Score Reduction on Personality Tests After a Middle Warning Message: Exploring the Possible Mechanisms

by

Elissa Marie Hack

A thesis submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Master of Science

Auburn, Alabama
December 12, 2015

Keywords: Faking, warning message, physiological responding

Approved by

Jinyan Fan, Chair, Associate Professor of Psychology
Daniel Svyantek, Professor of Psychology
Jennifer Robinson, Associate Professor of Psychology

Abstract

Social desirable responding has posed a serious threat to the validity and utility of personality tests used as selection tools for organizations. There have been numerous attempts to circumvent this issue including forced-choice format, time restriction, and the implementation of a warning message. A recent method has involved implementing an identification, reasoning, and consequence warning message during the middle of the testing process and allowing the test taker to re-test. This has shown a decrease in test takers personality scores, who had been flagged as responding in a socially desirable manner, thereby increasing the accuracy of scores through a decrease in intentional distortion (Ellingson, Heggestad, & Makarius, 2012). What has not been examined, however, is the underlying mechanism behind this observed effect. This study attempted to determine the mechanisms through the measurement of psychological autonomic responses in conjunction with a self-report emotions survey.

Table of Contents

List of Tables

List of Figures

Introduction

Due to the ease of administration, lack of adverse impact as compared to cognitive

measures, and capability of predicting various measures of performance, the use of personality

inventories in personnel selection has become increasingly popular among employers over recent

years (Barrick & Mount, 1991; Bobko, Roth, & Potosky, 1999; Barrick, Mount, & Judge, 2001;

Hough & Oswald, 2008). In conjunction with their increasing popularity, however, there has

been concern regarding the relative ease to which faking behavior can arise on these non-

cognitive measures as well as how this faking behavior can impact the validity of scores in a

negative manner (Ellingson, Sackett, & Hough, 1999; Viswesvaran & Ones, 1999). Faking has

been defined as "the tendency to deliberately present oneself in a more positive manner than is

accurate in order to meet the perceived demands of the testing situation" (Fan, Gao, Carroll,

Lopez, Tian, & Meng, 2012, p.867).

In response to this there have been numerous strategies to attempt to address these issues

of faking. The following literature review will outline the various strategies that research has

utilized to attempt to manage dishonest responding; specifically a warning message component. I

will then expand upon the literature regarding the use of a warning message delivered during the

middle of the test that allows the respondents a chance for retest, as this will be the format used

for my research. There has been little research in regards to the possible mechanisms behind the

middle warning component; so I will outline the emotions literature and postulate which discreet

emotions I believe most likely at the moment of the warning message. Lastly I will outline how I

can use physiological measurements in conjunction with emotions surveys to advance the

literature regarding warning messages as deterrents for faking.

Literature Review

Measuring Faking

There have been recent attempts at both detecting and deterring faking behaviors. Paulhus' Impression Management (IM) and Self-Deceptive Enhancement (SDE) measures have been commonly used in an attempt to detect faking or socially desirable responding on personality measures. Both constructs have measures that attempt to identify respondents who are responding in a less than truthful manner on selection tests in order to gain favorable consideration; also known as response distortion. The construct of SDE, however, concerns the test-taker's tendency to characteristically view oneself in a positive light. IM, on the other hand, involves the deliberate effort to falsify one's responses to the test in order to gain an advantageous position (Barrick & Mount, 1996). For example, an SDE item may state, "I never regret my decisions," and the applicant would endorse the extent to which this was true. Most individuals at one time or another have regretted a decision, and therefore any endorsement stating otherwise can be considered socially desirable responding. Similarly, an example of an IM item may state, "I always tell the truth." This is most certainly not true for any person, so stating firm agreement with this statement can also be considered socially desirable responding. There, however, has been much debate as to whether these questions are actually indicative of dishonest responding. The format of the questions does not allow for a firm statement that an applicant was intentionally being deceitful. An applicant could truly make a point to never regret

3

anything in their life and therefore could be punished for responding honestly. This had led to a call for measures that are much more defensible in regards to dismissing applicants.

