 40.2% held a diploma, and 10.8% had a high-school certificate.
Procedure

The Griffith University Human Research Ethics Committee, as well as the Queensland Police Service Research Committee, approved the current project. 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. Detectives were advised that the purpose of the study was to identify areas for future training in the area of interviewing vulnerable youth. Each detective was given a survey booklet, labelled 1-4 and distributed in counterbalanced rotating sequence. Each booklet contained four vignettes with counterbalanced order, and required detectives to respond to 10 Likert-type scale questions after each vignette in addition to six demographic questions at the end of the booklet. 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/without ADHD type behaviour (Cunial & Kebbell, 2017). Each vignette described a 17 year-old suspect/witness interviewee with/without ADHD type behaviour. Two vignettes described ADHD-type behaviour, one in a suspect and one in a witness interviewee. Two vignettes described adolescent behaviour that would not meet diagnostic criteria for ADHD, in a suspect and in a witness interviewee.

After each vignette, detectives were asked to complete the same set of ten questions with responses on a ten-point Likert-type scale. Ten explicit components of a cognitive interview were addressed across ten separate survey questions. The questions asked respondents to rate their perceptions of how the detective in the vignette, rather than themselves, may be impacted by the interviewee behaviour. Questions were posed in this way
to minimize social desirability response bias. The questions asked the respondents to rate the degree to which they perceived the interviewee’s behaviour may impede the detective’s ability to effectively conduct each component of the cognitive interview. Specifically, this included the detective’s ability to help the interviewee mentally recreate the event, report everything, recall events in different orders, recall from someone else’s perspective, and recall using imagery. It further included the detective’s ability to establish rapport, transfer control to the interviewee, use questions compatible with the interviewee, encourage focus and concentration, as well as to use open non-leading questions. Finally, each booklet included six basic demographic questions, regarding age, gender, ethnicity, education level, years of police service, as well as years of service as a detective or plain clothes investigator.

Results

The data were analysed with within-subjects 2 X 2 ANOVAs comparing detectives’ perceptions regarding interviewees, in both suspect and witness conditions, who display behaviour characteristics of either ADHD or no diagnosis (control). Specifically, the ANOVAs were used to examine detectives’ perceptions of the impact of interviewee behaviour, across the four conditions (ADHD/control X suspect/witness), on ten separate components of the CI. These components were “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 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 Ten CI Components

Table 1 shows the means and standard deviations for the ANOVAs, regarding detectives’ perceptions of interviewee behaviour (ADHD/control X suspect/witness) on the


ten components of the CI. The extent to which detectives perceived interviewee behaviour to impact each of the ten CI components was analysed using ten individual 2 X 2 ANOVAs (ADHD/control X suspect/witness) with repeated measures on both factors.

Table 1
*Means and Standard Deviations Across Conditions*

<table>
<thead>
<tr>
<th>Component</th>
<th>ADHD Suspect M (SD)</th>
<th>ADHD Witness M (SD)</th>
<th>Control Suspect M (SD)</th>
<th>Control Witness M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mentally Recreate</td>
<td>7.52 (1.85)</td>
<td>7.64 (1.89)</td>
<td>3.46 (1.78)</td>
<td>3.01 (1.93)</td>
</tr>
<tr>
<td>Report Everything</td>
<td>7.32 (1.84)</td>
<td>7.36 (1.98)</td>
<td>3.49 (1.77)</td>
<td>3.11 (2.02)</td>
</tr>
<tr>
<td>Transfer Control</td>
<td>7.05 (2.05)</td>
<td>7.30 (2.00)</td>
<td>3.32 (1.67)</td>
<td>3.20 (2.10)</td>
</tr>
<tr>
<td>Use Imagery</td>
<td>7.18 (1.94)</td>
<td>7.46 (1.80)</td>
<td>3.37 (1.79)</td>
<td>2.97 (1.88)</td>
</tr>
<tr>
<td>Change Order</td>
<td>7.50 (1.84)</td>
<td>7.63 (1.94)</td>
<td>3.45 (1.63)</td>
<td>3.12 (1.92)</td>
</tr>
<tr>
<td>Change Perspective</td>
<td>7.30 (2.13)</td>
<td>6.83 (2.17)</td>
<td>3.58 (1.79)</td>
<td>3.11 (1.85)</td>
</tr>
<tr>
<td>Establish Rapport</td>
<td>6.93 (1.99)</td>
<td>6.91 (2.22)</td>
<td>3.28 (1.83)</td>
<td>3.39 (2.22)</td>
</tr>
<tr>
<td>Compatible Questions</td>
<td>6.69 (2.21)</td>
<td>6.03 (2.42)</td>
<td>3.14 (1.67)</td>
<td>2.98 (1.90)</td>
</tr>
<tr>
<td>Open Non-Leading Questions</td>
<td>6.67 (2.59)</td>
<td>7.03 (2.42)</td>
<td>3.19 (1.73)</td>
<td>2.92 (1.90)</td>
</tr>
<tr>
<td>Encourage Concentration</td>
<td>7.62 (2.09)</td>
<td>7.79 (1.92)</td>
<td>3.84 (4.46)</td>
<td>3.06 (1.92)</td>
</tr>
</tbody>
</table>

