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Andrew David Manson
Eastern Kentucky University

Suzanna Lagerroos
Eastern Kentucky University

Phillip Janz
Eastern Kentucky University

Adam Lawson
Eastern Kentucky University

Jonathan Gore
Eastern Kentucky University

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We sought to determine whether sensation seeking would differentially predict measures of memory and deception (concealing information) as indexed by behavioral (response time, accuracy) and autonomic (skin conductance level) markers in a sample of college students. Participants were randomly assigned to a mock-crime group or an innocent-errand group. Both groups were trained to complete a task requiring the copying of documents from a secure location; the difference was the mock-crime group broke into the office whereas the errand group was given permission to enter the room and access the documents. After being trained to perform the crime or errand task, participants watched a video that showed a first-person account of the crime/errand. Participants in the mock-crime group were told to conceal their knowledge of the task during an examination on the next day but to be truthful otherwise. Participants in the errand group were truthful to all items during the examination. The examination involved a recognition task that included words that were (a) scenario-related, (b) personally familiar words gathered from participants' responses to questions about their lives, and (c) irrelevant words not related to the scenario nor their personal lives. Response accuracy differed for the mock-crime and errand groups, but not as a function of sensation seeking. Skin conductance responses revealed that high and low sensation seeking impacted the mock-crime and errand groups differently to personally familiar and irrelevant words, but not to scenario-related words. Findings show that determining whether individuals are high or low sensation seekers prior to assessing deception may be useful for establishing criteria for detecting deception. These results also demonstrate the need to consider personality traits in both detecting deception and understanding the biological correlates of deception.

The present study sought to determine whether sensation seeking would differentially predict measures of deception (concealing information) as indexed by behavioral (response time, accuracy) and autonomic (skin conductance level) markers in a sample of college students. Deception is an inherent element of human interaction, as

Author info: Correspondence should be sent to: Dr. Adam L. Lawson, 127 Cammack Bldg., Richmond, KY 40475 adam.lawson@eku.edu

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written accounts of detecting deception have existed for nearly 3,000 years (Horvath, 1973). Research has acknowledged deception in various contexts, which includes knowingly deceiving others, deceiving others while engaging in self-deception, and self-deception without the presence of others (Damm, 2011; Gaspar & Schweitzer, 2013; Lewis & Saarni, 1993). The advent of social media has spurred deception-related research in online communications (Caspi & Gorsky, 2006; Damm, 2011). Furthermore, research has shown that certain situations are associated with a higher frequency of deception; including trivial encounters with friends and family, and more serious situations including negotiation contexts and legal situations (Gaspar & Schweitzer, 2013; Hartwig & Bond, Jr., 2014; Moran & Schweitzer, 2008).

Particular motivations to deceive that research has identified include avoiding conflict, experiencing envy due to unfavorable social comparisons, avoiding punishment, privacy concerns, elevating status, and protecting the feelings of others (Caspi & Gorsky, 2006; Lewis & Saarni, 1993; Moran & Schweitzer, 2008; Seiter & Bruschke, 2007). The emotional benefits of deception often act as a motivational force to deceive. Individuals engage in acts of deception by manipulating both verbal and nonverbal aspects of communication (e.g., speech content, voice tone, body language). Because of this, research has identified emotion, and the physiological reactions associated with emotion as an underlying theme in acts of deception (Gaspar & Schweitzer, 2013; Hartwig & Bond, 2014; Horan & Dillow, 2009; Lewis & Saarni, 1993; Manstead, Wagner, & McDonald, 1984; Moran & Schweitzer, 2008; Seiter & Bruschke, 2007).

Autonomic nervous system markers have been used to measure stress, heightened emotional processing, and arousal in general due to the act of deceiving (for reviews, see Ben-Shakhar 2012, and Verschuere, Ben-Shakhar, and Meijer, 2011; Visu-Petra, Bus, & Miclea, 2011). Behavioral markers, such as response time or accuracy, also index heightened emotional processes and cognitive load that accompany the act of deception (for reviews see Hartwig & Bond, 2014, Rosenfeld, 2009, and Verschuere et al., 2011; Walczyk, Igou, Dixon, & Tcholakian, 2013). Although these markers are not unique to deceptive processing, they are quite sensitive to many of the psychological processes that characterize intentional deception (Bashore & Rapp, 1993). Furthermore, while previously mentioned research has identified various motivational, situational, and environmental factors that lead to deceptive acts, one area of research that has yet to be systematically explored outside of clinical populations is whether individuals who are skilled in deceiving others share common traits.

