Effects of context and state of guilt on the detection of concealed crime information

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ABSTRACT

The effects of the state of guilt and the context in which critical information was received on the accuracy of the Concealed Information Test (CIT) were examined in a between-subjects mock crime experiment. 100 participants were randomly assigned to four experimental conditions and one control condition. The experimental conditions were created using a 2×2 factorial design (two conditions of the context in which the crime-related details were collected – crime context or neutral context, crossed with two guilt conditions – accomplices or innocents). Results indicated that accomplices were more effectively detected than innocent participants, although both were given the same critical information. Information gathered in the crime context yielded stronger orientation to the critical items than similar information gathered in a neutral context.

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1. Introduction

Two main approaches to psychophysiological detection of information have been the major focus of research, discussion and debate in the last four decades (e.g., Ben-Shakhar and Furedy, 1990; Lykken, 1998; National Research Council, 2003; Raskin, 1989; Reid and Inbau, 1977). The most widely used method, the Comparison Questions Test (CQT), has been extensively debated in the scientific literature. Questions have been raised as to whether it is based on solid scientific principles, whether it uses proper control questions, and whether it is a standardized test (e.g., Ben-Shakhar, 2002; Ben-Shakhar and Furedy, 1990; Furedy and Heselgrave, 1991; Honts et al., 2002; Iacono and Lykken, 2002; Lykken, 1974, 1978, 1979, 1998; Podlesny and Raskin, 1977, 1978; Raskin, 1982, 1986, 1989; Raskin and Podlesny, 1979; Saxe and Ben-Shakhar, 1999).

A second method, known as the Concealed Information Test (CIT) or the Guilty Knowledge Test (GKT), has drawn considerable attention among researchers, but has been extensively applied only in Japan (Fukumoto, 1980; Nakayama, 2002; Yamamura and Miyata, 1990). There is a general consensus that the CIT does rely on solid scientific principles and incorporates proper control questions (e.g., Ben-Shakhar et al., 2002; Ben-Shakhar and Elaad, 2002; Ben-Shakhar and Furedy, 1990; Lykken, 1974, 1998).

The CIT utilizes a series of multiple-choice questions, each containing one critical (e.g., a feature of the crime under investigation) and several neutral (control) alternatives, chosen so that an innocent suspect would not be able to distinguish between them and the critical item (Lykken, 1998). Typically, if suspect's physiological responses to the critical alternative are consistently greater than to the neutral alternatives, knowledge of the event is inferred.

Detection in the CIT relies on the orienting reflex (OR) theory. The orienting reflex is a complex of behavioral and physiological responses elicited by a novel or personally significant stimulus (Sokolov, 1963). The OR plays a crucial role in information processing. According to Sokolov (1963), a mental model of the surrounding world is gradually constructed over repeated episodes of sensory information processing. Any subsequent incoming sensory information is then compared to that model. If a mismatch between the neuronal model and the incoming stimulus is detected, an OR is elicited, indicating novelty. If the stimulus matches the existing model, the OR is inhibited and habituation (a gradual decrease in response magnitude) takes place. ORs can also be evoked by stimulus significance, but in this case a match, rather than mismatch, between the stimulus input and mental representations of prior significant information will affect OR magnitude (Gati and Ben-Shakhar, 1990).

The OR is the active mechanism underlying the enhanced responses elicited by the critical (e.g., crime related) items in the CIT. Previous research has demonstrated that this method can be an effective aid in criminal investigations (e.g., Ben-Shakhar and Elaad, 2002, 2003). Lykken (1974) argued that the enhanced physiological responses to the undisclosed relevant information are based on the OR. Hence, the critical item has a special meaning and will lead to enhanced physiological responses only for the guilty suspects. For

persons without this particular knowledge, all items should evoke equivalent responses. In this case, the probability of consistent responses to the crime-related details is expected to be at chance level.

Lykken's approach is a simple cognitive approach that emphasizes the individual's knowledge rather than the individual's emotions, the act of deception, or motivation to deceive. Support for the cognitive approach can be obtained from findings that demonstrate how relevant information can be detected under conditions with no involvement of deceptive verbal responses and where no motivational instructions are presented to the subjects (see Ben-Shakhar and Elaad, 2003 for a review). The cognitive approach receives further support from indications of skin conductance response habituation in the CIT (e.g., Elaad and Ben-Shakhar, 1997; Verschuere et al., 2004) and from studies demonstrating OR generalization (another feature of OR) in the CIT (see Ben-Shakhar et al., 1996).

From a practical standpoint, the simple cognitive approach suggests that the CIT operator should guarantee that no relevant information has leaked to innocent suspects. Such information could be leaked through rumors and mass media descriptions of the crime. In addition, suspects could be exposed to some critical information during the interrogation itself. As long as innocent suspects can explain how they became aware of the critical information, they may be able to defend themselves against false positive outcomes. However, innocent suspects who were exposed to relevant information are frequently unaware of this exposure and are unable to account for the sources of their knowledge.