The questioning of the validity of these faking measures has resulted in alternative faking measures such as Bogus Statement inventory (Anderson, Warner, & Spencer, 1984; Dwight & Donovan, 2003) and Over-Claiming Questionnaires (OCQ; Paulhus, Harms, Bruce, & Lysy, 2003) have been proposed. Unlike IM and SDE scales, these measures have distinctly false and distinctly true items. Bogus Statement (BS) inventories involve a series of job related tasks that an individual can claim various levels of experience or knowledge. There are, however, non-existent tasks mixed in with genuine tasks. An example of a bogus statement, in which one would claim a level of experience with, would be something similar to, "Matrixing solvency files" (Anderson, Warner, & Spencer, 1984). This is a non-existent task; therefore, if the individual claims knowledge of this procedure, they are shown to be responding in a socially desirable manner. BS items are more targeted towards the construct of impression management, as the results are outright falsifications. Over-claiming questionnaires (OCQ) are very similar to BS items in that there is a mixture of true and non-existent elements that the individual claims familiarity with. OCQs, however, deal with general knowledge, such as people, events, and things, rather than specifically job-related items. An example of a non-existent OCQ would be to rate one's familiarity with, "cholarine" (Paulhus, Harms, Bruce, & Lysy, 2003). These new measures, while promising, have not yet been fully established as valid.

Managing Faking

There are primarily three categories in which faking mitigation procedures can be defined: reactive, proactive, and a combination of the two (Fan et al., 2012). The above four measurements of faking (BS, OCQ, IM, SDE) are examples of reactive measures, in which

4

faking is allowed to occur and then controlled for after-the-fact. Statistical correction and statistical modeling fall within this tactic.

In contrast to reactive measures, there has been an increase interest in the research of attempting to proactively address faking in the form of preventative measures. Examples of such include a pre-warning message, subtle items, and forced choice format (Fan et al., 2012). A pre-warning message attempts to address the issue of faking through warning test takers against dishonest responding before they begin the testing process. Subtle items attempt to prevent the applicant from identifying the specific criteria being measured and forced-choice formats attempt to avoid socially desirable responding by making all answers equally desirable (Christiansen, Burns, & Montgomery, 2005). As this study concentrated on warning messages, I will first describe the various standard pre-warning messages and then introduce the third faking mitigation strategy, as it is what I employed for my research.

The traditional format for presenting a warning to deter faking has been constructed using an identification and consequence component. Identification informs the test taker that there is an embedded social desirability measure that has the ability to detect dishonest responding, while the consequences component informs the test taker that there will be penalties if they are identified as fakers such as removal from the application process (Pace & Borman, 2006). In more recent literature, there has been an effort towards warning components that may be less aversive in regards to the test takers' perceptions of organizational justice. Pace and Borman (2006) identify three additional warning types to both detection and consequences. The "appeal to reason" approach involves encouraging individuals to respond in an honest manner because it is in both their and the companies best interest in order to find the best suited match. An "educational" warning, attempts to convey honest and open communication from the

organization to encourage honest responding in return. Lastly, an "appeal to morals" warning message encourages the test takers to view themselves as trustworthy and authentic individuals in an attempt to gain honest responses from the attempt to remain consistent with this perception.

These warning messages tend to have a more friendly tone than that of the more traditional approaches (Pace & Borman, 2006). An article by Dullaghan (2010), however, found that the detection and consequences warning was more effective in deterring faking, and did not have a significant impact on perceived procedural justice. Therefore, there has been a shift in the literature in which the component of the warning message is not the focus, but rather the timing.

More recently, there has been promising evidence for administering a warning component in the middle of the testing process as opposed to the more traditional pre-warning setup. This procedure is the third faking mitigation strategy and combines the components of the reactive and proactive categories. It is reactive in that it allows faking to occur in an initial block while measuring faking and proactive by then warning the individual that faking has been detected and give them a chance for recourse. The first research to explore this avenue was conducted by Butcher, Morfitt, Rouse, and Holden (1997). These researchers explored re-testing after a warning using the MMPI-2 in a real-world selection context. The MMPI-2 is a personality test that included multiple validity scales imbedded within. This study in particular focused on the K (defensiveness), and L (lie) scales to determine those that would be retested. Test-takers were applicants for an airline pilot position and were given the MMPI-2 as part of their pre-screening evaluation. If they were found to have a T score above a cutoff score on K or L their test was considered invalid and they were given a second MMPI-2 with further instructions resembling an identification and appeal to reason warning message (See Appendix A). Of the 72 applicants whose tests were considered invalid upon initial testing, 57 produced valid profiles

after retesting. The warning component as retesting resulted in more valid and interpretable results lending preliminary support to this new method (Butcher et al., 1997).