Sensation Seeking, Deception, and Memory

Sensation seeking is a biologically based personality trait that reflects the need for varied, novel, and complex sensations and experiences (for reviews, see Roberti, 2004; Zuckerman, 1994, 2013). Sensation seeking is composed of four subtraits including a) thrill/adventure seeking, that reflects the desire for physical experiences; b) experience seeking, which entails the desire for novel mental stimulation; c) disinhibition, which is reflective of a desire for novel social experiences; and d) boredom susceptibility, where the person has a dislike for repeated experiences. Sensation seeking measures are able to index individuals who are more likely to engage in high-risk behaviors including gambling, illegal or illicit drug use, risky sexual activity, and aggressive behaviors (Bardo, Donohew, & Harrington, 1996). Additionally, Norbury and Husain's (2015) review proposed that high sensation seekers may be more vulnerable to develop substance and gambling addictions. Because these psychopathologies are more likely to become manifest in negotiation contexts (e.g., negotiating with drug dealers and/or loan sharks), it could be argued that high sensation seekers are more likely to engage in deception than low sensation seekers. This position has been partially supported in research with clinical populations such as those diagnosed with antisocial personality disorder who are known to be heavily comprised of high sensation seekers (Verschuere, Crombez, De Clercq, & Koster, 2005; Verschuere, Crombez, Koster, & Uzieblo, 2006). Furthermore, Warren and South (2006) found that women offenders who met criteria for antisocial personality disorder demonstrated higher degrees of deceitfulness relative to women who did not meet criteria for either disorder.

A dearth of research has examined the link between sensation seeking and deception. Using a survey to examine links between sensation seeking, deception and Internet dependency, Lu (2008) found that high sensation-seekers were significantly more likely to deceive others in online interpersonal interactions than low sensation seekers. These differences in high and low sensation seekers were thought to be due to characteristics of online communication, specifically anonymity and lack of both verbal cues and social restraint. Lu points out that because online interpersonal communications adhere to a lower level of both normal constraints and social norms, high sensation seekers perceive online interpersonal communications as technological adventures. This motivates high sensation seekers to deceive others to gratify psychological needs, specifically, novelty, arousal, stimulation, conventionalism, and enjoyment.

Investigators have begun to study underlying processes involved in the concealment of information. For example, markers of concealed

information often rely on detecting familiarity and memory processes related to prior encounters with objects, people, and places (Meijer, Selle, Elber, & Ben-Shakhar, 2014; Verschuere & Meijer, 2014). This is noteworthy because detecting concealed information can be accomplished by determining whether an individual remembers details from a crime, regardless of any verbal claims. Furthermore, several recent studies have shown that high and low sensation seekers differ in their memory of information, especially with familiarity memory processes (Lawson et al., 2012; Renfro, Antoine, & Lawson, 2013; Toffalini, Bellavitis, & Cornoldi, 2015).

Research has also linked sensation seeking to working memory and executive functions (e.g., controlling impulses, considering consequences), providing further support that high and low sensation seekers could differ in the act of concealing information (Khurana et al., 2012; Romer et al., 2011). Additionally, Smith, Davidson, Smith, Goldstein, and Perlstein (1989) found increased recall performance in high sensation seekers relative to low sensation seekers. Given that the ramifications of deception can be substantial in certain situations (e.g., organizational negotiations and legal settings), examining whether high and low sensation seekers differ in the act of deception could have strong practical implications.

The current study used behavioral and skin conductance measures to examine the influence of sensation seeking on concealing information and being truthful. Participants were randomly assigned to either an experimental condition (mock-burglary group) or contrast condition (mock-errand group). Participants watched a video portraying them as performing a mock burglary or an errand, and then later completed a familiarity task with an examiner that included words related and not related to the scenario. Participants in the mock-burglary group were instructed to respond deceptively to scenario-related words (i.e., lie about the burglary), but to respond honestly otherwise. Participants in the mock-errand group were instructed to respond honestly for all word types. We operationally defined concealed information as providing a "not familiar" response to crime-relevant (familiar) information. We hypothesized that both behavioral and SCR memory differences reflected by familiar (relevant, personally familiar) versus unfamiliar (irrelevant) responses would emerge between low and high sensation seekers. We also hypothesized that group differences in deceptive (i.e., scenario-relevant words) versus non-deceptive processing (i.e., personally familiar & irrelevant words) would emerge for SCR measures, and these SCR differences would also differ for high and low sensation seekers.

