



Contributions of personality dimensions to spontaneous and deliberate information processing in the guilty actions test



Liza Zvi *, Eitan Elaad

Ariel University, Israel

ARTICLE INFO

Article history:

Received 1 June 2016

Received in revised form 1 October 2016

Accepted 3 October 2016

Available online 5 October 2016

Keywords:

Concealed Information Test

Big-Five

Locus of control

Skin conductance

Detection of deception

ABSTRACT

The contribution of the Big-Five personality dimensions and locus of control to examinees' physiological responses in the Concealed Information polygraph Test (CIT) was examined for the first time. One hundred and twenty undergraduate students who completed Big Five personality and locus of control questionnaires were instructed to commit a mock theft. They were subsequently tested in the Guilty Actions polygraph Test, a modified version of the CIT. Each of the six sets of items (questions) was repeated twice. Results showed that introversion predicted enhanced Skin Conductance Responses (SCRs) to the critical items only for the first repetition of the first 3 questions which was explained by sensitivity to orienting responses. In contrast, extraversion was linked to Finger Pulse Waveform Length (FPWL) responses to the first repetition of the first 3 questions and was explained by extended and more deliberate information processing due to increased interest in the experiment. Participants high in openness to experience, characterized by intellectual curiosity, responded more strongly on FPWL throughout the test. Lower Neuroticism scores predicted enhanced Respiration Line Length (RLL) responses in the first repetition of the first 3 questions. Internal locus of control predicted higher tonic skin conductance level before and throughout the test. Results were explained by different information processing styles associated with these personality dimensions during various stages of the test.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

The Concealed Information Test (CIT) consists of a series of multiple-choice questions, each containing one critical item (e.g., an item of information related to the crime under investigation) and several neutral (control) alternative items, which cannot be distinguished by innocent suspects who have no crime-related knowledge (Lykken, 1998). Typically, if a suspect's physiological responses to the critical items are consistently greater than to the controls, it is possible to infer the suspect's knowledge about the crime in question.

The CIT is largely based on orienting response (OR) theory (Sokolov, 1963; Lykken, 1974). The orienting response is a term for several behavioral and physiological responses triggered by a novel, unexpected, unpredictable, or personally significant stimulus (Gati and Ben-Shakhar, 1990; Sokolov, 1963, 1969). After the release of the OR, the stimulus loses its novelty and the response gradually dissipates as a result of habituation. Lykken (1974) realized that the CIT could be used to identify critical crime-related knowledge based on the significance of critical items to "knowledgeable suspects." Following Lykken, the CIT was considered primarily on the basis of cognitive-based OR theory.

The OR theory has been challenged by research results indicating that heart rate deceleration elicited by CIT critical items is more

extended than one would expect according to OR theory (Verschuere et al., 2011). Verschuere et al. (2007b) suggested an alternative explanation based on response inhibition. They proposed that the efforts devoted to suppressing the arousal that accompanies the OR paradoxically increase response magnitude indicated by larger skin conductance response (SCR) amplitude and attenuated respiration and cardiovascular activity.

A recent study (Klein Selle et al., 2016) tested the arousal inhibition theory and reported a similar increase in SCR to the critical items when participants were either motivated to conceal relevant crime items (suspects) or when they were motivated to help the examiners identify them (innocent witnesses). Heart rate (HR) deceleration and respiratory suppression measured by shorter line lengths (RLL) were found in suspects, but not in witnesses. It was suggested that different mechanisms underlie different psychophysiological measures in the CIT. Arousal inhibition was suggested as the mechanism that underlies HR and RLL responses. The notion that the different measures in CITs are driven by different mechanisms was previously suggested by Ambach and his colleagues (Ambach et al., 2008). Based on their methodology of separating the effects of deception from those of orienting, they reported that respiratory and cardiovascular measures were determined by deception-related processes rather than by orienting.

Since HR deceleration is traditionally used as a measure of focused attention (e.g., Kythaparampil, 2011; Salvia et al., 2013; Thomas et al., 2012), attention processes seem to be better candidates for explaining

* Corresponding author.

E-mail address: lisaz@ariel.ac.il (L. Zvi).

the obtained responses than arousal inhibition, which is more difficult to implement. Specifically, it is suggested that two major information processing styles can be identified in the CIT: an immediate and short-lasting OR that is responsible for stimulus identification and classification, and an extended information processing style that reflects respondents' concerns and demands longer attentional investment. Features of SCR amplitude prominently represent the immediate OR, whereas features found in respiration and cardiovascular suppression represent mainly an extended processing style that demands prolonged attention.

It may be further argued that the dynamic in the CIT reflects these two main information processing styles. The immediate OR is apparent in the beginning of the test whereas the deliberate processing style is more prominent later on. Specifically, in a common CIT with six questions and two repetitions of items within each question, the immediate OR is expected to appear in the first repetition of the critical item and subsequently decrease with habituation. It is predicted that in response to the initial presentations of the critical items, SCRs will show dominance over the other two measures. When the items are repeated, the examinee is better prepared. Here, deliberate processing is more frequently applied which may affect SCR dominance.