Landers, Sackett, and Tuzinski (2011) chose a similar mid-warning setup for their field study of applicants for managerial positions at a national retailer. These researchers examined the effects of warning and retesting on what they term "blatant extreme responding (BER)." The study had an impressive sample size of 32,311 with 20,993 who completed the test after the warning was implemented. Applicants who completed the measure within the first 13 months of testing only received a general warning message against faking before the testing process. Those who completed the measure after the 13-month mark were given the same pre-warning but were also given a pop-up warning based upon %100 BER for the first 1/3 of the test. This warning consisted of only an identification component. They were then given the opportunity to go back and change their answers accordingly. From this procedure stemmed three separate groups: those who had never answered with BER, those who had responded with BER and continued to do so, and those who initially responded with BER but changed their answers after receiving the warning message. The results showed a significant decrease in BER suggesting that a real-time warning does reduce applicants who have been responding in a socially desirable manner as well as confirming that faking does occur and matter in the real world selection context. There is an issue, however, with using BER as an indication of socially desirable responding in that there is no direct evidence that faking has occurred.

Another study conducted by Fan et al. (2012) also found that introducing a warning component after an initial testing block and giving individuals a chance for recourse caused a significant decrease in faker's personality scores upon retesting. The first study sample consisted of 157 real-world applicants for staff positions at a university in China. These applicants were

7

given a personality assessment, which included a bogus statement and impression management scale, as well as a measure of test fairness, face validity, test satisfaction, and test motivation. If the applicants were found to exceed the faking criteria after the initial block of the test, they were given a warning message (see Appendix A) and given the chance to retest. Those who were not flagged received a control message (see Appendix A). The results showed that flagged applicants reduced their scores significantly, while the non-flagged applicants score did not vary significantly from time 1 to time 2. To perform a true experiment, the researchers conducted a second study, which randomly assigned the warning and control message to applicants. The results demonstrated that those who were given the control message did not greatly reduce their scores regardless of their having been flagged. Those who received the warning message reduced their scores but the reduction was significantly greater for those who had been flagged as fakers. These results also lend support to the notion of a mid-test warning message to reduce the likelihood of faking. One issue that was not examined, however, was the mechanisms behind why test takers will reduce their scores after receiving this warning message. Could it be due to guilt from having lied, or fear that a continuation in their previous response pattern would remove them from the selection process?

In a very similar study to Fan et al. (2012), Ellingson, Heggestad, and Makarius (2012) examined whether retesting did lead to a more accurate representation of flagged individuals' true scores, as well as examined what emotional reactions were occurring at the moment of retest. Unlike the previous studies, this research was conducted using undergraduate students in the lab setting. There was, however, a deception component to attempt to motivate socially desirable responding from those who would do so in a real application setting. In the first study participants completed a baseline personality measure and trait guilt measure before the

deception component. They were then given the deception and told to do their best on the next portion of the personality test in order to be selected for a special task (see Appendix A). All participants were then asked to come back for the second session the next week to discover whether they were selected. Participants who scored above the threshold on the validity tests were flagged as fakers and were randomly assigned to either a control or warning condition. The warning message held an identification and mild consequence component (see Appendix A), while the control group was told that their data was lost due to a computer error and to complete the questionnaire again. All participants then completed a state affect measure for how they felt during the re-testing process. The results showed greater accuracy of the retest scores than the control condition score comparing the motivated condition to the baseline personality scores. This suggests that the warning message did deter individuals from continuing to fake. As for emotional reactions, state guilt was associated with greater accuracy of scores in the retest condition, whereas the control condition showed no relationship. State shame and state anger had no relationship with the accuracy of score, lending support to the hypothesis that guilt is the underlying emotion affecting score change.