Table 2 summarises the results of the ten ANOVAs. There was a significant effect of ADHD, and no effect of suspect or witness condition, for all ten components. There was a significant interaction for five of the CI components, including “Mentally Recreate”, “Use Imagery”, “Change Perspective”, “Open Non-Leading Questions”, and “Encourage Concentration”. We will now discuss each in turn in more depth. As a way of making the results easier to understand we have separated the results into those with a main effect of ADHD and no interaction, and those where the interaction was significant.
Table 2
ANOVA Regarding the Ten CI Components

<table>
<thead>
<tr>
<th>CI</th>
<th>ADHD/Control</th>
<th>Suspect/Witness</th>
<th>Interaction</th>
<th>F</th>
<th>p</th>
<th>$\eta^2$</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mentally Recreate</td>
<td>355.59</td>
<td>1.71</td>
<td>4.35</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.78</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Report Everything</td>
<td>314.95</td>
<td>1.07</td>
<td>3.03</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.76</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Transfer Control</td>
<td>288.55</td>
<td>.35</td>
<td>3.19</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.74</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Use Imagery</td>
<td>364.22</td>
<td>.53</td>
<td>5.27</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.78</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Change Order</td>
<td>399.05</td>
<td>.65</td>
<td>2.74</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.80</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Change Perspective</td>
<td>343.48</td>
<td>1.54</td>
<td>5.41</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.77</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Establish Rapport</td>
<td>260.69</td>
<td>.01</td>
<td>.56</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.72</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Compatible Questions</td>
<td>286.87</td>
<td>.06</td>
<td>2.66</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.74</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Open Non-Leading Questions</td>
<td>244.25</td>
<td>.13</td>
<td>7.22</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.71</td>
<td>(1,101)</td>
</tr>
<tr>
<td>Encourage Concentration</td>
<td>195.53</td>
<td>1.74</td>
<td>4.53</td>
<td>&lt;.001</td>
<td>&gt;.05</td>
<td>.66</td>
<td>(1,101)</td>
</tr>
</tbody>
</table>
Main effects of ADHD condition, and suspect-witness condition. For every CI component there was a significant effect of ADHD. In all cases, the presence of ADHD made the CI components more difficult to use. This main effect of ADHD was the case for the five CI components where there was no interaction, and also the case for the five CI components where there was a significant interaction. There were no significant main effects of suspect or witness condition for the ten CI components.

Results with interactions, with suspects perceived to be more difficult than witnesses in the control conditions. Significant interactions were followed-up with t-tests ($p<.05$) between each cell and plots of the interactions. For “Mentally Recreate” there was a significant interaction, $F(1,101)=4.35$, $p<.05$, $\eta^2=.04$. The interaction was explained by there being a significant difference between suspects and witnesses in the control condition with suspects ($M=3.46$, $SD=1.78$) perceived to exert a greater impact than witnesses ($M=3.01$, $SD=1.93$) and both being perceived to be easier than the ADHD condition.

A similar pattern was found with “Use Imagery”, where there was a significant interaction, $F(1,101)=5.27$, $p<.05$, $\eta^2=.05$. Again, the interaction was explained by there being a significant difference between suspects and witnesses in the control condition with suspects ($M=3.37$, $SD=1.79$) perceived to exert a greater impact than witnesses ($M=2.97$, $SD=1.88$) and both being perceived to be easier than the ADHD condition. This was also the case with “Change Perspective”. There was a significant interaction, $F(1,101)=5.41$, $p<.05$, $\eta^2=.05$, explained by suspects ($M=3.58$, $SD=1.79$) being perceived as more difficult than witnesses ($M=3.11$, $SD=1.85$) in the control condition. Again, both were perceived to be easier than the ADHD condition.