METHOD

Participants

Data were collected from 60 (20 males, 40 females) undergraduate students at a midsized university in the southeast United States. Inclusion criteria consisted of a) between 18 and 65 years of age; b) normal or corrected-to-normal vision (e.g., use of glasses or contacts to correct poor vision); c) no history of neurological disorders or head trauma; d) no history of a personality disorder; e) no history of a learning or reading disability; f) no diagnosis of heart problems; g) no current pregnancy, and h) no use of drugs, prescribed or otherwise that could interfere with the measures of physiological activation. These inclusion criteria insured that participants could perform the experiment and that neither mental illness nor bodily changes during pregnancy would affect the psycho-physiological recordings. All participants provided informed consent and were awarded course credit for their participation. Participants were randomly assigned into either a mock-crime group involving a mock burglary (n = 41, low sensation seeker n = 21, high sensation seeker n = 20) or an innocent group involving an errand scenario (n = 19, low sensation seeker n = 11, high sensation seeker n = 8).

Materials

Brief Sensation Seeking Scale (BSSS). All participants completed the 8-item *Brief Sensation Seeking Scale*, which has shown a coefficient alpha of .78 and good construct validity (BSSS, Hoyle et al., 2002). The BSSS asked participants whether they agree or disagree on a 5-point Likert scale (strongly disagree to strongly agree) with questions such as whether they would like to try thrilling activities such as bungee jumping and exploring strange places, their enjoyment of new and exciting experiences (even if they are illegal), and having friends who are excitingly unpredictable. Total scores were calculated from the individual questions for statistical analyses. The total BSSS scores were then transformed from continuous data into a two level grouping variable using a median split to classify participants as high or low sensation seekers (for similar analysis approach see Lawson et al., 2012; Lu, 2008; Kruschwitz, Simmons, Flagan, & Paulus, 2012).

Scenario tasks & video. A mock-crime or errand information sheet was provided for each participant to read and memorize (see Appendix A). The two information sheets gave the same task, but the rationale for the tasks differed to justify the necessity for participants to deceive or be truthful during a later examination.

All participants viewed the same prerecorded video showing a 1st person account of the scenarios. Only the hands and arms of the actor were shown in the video, and all participants were instructed to imagine

themselves performing the actions shown in the video. The video consisted of entering an office space using a key, looking around and finding a particular office, unlocking this office with a key, entering the office and moving to a file cabinet. In the second drawer of the file cabinet was a folder that contained missile diagrams and schematics. The video showed the person opening the second drawer, removing documents from a file, returning the file back to the drawer, and shutting the file cabinet. The person in the video then exited and locked the office, and then left the office space and relocked the entrance. The video included many objects and details (e.g., yellow vase, black key, fallout project missile schematic) that provided specific memories that were assessed in the subsequent examination. The video lasted approximately 5 minutes.

Familiarity examination task. A computerized familiarity examination task was used to index memory and deception processes during an examination. The task program included the recording of behavioral data and was carried out using the E-prime software package (Psychology Software Tools, Inc.). The task required participants to respond by pressing one of two keys on a keyboard using their dominant hand. The task asked participants to make personally familiar and unfamiliar judgments to a list of words presented one at a time. Words presented included 20 words related to the task scenarios (e.g., black key, fallout project), 20 words related to the participants' personal life, and 20 irrelevant (i.e., foil) words (e.g., red key, green diagram) that were not related to the scenario nor to participants personally, and which were presented in a counterbalanced fashion. Personally familiar information was collected via 20 questions including "What street do you live on?" and "What is your favorite type of music?" It should be noted that the scenario-related and irrelevant word lists were normed for letter length, syllable length, and general complexity. Although the personally familiar word list was unique for each participant, the length and type of answers allowed was monitored to keep this word list as similar as possible in word structure to the other two word lists.

Each word trial in the familiarity examination task was presented for 4 seconds. The inter-trial interval was at least 5 seconds, and was determined by the researcher who visually tracked the participant's skin conductance level. A new trial was started once the skin conductance response (SCR) was at baseline for 1 second. The familiarity examination task took approximately 15 minutes to complete.