In the second study business college students conducted the first personality assessment online as a baseline measure. The second portion of the study took part in a lab, where for the first half, participants were asked to analyze content commonly found on a resume and how it related to certain traits as a distractor task. After completing this first half, which was disguised as the main purpose of the study, participants were deceived into believing that the researchers were working with a company called Insat Corporation. They were asked to help with the development of a pre-screening measure for the company, and if they were interested in an internship position, their responses would be reviewed along with the program's needs. The

participants took the first portion of the personality test and were then presented with either a control or retest condition. Those in the control condition were told that there was a computer error and to please complete the survey again, while the experimental group was given a warning message with an identification component and asked to answer the questions again in order to be considered. There was very little accuracy change from time 1 to time 2 for the control condition. For the experimental condition, the scores for those that were flagged as fakers improved in accuracy upon retesting. Those who were not flagged, however, decreased the accuracy of their scores upon retesting.

This study was based off of the work done by Ellingson et al. (2012) and Fan et al. (2012). It combined the procedure put forth by Fan et al. with the deception component from the second study by Ellingson et al. (2012) in an attempt to further explore the internal mechanisms behind this score reduction. To attempt to discern what emotions are occurring in the moment of receiving the warning as well as the emotions following the warning, physiological responses were monitored and analyzed. This addition of physiological measures will greatly further the work done by Ellingson et al. in regards to the affective reasoning behind why applicants will reduce their scores. The second study conducted by Ellingson, which included the internship deception, did not include the trait guilt and shame scales. My study utilized the same deception component with physiological measurements to support the self-reported emotions scales.

Emotions

Bradley and Lang (2000) define emotions as "action dispositions, mobilizing the body for behavior, but in which the overt action itself is often delayed or totally inhibited." There are three dimensions to measuring emotional reactions. The first of these is arousal, which measures the amplitude of an emotion from calm to excited. The second is valence, which refers to the

10

perception of the emotion being positive or negative. Finally emotions can be categorized into specific dimensions encompassing both their valence and arousal called discrete emotions (Bradley and Lang, 1994). Not all valenced reactions can be established as emotions, however. Moods are distinguished from emotions in that "moods do not have specific and stable motivational functions, but only informational function" (Kreibig, 2010). Moods tend to be brought on slowly and are more enduring. Emotions, however, are short-lived and brought on by a sudden stimulus (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000). Moods, in contrast to emotions are changes in feelings that occur without any influence from, or on, autonomic responses. It, therefore, becomes vital to distinguish which reaction will occur in the proposed study. Due to the nature of the warning component being sudden and unexpected, we can infer that the physiological response being measured at the moment of the warning message is, in fact, and emotion rather than a mood.

The response at the moment of the warning message is likely an emotion, but the next step is to examine how to classify that emotion. There have been countless theories regarding what emotions are primary and discrete, and what emotions are secondary or dimensional. Early researchers such as Watson (1924) argued that there could only be emotions based upon directly observable behavior prompting the discrete categories of fear, rage, and sexual performance. More modern taxonomies include a much broader range of classifications. Kemper (1987) argued that there were four primary emotions that paired with corresponding secondary emotions. The four primary emotions are anger, fear, depression and happiness, while the secondary corresponding emotions in order are shame, guilt, resignation, and pride as well as others. Paul Ekman (1992) argues for six distinct emotions such as anger, fear, sadness, enjoyment, disgust, and surprise with the possibility of contempt, shame, guilt, awe, and

11

embarrassment as other distinct constructs. For the purposes of this study I will concentrate on the emotions of guilt, fear, and anger in regards to each cell of the study design, as they are the most relevant (to be discussed and justified in detail subsequently). Before I introduce how I believe emotions will play a role in this study, a brief introduction to the research design is warranted. This study consists of individuals who will be flagged as fakers or non-fakers and be randomly given either a warning or control message resulting in a 2x2 design with 4 separate cells. Every cell will be presented with an initial block and a main block of personality scores. Therefore a hypothesis will be proposed for each cell, with a focus on score reduction from the initial block to the main block, as each one merits a different explanation for each resulting emotion. However, hypothesis 1 will first be a replication of the previous findings by Fan et al. (2012).