In fact, the predictions of the simple cognitive approach failed to explain the results of mock crime studies where innocent participants were exposed to relevant information in an innocent context. In the first two studies (Giesen and Rollison, 1980; Stern et al., 1981), a mock crime was used in which the same relevant information was presented to guilty participants who actually committed the mock crime and to innocent participants who received the information in a non-crime context. Thus the critical items had a special meaning to all participants. The impact of the overt deception was excluded because participants in these two studies remained silent. Findings indicated that it was still possible to discriminate between guilty and innocent participants. This contradicts the simple cognitive approach because significant differences in detection were obtained between groups who shared the same information.

Subsequent studies in which innocent participants were exposed to relevant information were conducted by Bradley and his colleagues. Bradley and Warfield (1984) staged a mock crime, which was committed by a group of guilty participants. Three groups of innocent participants received relevant information. One group served as witnesses, another group received the details of the crime, and a third group performed innocent activities involving crime-related information (innocent associations group). A fourth group of innocents received no crime-related information. The Guilty Action Test (GAT) format was used in which participants were asked if they actually committed the crime (e.g., "Did you murder the victim in ….?") rather than the usual CIT format in which suspects are asked if they knew about the crime (e.g., "Did the murder take place in …?"). When giving a "No" response to GAT questions, guilty participants reacted to recognition of the critical items and that they were lying about their actions as they related to that information. Innocent participants recognized the information but were not lying about the criminal act they did not commit. Results showed that the correct detection rates of guilty participants were greater than those in any of the innocent groups. Bradley and Rettinger (1992) used three groups: a group of guilty participants who committed a mock crime, a group of innocent participants who received the same information as the guilty group, and a group of innocent participants who were totally unaware of the critical information. Again, GAT questions were presented and guilty participants scored higher on the critical items than participants who were merely aware of the information. Bradley et al. (1996) compared

the standard CIT format with the GAT variation and replicated the results of the former studies under the GAT condition for guilty and informed innocent participants. However, they reported a very high rate of false positives for informed innocent participants who were questioned with the usual CIT format and were instructed to be overtly deceptive to the critical information even though they were innocent.

Ben-Shakhar et al. (1999) further investigated the effect of disclosing critical information to innocent participants on the accuracy of the CIT. They used the GAT format and reported that informed innocent participants showed relatively larger electrodermal responses to the critical items than uninformed innocent participants, but not as large as responses of guilty participants.

The following four major factors that affect CIT detection accuracy can be identified from this series of mock crime studies: (a) participants' knowledge of the critical information, (b) participants' deceptive responses to the critical items, (c) the context in which the information is disclosed or discovered, (d) participants' state of guilt.

The above-mentioned studies manipulated all four factors. For example, knowledge of the critical information was varied. Participants who committed the crime actually handled the critical articles whereas informed innocent participants received descriptions of the items but had no direct experience of them (The exception is the innocent associations group in Bradley and Warfield's (1984) study which was the highest scoring group amongst the innocent participants; 75% of them were classified as guilty). Thus, the information possessed by guilty participants was different from the information that informed innocent participants received, and obviously different from that received by uninformed innocents. In their meta-analysis, Ben-Shakhar and Elaad (2003) demonstrated that handling articles in a mock crime elicits a stronger orientation toward the articles than learning a list of code words and responding to them in the test. Thus, the different type of knowledge may explain why guilty participants, who actually committed the crime, were more effectively detected than informed innocents. Furthermore, using the GAT format, guilty participants were required to lie about their knowledge, whereas innocent participants were asked to tell the truth. Ben-Shakhar and Elaad (2003) showed that lying about critical items is related to stronger physiological responses than telling the truth. Bradley et al. (1996) supported this notion, showing that informed innocent participants were particularly responsive when they had to lie overtly about their knowledge. In all the described studies, guilty and informed innocent participants differed either in the knowledge they possessed or the different questioning format to which they responded. This justifies another look at the detection of informed innocent participants when participants' knowledge of the critical information and the format of the question series are maintained constant. In the present study all groups of participants received exactly the same information, and both guilty and informed innocent participants were required to lie about their knowledge: Guilt and context factors were systematically examined.

The CIT design ensures maximal protection for the innocent in the experimental setups (Ben-Shakhar and Elaad, 2003) and in the field (Elaad, 1990; Elaad et al., 1992). For this reason, the prospects of innocent examinees proving their innocence are better than those of guilty participants. In actual criminal investigations, guilty suspects may perceive this difference and either despair or be motivated to beat the odds and cope with the polygraph (Reid and Inbau, 1977). Guilty participants who are engaged in mock crimes are in a different state than guilty suspects. They know perfectly well that they are participating in a game and that despite of the low odds of beating the polygraph, they are free to go after the test. Thus, the mere performance of mock crimes does not evoke the emotions, concerns, or sense of guilt of suspects in actual criminal interrogations. Bradley et al. (1996) clearly showed that if the state of guilt is defined by mere involvement in a mock crime, the detection rate of informed innocent participants is not different from that of guilty participants.