Results with interactions, with witnesses perceived to be more difficult than suspects in the ADHD condition. Significant interactions were followed-up with t-tests ($p<.05$) between each cell and plots of the interactions. When analyzing “Open Non-Leading
Questions”, there was a significant interaction, $F(1,101)=7.22, p<.01, \eta^2=.07$. The interaction was explained by witnesses ($M=7.03, SD=2.42$) perceived to have exerted a greater impact than suspects ($M=6.67, SD=2.59$) in the ADHD condition. Both were higher than the control conditions.

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

Significant interactions were followed-up with $t$-tests ($p<.05$) between each cell and plots of the interactions. For “Encourage Concentration”, there was a significant interaction, $F(1,101)=4.53, p<.05, \eta^2=.04$. However, there was 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. Suspects and witnesses were both perceived to exert a higher impact in the ADHD condition than the control condition.

Taken together, the ANOVAs and follow-up $t$-tests show that detectives perceive the behaviour described in the ADHD condition, compared with the control condition, to exert a highly significant impact on all ten CI components. The ANOVAs further show a significant interaction for five of the CI components, including “Mentally Recreate”, “Use Imagery”, “Change Perspective”, “Open Non-Leading Questions” and “Encourage Concentration. The $t$-tests showed that for “Open Non-Leading Questions”, detectives perceived witnesses with ADHD to exert a stronger impact than suspects with ADHD. Regarding the control condition, detectives perceived suspects to exert a greater impact than witnesses for “Mentally Recreate”, “Use Imagery” and “Change Perspective”. Despite a significant interaction for “Encourage Concentration”, $t$-tests revealed no differences between suspects and witnesses in either the ADHD or the control conditions.

**Rated Intensity of Perceived Impact Across the CI Components**

As another way of conceptualizing the data concerning ADHD, a one-way ANOVA was used to establish whether detectives perceived the ten CI components to vary in intensity
of impact. For this analysis we combined the suspect and witness ADHD conditions to make a single variable for each component. This was significant, $F(9,93)=4.98$, $p<.001$, $\eta^2=.33$.

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. Detectives rated “Encourage Concentration”, “Mentally Recreate” and “Change Order”, respectively, as the most intensely impacted by ADHD type behaviour. These CI components were significantly different from almost all other components. Similarly, detectives rated the CI components “Establish Rapport”, “Open Non-Leading Questions” and “Compatible Questions” as the least impacted by ADHD-type behaviour.

Table 3

<table>
<thead>
<tr>
<th>CI Components, Rank Ordered</th>
<th>$M$ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage Concentration (EC)</td>
<td>7.71 (1.82)</td>
</tr>
<tr>
<td>Mentally Recreate (MR)</td>
<td>7.58 (1.66)</td>
</tr>
<tr>
<td>Change Order (CO)</td>
<td>7.56 (1.66)</td>
</tr>
<tr>
<td>Report Everything (RE)</td>
<td>7.39 (1.66)</td>
</tr>
<tr>
<td>Change Perspective (CP)</td>
<td>7.38 (1.72)</td>
</tr>
<tr>
<td>Use Imagery (UI)</td>
<td>7.27 (1.67)</td>
</tr>
<tr>
<td>Transfer Control (TC)</td>
<td>7.21 (1.79)</td>
</tr>
<tr>
<td>Establish Rapport (ER)</td>
<td>6.88 (1.85)</td>
</tr>
<tr>
<td>Open/Non-Leading Questions (ONLQ)</td>
<td>6.85 (2.34)</td>
</tr>
<tr>
<td>Compatible Questions (CQ)</td>
<td>6.80 (1.99)</td>
</tr>
</tbody>
</table>
Table 4

*Table 4: t-Scores Comparing the Ten CI Components, Across the Combined ADHD Condition*