Hypothesis 1: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on score reduction such that relative to the control message, the warning message should lead to larger score reduction among fakers than among non-fakers. In other words, I expect that fakers receiving the warning message to exhibit the largest score reduction, followed by non-faker receiving the warning message, with fakers and non-fakers receiving the control message displaying similar, but smallest score reduction.
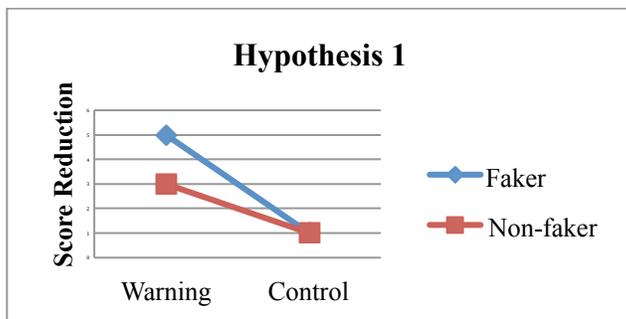

Figure 1: Hypothesized score reduction interaction

Similar to Fan et al.'s study, there should be a carryover effect for the three other personality measures (emotional stability, agreeableness, and extroversion) present only in the main block. There should be similar mean score differences between the warning and control groups should be similar for the personality items in both the initial and main block (conscientiousness and openness) and the items only entered in the main block (emotional stability, agreeableness, and extroversion). Therefore I propose:

Hypothesis 2: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on personality scores such that relative to the control message, the warning message should have a larger effect on the remaining three personality scores among fakers than among non-fakers. In other words, I expect the mean score difference in fakers receiving the warning or control message to be larger than the mean score difference between non-fakers receiving the warning or control message.
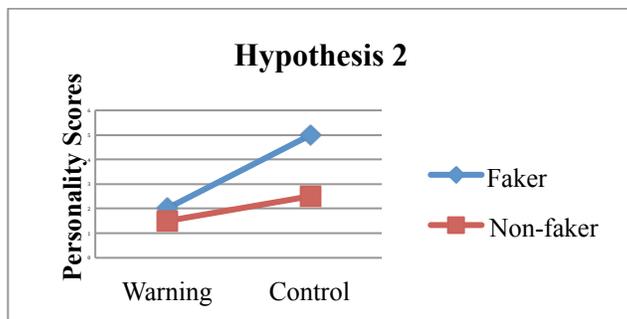
Figure 2: Hypothesized personality score interaction

I propose, however, that several discrete emotions (guilt, fear, and anger) might be potentially relevant to the above interaction effect. Guilt is a discrete self-conscious emotion that arises from displaying behavior that is contrary to certain expectations (Tangney, 1990). It is social and interpersonal in nature stemming from some type of differentiation from cultural ethics and norms (Barrett, 1995; Lewis, 2000; Tangney, 1999). Lying is a cultural faux pas, and therefore when an individual is responding dishonestly and this is confronted, such as with

faking and the warning message, it becomes likely that the individual will express guilt. The guilt felt from having been dishonest will lead to those individuals subsequently reducing their scores (that is, responding more honestly) when given a second chance. As the cutoff score for determining fakers vs. non-fakers is arbitrary, and often at a moderately high level to avoid a false positive, there may also be a small level of guilt experienced by those who are classified as non-fakers. Similarly, because those who are classified as fakers must be responding at a very high level of dishonesty in order to be classified as such, the guilt response will be higher than those who were not flagged. Therefore I propose:

Hypothesis 3: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on guilt such that relative to the control message, the warning message should lead to larger reported feelings of guilt among fakers than among non-fakers. In other words, I expect that fakers receiving the warning message to exhibit the largest self-reported guilt, followed by non-fakers receiving the warning message, with fakers and non-fakers who receive the control message displaying similar, but the smallest reported levels of guilt.
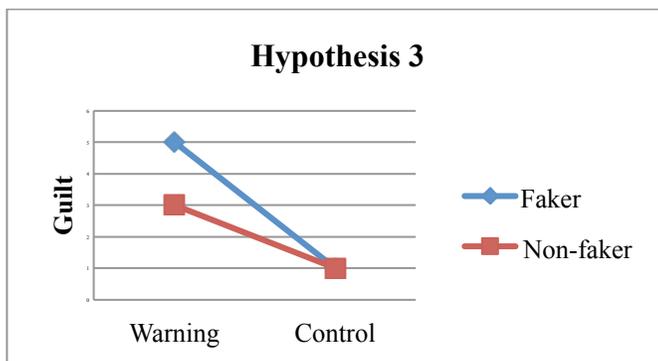

Figure 3: Hypothesized guilt interaction

While guilt is expected as the primary emotion for those who have been responding dishonestly and are shown the warning message, fear could potentially be another mechanism

and will therefore be explored in this study. Kemper (1987) proposed that emotions such as fear stem "from interaction outcomes where actors are subject to the power of others because that power is greater than their own," Due to the detection and consequences portion of the warning message, and individual may feel fear because they are subject to the decisions of the test administrators in terms of application acceptance. An applicant could potentially become fearful of those consequences that come with continuing to fake, and subsequently reduce their scores because they feel threatened. This is in contrast to the idea that individuals will lower their scores due to moral reactivity from the warning itself. Therefore I propose a second mechanism for test-takers:

Hypothesis 4: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on fear such that relative to the control message, the warning message should lead to larger reported feelings of fear among fakers than among non-fakers. In other words, I expect that fakers receiving the warning message to exhibit the largest self-reported fear, followed by non-fakers receiving the warning message, with fakers and non-fakers who receive the control message displaying similar, but the smallest reported levels of fear.
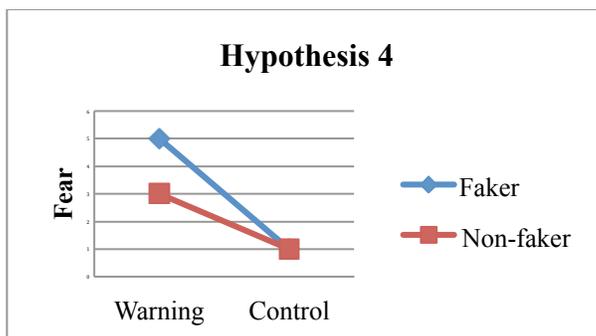

Figure 4: Hypothesized fear interaction

While guilt and fear are the proposed mechanisms behind those who fake and are given the warning component, the question arises as to what will be the mechanisms behind those who do not fake yet still receive the warning message. Kemper (1987) states that anger stems from "interaction outcomes in which expected, customary, or deserved status has been denied or withdrawn by another actor who is seen to be responsible for the reduced status." Anger is a result of someone else's actions that threaten an individual's desires unjustly. When an individual is told that their expected outcome of doing well on the test may be taken away due to an unfounded claim of dishonesty, that individual may express a negative reaction of anger. Those individuals who were performing honestly on the test, with the desire to gain employment from the potential internship opportunity, will feel anger when they feel they are wronged and perceive that they must reduce their scores in order to avoid negative consequences. This score reduction denies them of what they feel is their deserved status as the result of another actor. Therefore I propose:

Hypothesis 5: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on anger such that relative to the control message, the warning message should lead to larger reported feelings of anger among non-fakers than among fakers. In other words, I expect that non-fakers receiving the warning message to exhibit the largest self-reported anger, followed by fakers receiving the warning message, with fakers and non-fakers who receive the control message displaying similar, but the smallest reported levels of anger.
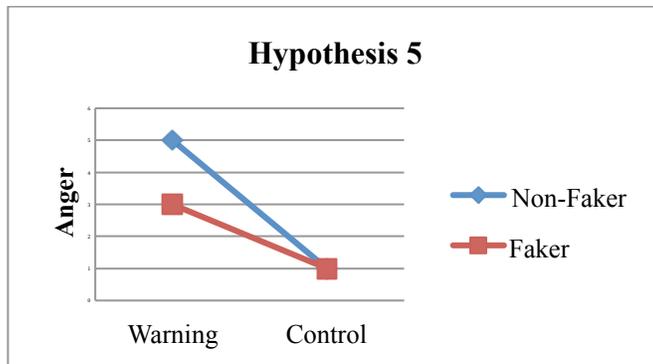
Hypothesis 5