Scenario effectiveness questions. After being debriefed at the study's completion, participants were asked three questions regarding the video's effectiveness in portraying their enactment of their scenario. Two questions included "Did you get immersed in the scenario?" and "Did

you feel like you actually did the scenario task?" with response options of definitely, somewhat, a little, or not at all. The third question asked "Do you believe that physiological recordings can detect whether a person is concealing information or not?," with a yes or no response option.

Procedure

On Day one, participants initially provided informed consent and then completed the BSSS. Participants were then trained to enact a mock-burglary scenario or an errand task. Training steps included having participants initially read the scenario instructions, and then repeat the instructions from memory with prompting by the researcher and review as needed. After participants recalled each part of the task from memory, they then watched a video that portrayed the enactment of the task. The same video was used for both groups, showing a first-person account of going into an office, taking documents, and then leaving. After watching the video, participants in the mock-crime group were directed to conceal their knowledge of the scenario from an examiner during a second day of testing, and to only provide personal information when directly requested to do so. Participants in the comparison group were directed to be truthful towards the examiner during a second day of testing, but to only provide information when directly requested to do so. Day one lasted approximately 60 minutes.

On Day two, participants met with the examiner, and were hooked up to the physiological instruments. An optic blood pressure monitor and two electrodes that measure skin conductance (i.e., sweat secretion) were placed on the index and middle fingers of the participants' non-dominant hand. Placement of the physiological instruments took approximately 5 minutes.

The participant then performed the computerized familiarity examination task, requiring approximately 10 minutes. Following the task, participants were debriefed, and were provided a paper asking them three questions that assessed the effectiveness of the scenario.

Apparatus for Psychophysiological Data

Skin conductance responses were recorded, digitized, and analyzed using the Biopac software (Biopac Systems, Inc.). The stimulus computer was linked to the physiological recording system for the purpose of triggering the digitizer to reference stimulus onset. Two Ag/AgCl cup electrodes were attached to two adjacent fingers of a participant's non-dominant hand in conjunction with an isotonic electrode gel (0.5 % saline in a neutral base). Any trials that contained excessive pre-stimulus electrodermal artifact via visual inspection were excluded from SCR

analyses (~ 10 % of trials). Skin conductance responses for each trial (i.e., for each image presentation) were determined by subtracting the phasic skin electrodermal activity (maximum activation 0 – 4000 ms post-stimulus) from tonic skin electrodermal activity (-500 – 0 ms average pre-stimulus onset). Any trials that had incorrect familiarity judgments were excluded from response time and SCR analyses (for a similar analysis approach see Renfro et al., 2013).

RESULTS

In order to examine the interplay between the three independent variables, data were analyzed using a mixed analysis of variance (ANOVA) with Sensation Seeking (low, high) and Scenario Group (mock-crime, innocent) serving as between-group variables and Word Type (scenario, irrelevant, personally familiar) serving as the within-group variable. This analysis approach was used for each dependent variable (i.e., response accuracy, response time, SCR).

Data averages and significant findings for Scenario and Sensation Seeking Groups are shown in Tables 1 and Table 2, respectively. The majority of participants reported that they were both immersed in the scenario (definitely = 37 %, somewhat = 38 %) and felt like they actually did the scenario task (definitely = 27 %, somewhat = 40 %). The vast majority of participants (80 %) also believed that physiological recordings can detect concealing information.

TABLE 1 Means and Standard Deviations of Dependent Variables

	Mock-crime Group			
Innocent Group				
	LSS	HSS	LSS	HSS
Sample Size	(n = 21)	(n = 20)	(n = 11)	(n = 8)
BSSS	21.76 (4.15)	30.40 (3.00)	19.91 (5.09)	29.25 (1.28)
Immersion Q1	2.16 (0.96)	2.33 (0.49)	2.18 (0.98)	2.25 (0.71)
Immersion Q2	1.84 (1.17)	1.87 (0.92)	1.91 (0.94)	2.25 (0.71)
Immersion Q3	84 % (38 %)	100 % (0 %)	82 % (41 %)	100 % (0 %)
RT	1260.81 ms (251.97)	1256.52 ms (270.86)	1158.19 ms (205.63)	1281.28 ms (278.21)
RA	94.45 % (5.62 %)	93.08 % (6.48 %)	88.33 % (8.11 %)	89.17 % (7.36 %)
SCR	.0350	.231	.302	.240

Note: LSS = Low Sensation Seeking; HSS = High Sensation Seeking; RT = Response Time; RA = Response Accuracy; SCR = Skin Conductance Response (Raw Scores).