Exploring individual differences in the use of the two processing styles, Yoshino et al. (2005) demonstrated that skin conductance responses to emotional stimuli vary as a function of individual differences in novelty seeking and harm avoidance. Other studies showed that negative affective styles are associated with increased amygdala activation. Results are based on a comparison between individuals who suffer from depression and healthy controls (Siegle et al., 2002; Siegle et al., 2007; Victor et al., 2010). Canli et al. (2002) and Canli et al. (2001) reported an association between personality characteristics and activity in the amygdala during emotion processing. They found different patterns of amygdala activation among extroverts and neurotic individuals in response to positive and negative pictures. Drevets (2001) and Mayberg (2003) suggested that the amygdala may be differentially responsive to the environment depending on one's affective style. To conclude, there are studies indicating an association between people's information processing styles and

their physiological responses. It is therefore hypothesized that CIT examinees may also differ in their physiological responses to critical CIT items and in their use of different processing styles throughout the test. The effect of individual differences on physiological detection in the CIT is understudied. Past research has focused mainly on individual features related to antisocial behavior such as socialization (e.g. Waid et al., 1979), and psychopathy (e.g. Verschuere et al., 2007a). Other studies examined the effect of extraversion on physiological detection, with inconsistent results (Bradley and Jannise, 1981; Gudjonsson, 1982; Steller et al., 1987; Watson and Sinha, 1993).

1.1. The Big-Five personality dimensions

The goal of the current study was to assess whether physiological responding in the CIT, which is related to automatic orienting and to deliberative information processing, is also influenced by personality dimensions. For this purpose, we used the Big Five personality inventory (BFI), one of the dominant models of personality trait structure (John and Srivastava, 1999; McCrae and Costa, 1997) and a commonly accepted taxonomy for classifying personality. This structure has generalized across cultures, sources of ratings, and measures (e.g., John and Srivastava, 1999; Schmitt et al., 2008). According to this model, the full range of personality traits are captured by five orthogonal dimensions: Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. These traits may be good candidates for predicting who will respond more to critical items with what processing style.

Extraversion covers traits such as energy, positive emotions, assertiveness, sociability, the tendency to seek stimulation with others (prone to sensation-seeking), and talkativeness (McCrae and Costa,

1997). Previous attempts to examine the effect of extraversion on physiological detection of deception reported that extroverted participants were more easily detected than introverts (Bradley and Jannise, 1981; Steller et al., 1987). However, other studies reported that introverts were better detected than extroverts (Gudjonsson, 1982; Watson and Sinha, 1993).

The conflicting findings encourages further examination. It is of particular interest to examine cardiovascular and respiration responses in addition to SCRs and the association between habituation of the responses during the CIT and personality features. Based on the assumption that introverts are more easily aroused than extroverts (Eysenck, 1967), it may be expected that introverts will show more excitement during the test and their responses to critical items will be stronger in the first presentations of questions and items (specifically, at the beginning of the test and in the first of the two repetitions of the critical item). These responses reflect ORs and will be manifested by enhanced SCRs. After becoming accustomed to the test introverts' stronger SCRs to critical items are expected to habituate. It is also hypothesized that in the beginning of the test extroverts will be more interested in it than introverts. Such interest is reflected by deliberate information processing and stronger FPWL responses. However, as the test continues extroverts will lose interest and will respond less to critical items.

Openness to experience reflects intellectual curiosity, independent thinking, creativity and a preference for novelty and variety. It is also described as the extent to which a person is imaginative or independent, and reflects a personal preference for a variety of activities over a strict routine (Barrick and Mount, 1991). People high in Openness are motivated to engage in intellectual pursuits (Moutafi et al., 2006), and are positively associated with high emotional intelligence (McIntyre, 2010). We hypothesized that high Open to Experience individuals, disposed to novelty and intellectual pursuits, will be more interested in the CIT experiment than less curious participants with lower Openness to Experience scores. Therefore, higher Open to Experience scorers will be more attentive to the various CIT items and will manifest stronger responses to the critical items.

Conscientiousness combines features such as the tendency to show self-discipline, act dutifully, and aim for achievement. Conscientious people tend to plan rather than be spontaneous, and are organized and dependable. Conscientiousness and related features such as responsibility and prudence showed a negative association with actual cheating and pro-cheating attitudes (e.g., Day et al., 2011), and a positive association with honesty (Horn et al., 2004) and authentic behavior (Gillath et al., 2010). It may be suggested that Conscientiousness may be related to investment of greater mental effort in the CIT and therefore to more differentiated responses to critical and neutral items, specifically, when deliberate information processing that follows the OR, is applied.

Agreeableness corresponds to trust in others. Agreeable people consider themselves to be nice, friendly and trustworthy. No clear hypothesis was formulated with respect to agreeable individuals' expected responses to critical items in the CIT. Therefore, we will treat such results as exploratory.

Neuroticism is characterized by easily experiencing low self-confidence, pessimism, negative emotions such as anger, depression and vulnerability, sadness, anxiety and irritability and by a limited ability to cope with stress. Neuroticism also refers to low emotional stability and impulse control. Currently we have no predictions as to the expected performance of participants who score high in Neuroticism, in the CIT. Therefore, results will be considered with caution.

1.2. Locus of control

Locus of Control (LOC) is another personality trait that may be involved in shaping differences in responses of individuals attempting to avoid detection in the CIT. LOC denotes an individual's subjective sense of control over various aspects of life. Stronger (or internal) locus of control predicts increased readiness and motivation to cope

Download English Version:

<https://daneshyari.com/en/article/5042379>

Download Persian Version:

<https://daneshyari.com/article/5042379>

[Daneshyari.com](https://daneshyari.com)