Figure 5: Hypothesized anger interaction

While the initial emotions felt will be anger, I posit that the actual emotion that acts as the mechanism for score reduction will be a fear of the repercussions for not doing so. The test-taker who has been responding honestly in the initial testing block will initially feel angry when accused of providing false information, but will then feel that they must change their answers for fear of being selected out of the testing process.

The final two cells that result from this study design are those in the control group who are classified as either fakers or non-fakers. The control message is displayed as a neutral random system check and should therefore result in no affective response. In order for an emotion to arise, the stimulus must elicit arousal and valence. The wording of the control message is neither calming nor exciting and neither positively nor negatively worded.

There has been a call in recent Industrial and Organizational psychology literature to move away from relying solely on self-report and explore other alternative measures. Therefore, in order to not only replicate, but further, the work done by Ellingson et al. (2012), I collected physiological data of the autonomic nervous system (ANS) in order to support the self-report findings and differentiation of the various emotions.

17

Physiology

The association between emotions and autonomic responses was first suggested by William James (1884). Since that time, there has been much debate regarding the validity of classifying emotions through the measurement of physiological responses. James (1884) argued that various autonomic responses produce varying emotions, while Cannon (1927) argued for the opposite trajectory, where varying emotions produced the varying autonomic responses. Others have argued that it is neither but rather a combination of the two with both theories being relatively correct (Schachter & Singer, 1962). Regardless of the directionality, there is relative consensus that autonomic responses and emotions are associated with one another. Cacioppo, Berntson, Larsen, Poehlmann, and Ito (2000) argue that there is no question of "whether emotion-specific autonomic patterns occur, but under what conditions such patterns occur." Barrett (2012) argues that there is a multitude of evidence indicating that each emotion category has a unified biological basis. She defines emotions as ontologically subjective categories created by humans to make meaning of physical events and to prescribe actions (Barrett, 2012). Emotions allow us a quick cognitive processing of outside stimuli in order to prompt biological reactions for reactive behavior. While the connection between emotions and physiological reactions has been widely accepted, the exact relationship between discrete emotions and specific responses is less clear. Despite the broad wealth of information related to the psychophysiology of emotion, there is yet to be consensus regarding the specific physiological pattern for each specific emotion. For example fear can induce either a fight, flight, or freeze response; therefore context becomes imperative to understanding and interpreting the psychophysiology of emotions (Bradley & Lang, 2000).

Borrowing form the Funkenstein hypothesis (Funkenstein, 1955), Kemper (1987) argues that the two emotions fear and anger can be differentiated physiologically due to the various neurotransmitters involved in eliciting these emotions. The release of the neurotransmitter epinephrine is associated with fear, while the release of norepinephrine is associated with anger. Both neurotransmitters activate the sympathetic nervous system but in varying ways. A study by Ax (1953) sought to differentiate the specific physiological reactions between the two constructs. The results showed that for anger, there was a greater average reaction for heart rate falls, the number of galvanic skin responses, and muscle tension increases. For fear there was a greater average for skin conductance increases, number of muscle tension peaks, and increase in respiration rate. However, other scholars argue that there is no way to confidently claim differential autonomic responding among various emotions as there have been inconsistent patterns in the literature. Some claim this is due to the presence of moderator variables (Cacioppo et al., 2000), while others state that it is because of the impossibility of distinguishing emotions through autonomic responding (Feldman-Barret, 2006).

In an attempt to address this issue, a recent review of autonomic responding was conducted by Kreibig (2010) in an attempt to consolidate the vast literature and define a clear differentiation among the discrete emotions. She compared 134 publications examining autonomic responses for various discrete emotions and presented the results of the most consistent patterns found for 22 various emotional reactions. The results of this review article were the basis upon which I proposed my research questions regarding the physiological patterns I expected to see in my study. Any hypotheses are presented as exploratory as there is no consistent autonomic response pattern in the physiological literature, and because many of my hypotheses regard a timing effect. Therefore, the results found regarding physiological response

19

patterns are there to provide supporting evidence to the self-reported emotions provided by the participants.