<table>
<thead>
<tr>
<th>CI</th>
<th>EC</th>
<th>MR</th>
<th>CO</th>
<th>RE</th>
<th>CP</th>
<th>UI</th>
<th>TC</th>
<th>ER</th>
<th>ONLQ</th>
<th>OQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>-</td>
<td>1.15</td>
<td>1.28</td>
<td>2.60*</td>
<td>2.34*</td>
<td>3.72***</td>
<td>3.58**</td>
<td>5.24***</td>
<td>4.18***</td>
<td>5.63***</td>
</tr>
<tr>
<td>MR</td>
<td>-</td>
<td>0.16</td>
<td>1.64</td>
<td>2.08*</td>
<td>1.64</td>
<td>2.54*</td>
<td>2.48*</td>
<td>4.26***</td>
<td>3.26**</td>
<td>4.55***</td>
</tr>
<tr>
<td>CO</td>
<td>-</td>
<td>1.85</td>
<td>1.91</td>
<td>2.47*</td>
<td>2.78**</td>
<td>4.54***</td>
<td>3.46**</td>
<td>4.88***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE</td>
<td>-</td>
<td>0.04</td>
<td>0.90</td>
<td>1.42</td>
<td>3.80***</td>
<td>2.58*</td>
<td>3.46***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CP</td>
<td>-</td>
<td>0.87</td>
<td>1.11</td>
<td>2.65**</td>
<td>2.40*</td>
<td>3.60***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UI</td>
<td>-</td>
<td>0.43</td>
<td>2.55*</td>
<td>2.10*</td>
<td>3.31***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>-</td>
<td>2.63**</td>
<td>2.24*</td>
<td>3.34***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td>-</td>
<td>0.19</td>
<td>0.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ONLQ</td>
<td>-</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CQ</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05  **p<.01  ***p<.001

Discussion

Overall Findings

Taken together, the overall findings from the analyses show that detectives perceive ADHD type behaviour in suspects and witnesses to exert a highly significant impact on all ten components of the Cognitive Interview. Deeper analyses show that despite all being rated as highly impactful on the interview process, there is a significant difference in the detectives’ perceived severity of impact across the ten components. The ten components are ranked in order of severity of perceived impact. In particular, detectives perceive “Encourage Concentration”, “Mentally Recreate” and “Change Order” respectively, compared with the other seven CI components, as exerting the greatest impact on the interview process. Detectives perceive “Establish Rapport”, “Open Non-Leading Questions” and “Compatible Questions”, compared with the other seven CI components, as exerting the least impact on
the interview process. Thus overall, detectives perceive ADHD type behaviour to exert a highly significant impact on all CI components, but especially “Encourage Concentration”, “Mentally Recreate” and “Change Order”. These findings support the first hypothesis, that ADHD type behaviour would impact all CI components. The second hypothesis, that the most impacted CI components would include “Encourage Concentration”, “Mentally Recreate”, “Change Order” and “Change Perspective”, was partially supported. Whilst “Encourage Concentration”, “Mentally Recreate” and “Change Order” were rated as significantly more impacted compared with other CI components, “Change Perspective” was ranked further down the list of influenced components.

**Explaining the Key Findings**

This study was the first to measure police perceptions regarding the impact of ADHD in youth interviewees, on the different components of the Cognitive Interview. The findings that detectives perceive all CI components to be significantly more impacted in the ADHD condition, compared with the control condition, is in line with literature highlighting that the wide-scale functional deficits associated with ADHD are the most problematic and demanding of police resources in the interviewing process even when controlling for co-morbidity with other disorders (see Dalsgaard, Mortensen, Frydenberg, & Thomsen, 2013; Gudjonsson et al., 2008, 2016; Gudjonsson, Sigurdsson, Adalsteinsson, & Young, 2012; Young et al., 2013). The findings also align with and extend upon recent research (Cunial & Kebbell, 2017) showing that Australian detectives report youth interviewees they encounter in their own work, with ADHD-type behaviour similar to that described in the vignettes, to have a highly significant impact on the interviewing process as measured by time efficiency and quality of information gathered.