For response accuracy, a main effect of Scenario Group, $F(1,56) = 21.18$, $p < .0005$, $\eta^2 = .27$, showed that the mock-crime group ($M = 93.8$ %) was more accurate than the innocent group ($M = 88.8$ %). An interaction of Scenario Group by Word Type, $F(2,112) = 12.64$, $p < .0005$, $\eta^2 = .18$, was also found. Contrasts revealed that for scenario relevant ($p = .01$) words, mock-crime participants were more accurate (M = 97.5 %) than innocent participants ($M = 85.9$ %). A similar effect was also found for irrelevant words ($p = .03$), with mock-crime participants

TABLE 2 Mixed ANOVA Significant Main and Interaction Effects

Measure	*df*	*F*	η^2	*p*
SCR	2	16.81	.23	<.0005
SCR	2	4.12	.07	.019
Response Time	2	47.55	.46	<.0005
Response Accuracy	2	12.64	.18	<.0005

Note: First SCR is for Word Type, second SCR is for Sensation Seeking x Scenario Group x Word Type, Response Time is for Word Type, and Response Accuracy is for Scenario Group x Word Type

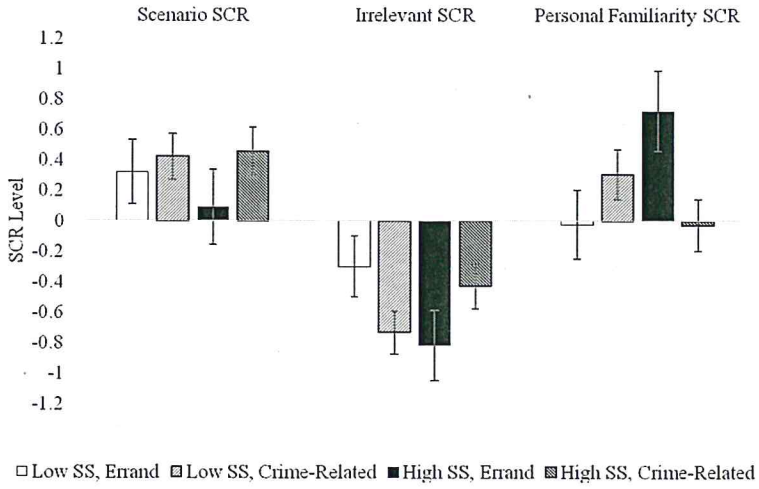

FIGURE 1 Standardized Levels (i.e., z-scores) of Skin Conductance by Personality, Scenario Group and Word Stimulus

being more accurate (M = 94.8 %) than innocent participants (M = 89.4 %). No group difference was found for personally familiar words (mock-crime M = 89.0, innocent M = 90.8). For response time, a main effect of Word Type, $F(2,112) = 47.55$, $p < .0005$, $\eta^2 = .46$, was found. All participants responded faster to scenario (M = 1200 ms) and personally familiar (M = 1166 ms) words than irrelevant words (M = 1427 ms). No behavioral results involving sensation seeking were found.

For skin conductance response (SCR), a main effect of Word Type was found, $F(2, 112) = 16.81$, $p < .0005$, $\eta^2 = .23$. Post hoc analysis revealed that SCR levels for scenario and personally familiar words (p = .01 for both contrasts) were higher than SCR levels for irrelevant words. A Sensation Seeking x Group x Word Type interaction effect was also found, $F(2, 112) = 4.12$, $p = .019$, $\eta^2 = .07$. As Figure 1 shows, simple effects contrasts revealed a significant interaction between Sensation Seeking and Group for personally familiar (p = .01) and irrelevant (p = .03) words, but not for scenario relevant words (p = .50).

DISCUSSION

The current study examined the potential relationships between sensation seeking, memory and deceptive processes using behavioral and skin conductance response (SCR) measures. As hypothesized, differences between the mock-crime and innocent groups varied between high and low sensation seekers, and these effects were related to whether word items in the memory task had been encoded into memory or not. Our second hypothesis that sensation seeking differences would emerge for deceptive processes was not supported, however, since no sensation seeking differences were found with scenario related words.

