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The effect of cognitive load on nonverbal behavior in the cognitive interview for suspects

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ABSTRACT

We investigated whether cognitive load results in changes to nonverbal behavior in the context of interrogation, and whether psychopathic traits affected this relationship. Cognitive load was implemented by using the cognitive interview for suspects (CIS). Onehundred- and-fifty undergraduate students were assigned to one of two conditions: 1) a true event, where they played a game with a confederate, and money went missing from a wallet in the room, or 2) a false-alibi condition, where they read a scenario similar to the true event (in order to create a feasible alibi), and were instructed to steal $10 from the wallet. Blinking, hand gestures, trunk movements, and direct eye gaze were coded at each point in the CIS. Regardless of condition, the increase in cognitive load had the effect of increasing blinking and decreasing hand gestures and direct eye gaze. There were significant interactions between CIS stage and experimental condition for blinks and hand gestures, where people in the false alibi condition had a sharper increase in blinking, and decrease in hand gestures when cognitive load was introduced. Psychopathic traits did not affect the utility of above cues, but change in trunk movements was positively correlated with psychopathy in the false alibi condition.

1. Introduction

Police are trained to use nonverbal cues to detect deception (Bull, 1989), but their accuracy hovers around chance, regardless of experience (Vrij, 2000, 2004). In fact, training in traditional interrogation techniques, (i.e. Reid technique) actually result in *decreased* accuracy (Kassin & Fong, 1999). Cues used include gaze-aversion, an increase in hand/ft movements, and an increase in fidgeting, which are thought to increase due to heightened anxiety or nervousness when being deceptive. The most commonly stereotyped cue is gaze-aversion (e.g. Akehurst, Kohnken, Vrij, & Bull, 1996) which actually has little association with deception, according to a comprehensive meta-analysis (DePaulo et al., 2003). In fact, a recent study suggests that deception is characterized by increased deliberate eye-contact (Mann et al., 2012). DePaulo et al.'s meta-analysis did not find any cues that reliably discriminate between lies/truths. It should be noted that most studies that have been conducted have used student samples in a laboratory context, and only three used forensic samples. In one study of actual interrogations, Mann, Vrij, and Bull (2002) found that liars blinked less, but no relationship was observed for gaze-aversion, illustrators, or hand/arm movements. Approximately half of the sample showed gaze-aversion during deception, while the other half showed less gaze-aversion, suggesting that there may be individual differences in how deception is expressed in nonverbal behavior. Another possible reason for mixed findings is that deception causes *changes* in nonverbal behavior that may differ between individuals. Thus, it would be important to examine these cues in relation to baseline behaviors. Previous research does suggest that prior familiarity with an individual increases accuracy of deception detection (e.g. DePaulo, 1994).

We can exaggerate differences between liars and truth tellers by increasing cognitive load (i.e. making deception more cognitively demanding; Vrij et al., 2008). Deception is already more cognitively demanding than truth telling for a number of reasons, as discussed by Vrij et al. For example, the deceiver has to formulate a story and remind themselves of the details of the story (DePaulo et al., 2003) and deception requires a good deal of self-monitoring in order to appear to be honest (DePaulo & Kirkendol, 1989). Further, the deceiver must invest energy into monitoring the interviewer to determine whether the lie is being believed (Buller & Burgoon, 1996). The deceiver also has to attempt to suppress the truth (Spence et al., 2001). Overall, then, deception requires deliberate mental effort that is unnecessary when telling the truth (Gilbert, 1991).

Because deception is cognitively demanding, some researchers have suggested that the nonverbal cues that should be associated with deception are those that are associated with increased cognitive load. Unlike the nonverbal cues associated with anxiety (e.g. increased

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blinking and gesturing; Vrij et al., 2008), cognitive load reduces fidgeting, gesturing, and blinking. This has led a number of researchers to suggest that these could be cues to deception, given its cognitive demands (e.g. Mann et al., 2002; Vrij & Mann, 2003).

Vrij et al. (2008) attempted to enhance the differences between liars and truth tellers, having participants tell stories in reverse chronological order in an attempt to increase cognitive load. Participants were randomly assigned to a reverse order or chronological order condition. As expected, more verbal cues to deceit were observed in the reverse order condition, but, also, nonverbal behavior that is typically associated with anxiety increased, including blinking and hand/foot movements. While gaze-aversion was measured, no results were reported. These findings suggest that not only is telling stories in the reverse order more cognitively demanding, it may also increase anxiety, resulting in an increase in the nonverbal behavior associated with anxiety.

Vrij et al. (2008) suggest that a cognitively demanding interview will be especially problematic for people attempting to be deceptive, as deception is cognitively demanding on its own. One interview that does increase cognitive load is the cognitive interview for suspects (CIS) developed by Geiselman (2012). The CIS increases cognitive load by asking the suspect to recount their story in different orders (e.g. backwards). The cognitive interview is an empirically validated method for interviewing witnesses and victims (reviewed by Geiselman, 2012), elicits more information (and more correct information), and has excellent reliability and validity (Kohnken, Milne, Memon, & Bull, 1999). As mentioned, this interview has recently been adapted for use with suspects (Geiselman, 2012). Not only does the CIS increase cognitive load, but also cues to deception can be examined at different points in the interview, allowing the interviewer to see *changes* in behavior as cognitive load increases. As suggested by Vrij et al. (2008), discrepancies in nonverbal behaviors should occur with the addition of cognitive load.