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, judgment and decision-making (see Barkley, 2015; Bruchmüller, Margraf, & Schneider, 2012; DosReis, Barksdale, Sherman, Maloney & Charach, 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 was based heavily on mnemonics, and in particular the manipulation of contextual factors at encoding in order to enhance retrieval (see Tulving and Thompson, 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 this impairment contributes heavily to their other executive function deficits, such as attention (Tillman, Eninger Forssman, & Bohlin, 2011), impulsivity (Raiker, Rapport, Kofler, & Sarver, 2012) as well as hyperactivity (Rapport et al., 2009), and that these areas improve if working memory improves (Beck, Hanson, Puffenberger, Benninger, & Benninger, 2010; Van de 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 detectives as exerting a particularly strong impact on the interview process. These CI components are more cognitively demanding and draw particularly heavily on memory encoding and retrieval. This requires the interviewee to hold information in their mind and manipulate it, using working memory. These components also appear to require the interviewee to demonstrate freedom from distractibility/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, and in particular regarding vulnerable groups such as those on the Autistic Spectrum who share similar cognitive deficits to those with ADHD (Clarke & Milne, 2001; Dando, Wilcock & Milne, 2008, 2009; Kebbell, Milne & Wagstaff, 1999; Maras & Bowler, 2010; Maras, Mulcahy, Memon, Picariello, & Bowler, 2014; Tye et al., 2016; Wright & Holliday, 2005). The CI component “Change Perspective” was hypothesized to be particularly salient in the current study, but did not rank as highly as the above mentioned components. This was surprising, given that research has shown youth with ADHD to have impaired perspective taking, and for 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 for 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 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 detectives, whereby “Encourage Concentration” is ranked as exerting the greatest perceived impact on the CI when compared with the other nine CI components. If detectives are unaware that the interviewee may have a diagnosis of ADHD and/or of the attentional difficulties associated with ADHD, or most importantly how to best accommodate this deficit, it is understandable that they would find it extremely difficult to “Encourage Concentration” during the Cognitive Interview.
Limitations

The authors note some potential limitations to the current study. Whilst 102 participants were considered to be sizable considering the niche area from which they 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 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 have commended vignettes for their broad applicability, flexibility, consideration to respondent characteristics, high statistical power and validity, as well as their utility in situations that are highly sensitive, challenging, demand critical thinking, or require specific decisions/actions (Collett & Childs, 2011; Ganong & Coleman, 2006; Kish, 2007; Lee, 1993; Stokes & Schmidt, 2012; Taylor, 2006; Tolsma & Blaauw, 2012; Twemlow, Fonagy, Saco, & Vernberg, 2008; Wallander, 2012).

A final limitation relates to potential complications where comorbidity may exist, particularly with oppositional defiant or conduct disorders. Some researchers have suggested 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 have argued 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, Hinshaw, & Pang, 2010; Beauchaine & McNulty, 2013; Beauchaine et al., 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, Wilton & Sapers, 2016). Most importantly, as previously discussed, ADHD is the 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. The findings taken together suggest that detectives perceive ADHD to exert a highly significant impact on all ten components of the CI, which may potentially contribute to a miscarriage of justice. It may be surmised that the CI in it’s 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 the CI in multiple ways that hold considerable implications for the judicial process, and that 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 very 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 interviewees, such as youth with ADHD, and cognitive impairment more broadly, it is advisable to consider 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 not often taught in training programs, 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 ten components of the CI are perceived to be highly impacted by ADHD suggests a need for a comprehensive training program targeting the entire 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/support in such a training program.

Detective training in Australia and the UK currently occurs via a tiered approach, with Level Three training focused 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, as well as the use of intermediaries (see Darwinkel, Powell & Tidmarsh, 2013; Herringbone & Pope, 2014; O’Mahony, Smith & Milne, 2011). The findings of the current paper provide a rationale for an additional specialized intensive training course under Tier/Level Three, which specifically
addresses the CI with ADHD-affected youth.

Future Research

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

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

Conclusion

The current study revealed that detectives perceived ADHD-type behaviour, compared with behaviour described in the control condition, to exert a highly significant impact on all ten components of the CI. There was also a significant difference in the level of impact detectives rated for each CI component. The CI components “Encourage Concentration”, “Mentally Recreate”, and “Change Order” were rated, respectively, as being the most problematic. Detectives rated the CI components “Establish Rapport”, “Open Non-Leading Questions”, and “Compatible Questions” as significantly easier when compared with other CI components. These findings suggest a need for a specialized comprehensive training program for detectives, regarding how to recognize and accommodate ADHD-affected youth
during the investigative interviewing process.

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Conflict of Interest

No potential conflict of interest was reported by the authors.

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