The SCR interaction between sensation seeking, scenario groups, and word type revealed sensation seeking differences for the personally familiar and irrelevant word types, but not for the scenario related items (Figure 1). The mock-crime group only concealed their knowledge of scenario words and was honest otherwise. The innocent-errand group was honest to all word-types. So the lack of sensation seeking differences found for these scenario relevant words does not support a direct link between sensation seeking and deception. Thus, we cannot conclude that the specific act of concealing information is different for high and low sensation seekers.

Concealing information during the task, however, had a widespread impact on task performance. Our results show that responding truthfully to personally familiar words and irrelevant words does differentiate high and low sensation seekers. As Figure 1 shows, deception processes were related to arousal for low sensation seekers who revealed irrelevant information, and high sensation seekers who revealed personally familiar

information. Additionally, because the order of word list presentation was counterbalanced, our findings suggest that participants' intention of utilizing deception processes also influenced memory processes, and that this relationship was moderated by sensation seeking.

Non-significant differences in SCR levels for concealing mock-crime scenario information could be due to the general nature of SCR being activated by any type of arousal or stress, or the difficulty of producing high ecological validity in mock-crime scenario experiments (Whelan, Wagstaff, & Wheatcroft, 2014). Our use of a first-person video to portray the enactment of a scenario allowed for feasibility and a high level of control as to what participants experienced, but this video enactment clearly did not have the same immersive nature as would be expected from actually carrying out the scenario. Additionally, completing a scenario for an experiment is not the same as an actual criminal investigation that utilizes polygraph testing. It is also important to note that deceptive participants were instructed by a trainer to respond to scenario-related items in a deceptive manner, and thus this behavior could simply reflect following a prescribed responding rule as opposed to being deceptive. Still, the majority of participants (75 %) reported being at least partially immersed in the video, and thus the scenarios can be considered engaging and first-person/autobiographical in nature.

While our behavioral results were not affected by sensation seeking, differences in relation to deception emerged. Participants in the mock-crime scenario responded more accurately than those in the innocent-errand scenario for scenario and irrelevant words. Prior research has shown that individuals who deceive take greater care and utilize more intentional effort that reflects slower responding than innocent participants (Kruschwitz et al., 2012), and our results are consistent with this interpretation. Also, many studies have found a response time delay when responding deceptively that reflects the increased cognitive load required when lying (Walczyk, Mahoney, Doverpike, & Griffith-Ross, 2009), but we did not find any deceptive-innocent difference in response times. Rather, our findings are consistent with prior memory studies showing faster response times to items held in memory as opposed to new items that evoke a more exhaustive search (Chainay, Michael, Vert-pré, Landré, & Plasson, 2012). Thus, the speed differences attributable to memory may have overshadowed any deceptive difference. It is important to note that this memory effect could potentially be used to identify deceptive responses by comparing differences in response times for mock-crime information.

Overall, we found similar patterns in arousal levels for irrelevant and personally familiar words between low sensation seekers in the errand condition and high sensation seekers in the mock-crime condition. This

pattern was also consistent for low sensation seekers in the mock-crime condition and high sensation seekers in the errand condition. These patterns in arousal levels are consistent with previous research, as Renfro et al. (2013) found sensation seeking to predict differences in arousal levels for participants exposed to both familiar and unfamiliar images of both low and high arousal. Renfro et al. found that low sensation seekers exhibited higher arousal levels relative to high sensation seekers to personally familiar words, and high sensation seekers exhibited higher arousal levels relative to low sensation seekers for irrelevant words. This is the same memory pattern found in our current study, with high sensation seekers showing diminished SCR activation to personally familiar items and heightened activation for irrelevant items.

It is also important to note that the current experiment assessed autonomic markers of arousal by having participants engage in verbal recognition tasks that used words of low semantic arousal, whereas Renfro et al.'s (2013) experiment assessed autonomic SCR markers of arousal by having participants engage in visual recognition tasks that used pictures of both low and high arousal, with both experiments displaying matching results for recognition of low arousal stimuli. Thus it appears that verbal recognition and visual recognition for low arousal stimuli are likely to produce similar levels of autonomic arousal.