Because some previous findings suggest that individual differences exist for some nonverbal cues (e.g. gaze aversion in the Mann et al., 2002), we sought to determine whether psychopathic traits, which include a tendency to make use of deception and manipulation (Hare, 2003) might influence the display of nonverbal cues during deception. As well, psychopaths are responsible for a disproportionate amount of crime (Quayle, 2008) and, thus, are overrepresented in the legal system (Hare, 2003). People with psychopathic traits do tend to utilize deception more often than other people (Seto, Khattar, Lalumiére, & Quinsey, 1997), and there is some evidence that they may be better at it than others (Billings, 2004; Book, Starzyk, Holden, Wasylkiw, & Edwards, 2006), although Klaver, Lee, Spidel, and Hart (2009) found that raters were better able to pick up on deception in psychopaths than in non-psychopaths, and Raskin and Hare (1978) did not find any differences in arousal during deception. Though findings are mixed, it is clear that deception detection is an important part of the interrogation process, and may be impacted by individual differences such as psychopathy (Klaver et al., 2009). Fitting with the idea that psychopaths have a dominant interpersonal style is Quayle's (2008) assertion that psychopathic suspects will try to charm and outwit the interrogator, including using distracting and dominant nonverbal behavior, such as using more hand gestures, moving towards the interviewer, and direct eye contact.

While little research has been conducted looking at nonverbal behavior and deception in relation to psychopathy, a number of studies have examined their nonverbal behavior in interpersonal situations and interviews. In the only study to examine the relationship between nonverbal behaviors and deception in individuals with psychopathic traits, Klaver, Lee, and Hart (2007), asked inmates from a federal prison to tell a true story regarding their crime, and a false story about a crime they didn't commit. Regardless of condition, people scoring higher on psychopathy displayed more blinking and illustrators (Klaver et al.). The researchers suggested that the increase in blinking may serve to help psychopaths manage the impression they give to the interviewer, however further research is needed to validate this claim. These findings contradict previous studies investigating blinking behavior in deceitful suspects (Mann et al., 2002; Vrij & Mann, 2001), and shed light of the possibility of interpersonal traits associated with psychopathy moderating nonverbal behaviors in deceptive psychopaths (Klaver et al.). With regard to the increase in illustrator usages, Klaver et al. touched on previous studies showing interpersonal characteristics of psychopathy being associated with an increase in hand gestures (Gillstrom & Hare, 1988; Rimé, Bouvy, Leborgne, & Rouillon, 1978). Research by Gillstrom and Hare (1988), examined hand gestures from videotaped interviews of individuals scoring high, medium and low on the PCL-R. Their results showed psychopaths to employ more hand gestures when compared to non-psychopaths. Specifically, people with psychopathic traits exhibited more beats (hand gestures that are unrelated to speech) compared to those scoring medium or low. It was also theorized that beats might be used to distract the interviewer and gain control over the interview itself (Gillstrom & Hare, 1988). The above findings highlight the need for research to examine factor scores of psychopathy with regards to differences in nonverbal behaviors during deception.

The current study seeks to examine whether changes in nonverbal behaviors over the course of the CIS are consistent with either a) heightened anxiety (resulting in increased gesturing, gaze aversion, and blinking), b) increased cognitive load (resulting in decreases), or c) both. Because other studies have found that individual differences may be important (Mann et al., 2002), we also predicted that psychopathic traits may be related to changes in nonverbal cues when cognitive load is introduced.

2. Methods

2.1. Participants

One-hundred-and-fifty undergraduate students participated (76 women; 74 men (M_{age} = 20.97; SD = 3.42)) and were randomly assigned to the truthful or false-alibi condition. The study was given approval to proceed by the university Research Ethics Board.

2.2. Measures

2.2.1. Psychopathic traits

Psychopathic traits were assessed using the Self-Report Psychopathy Scale: Version III (SRP-III), which has demonstrated strong reliability (α = 0.88) in previous studies (Williams, Nathanson, & Paulhus, 2003). The SRP-III accommodates changes by Hare (2003) pertaining to the expansion of the PCL-R from a two to a four-facet structure examining Antisocial Behavior, Impulsive Thrill-Seeking, Interpersonal Manipulation and Cold Affect (Williams et al., 2003). The SRP-III measures components associated with Factor 1 and Factor 2 of the PCL-R and divides the acquired results into four facets: interpersonal manipulation, callous affect, erratic lifestyle and anti-social behaviors (Williams, Paulhus, & Hare, 2007). Each of these facets has shown to have construct validity with regards to self-reports of anti-social behaviors as well as personality characteristics (Williams et al., 2007), and has shown to be a valid and reliable measure of subclinical psychopathic traits (Williams et al., 2003). The measure consists of 64 items rated on a five-point scale with potential responses ranging from 1 (*disagree strongly*) to 5 (*strongly agree*). Internal consistencies in the present study support the reliability of the measure (alphas range from 0.75 to 0.83 for Interpersonal Manipulation, Callous Affect, Erratic Lifestyle, and Antisocial Behavior).

2.2.2. Nonverbal behaviors

Nonverbal behaviors were coded employing techniques showing acceptable reliability in previous studies (e.g. Granhag & Stromwall,