Risky behaviors have served various evolutionary purposes throughout time (Ellis et al., 2012). Such evolutionary benefits for risky behavior may have been reduced, however, due to the development of societies that can create an increase in legal and social restrictions, and greater enforcement of these restrictions. Thus risky behaviors may be less valuable and more apt to elicit negative consequences. Thus if high sensation seekers are more likely to experience negative consequences than low sensation seekers, it would make sense that high sensation seekers have evolved better means of deceiving others. In other words, high sensation seekers may be more effective liars than low sensation seekers because lying is what allows high sensation seekers to continually engage in risky behaviors without enduring negative consequences.

The current study's findings also have practical applications. Because deception serves many different purposes across various situations, reliable identification of individuals' acts of deception would be of great use in particular situations, such as judicial rulings in legal cases that are contingent on stories from multiple sources (Gaspar & Schweitzer, 2013; Hartwig & Bond, Jr., 2014; Lewis & Saarni, 1993). Additionally, both engaging in and intending to engage in deception processes were shown to moderate arousal for high and low sensation seekers who revealed irrelevant and personally familiar information.

Thus, if the current study's findings are replicable, then profiling individuals on the sensation seeking personality trait prior to questioning and/or using a polygraph could potentially lead to detecting deception more accurately, as gauged by individuals' autonomic markers for questions that deal with revealing irrelevant and personally familiar information.

Limitations and Future Research

The current study has some limitations. The experiment's continuous predictor, sensation seeking, was categorized. Though categorizing sensation seeking facilitated our analysis of group differences, such categorization reduces the power of our findings, particularly differences attributed to high and low sensation seekers. Also, prior research has often focused on the top and bottom quartiles of a personality trait (e.g., Lawson et al., 2012). Such a data collection approach could allow for a more sensitive examination of differences between high and low sensation seekers.

Functional neuroimaging techniques have begun to associate specific brain activity with acts of deception (for reviews see Gamer 2014, & Rosenfeld, Ben-Shakhar, & Ganis, 2012; Ambach, Bursch, Stark, & Vaitl, 2010) though this area of research has not considered that sensation seeking may influence functional changes in the brain that indicate deception and memory processes. Future research should investigate whether sensation seeking can predict specific differences in deception and memory processes individuals utilize when attempting to deceive others by concealing information.

Conclusion

The present study investigated whether sensation seeking predicted differences in deception and memory processes. The use of irrelevant and personally familiar stimuli were intended to serve as control or contrast conditions for mock crime scenario stimuli. The present study was the first of its kind to assess whether sensation seeking directly influenced both deception and memory processes. The unanticipated results of sensation seeking influencing irrelevant and personally familiar arousal levels warrant the attention of future research, especially when considering that these arousal levels were influenced by deception processes. The most interesting finding, however, is that deception processes increased arousal levels for low sensation seekers, but decreased arousal levels for high sensation seekers. These results may support the notion of high sensation seekers developing unique mechanisms that allow them to use deception processes more covertly than low sensation seekers.

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APPENDIX A

Mock-crime Scenario (Deceptive group) Justification: You work for a U.S. government agency that watches government scientists to make sure that they are not selling top secret information to other countries. The agency has recently become suspicious of Dr. Jones who has been spending more money than his salary allows. You have been instructed to break into his office and examine whether he has a file that contains top secret information, and if possible, get copies of that information. Also, try not to be seen breaking into his office.

Errand Scenario (Innocent group) Justification: You have been working with your history professor, Dr. Jones, who is currently writing a book about the technological advances that made the United States the most powerful and wealthy nation in the world. Dr. Jones asked you to run up to his office and get copies of some documents out of his file cabinet. He also said that if anyone is around or comes up to his office wondering what you are doing, then tell the person that Dr. Jones asked you to get some information that he needs for his book.

Task (provided for both groups): Use the black key to unlock the main door that says *Authorized Staff Only*. Look around to see if anyone is in the main room upon entering. Once inside, look for Dr. Jones' office which is room number 250. Go to his office and unlock the door using the black key. Walk inside and find the file cabinet. Open only the second drawer and look for the file called *FALLOUT PROJECT*. Take the file out of the file cabinet making sure that you know exactly where to place it when you put it back. Open the file and examine its contents. If duplicates are found, than take a copy of each. Only take the original if no duplicates are available. Once you have taken information from the file, place any materials not needed back into the file in the same order that you took them out. Then place the file back into the second drawer in its original spot. Close the drawer. Grab the copies (or originals if no copies were available) and exit the office. Lock the office with the black key. Then walk out of the main room looking to see if anyone is around. Once out of the main room, lock the main door using the black key.