The three discrete emotions that I expect to see stem from the hypotheses proposed in the emotions portion; which are fear, anger, and guilt. Kreibig (2010) found a specific autonomic response pattern for each of these emotions that I will summarize in the table below. An upwards-facing arrow represents an increase from the baseline, a downward facing arrow a decrease from the baseline, and a dash is no change from the baseline.

	Heart Rate	Skin Conductance	Cardiac Output
Fear	⬆	⬆	⬆
Anger	⬆	⬆	⬇
Guilt	⬆	⬆	—

Figure 6: Hypothesized physiological responses

For the emotions anger, fear, and embarrassment (which can be considered part of the family of guilt and shame), there was no differentiation between heart rate and skin conductance. Both measures increased for each of the emotions, therefore I propose:

Exploratory Hypothesis 1: Relative to the control condition, the warning message should increase heart rate and skin conductance from the baseline measure to during the presentation of the warning message for both fakers and non-fakers.

Kreibig's (2010) study found that after consolidation, the only distinguishing physiological factors between fear, anger, and embarrassment were in regards to total peripheral resistance and cardiac output. Therefore, change in cardiac output will be the main physiological response examined in this set of exploratory hypotheses. When anger is directed out ward or away from the self, it was consistently found that there was a decrease in stroke volume and cardiac output. Hypothesis 4 postulates that the emotion felt at the moment of the warning

20

message, for those who are classified as non-fakers, will be anger. Therefore if anger is the initial emotion evoked during the presentation of the warning message, the following is expected:

Exploratory Hypothesis 2: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on cardiac output such that relative to the control message, the warning message should lead to a larger decrease in cardiac output from the baseline measure to the presentation of the warning message among non-fakers than among fakers. In other words, I expect that non-fakers receiving the warning message to exhibit the largest decrease in cardiac output, followed by fakers receiving the warning message, with fakers and non-fakers who receive the control message displaying similar, but the smallest decrease in cardiac output.
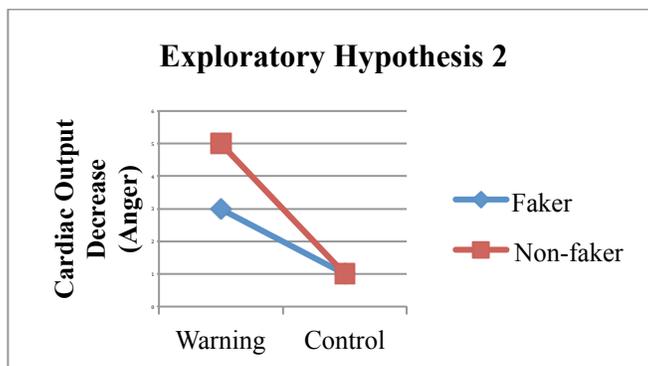
`   Figure 7: Hypothesized cardiac output interaction for anger

As stated previously, while anger is proposed as the initial emotion felt when viewing the warning message, fear of punishment will act as the actual mediator for score reduction (Hypothesis 3). I propose that these emotions can be differentiated physiologically through the timing of the measures. The initial reaction for this specific cell will be anger, however because the proposed mechanism is fear of punishment, I believe fear will present itself after the warning

message and during the main block when actual score reduction is taking place. For fear, cardiac output consistently increased across the studies examined (Kreibig, 2010). Therefore I propose:

Exploratory Hypothesis 3: There will be an interaction effect between faking status (faker vs. non-faker) and message type (warning vs. control) on cardiac output such that relative to the control message, the warning message should lead to a larger increase in cardiac output from the baseline measure to the beginning of the main block among fakers than among non-fakers. In other words, I expect that fakers receiving the warning message to exhibit the largest increase in cardiac output, followed by non-fakers receiving the warning message, with fakers and non-fakers who receive the control message displaying similar, but the smallest increase in cardiac output.
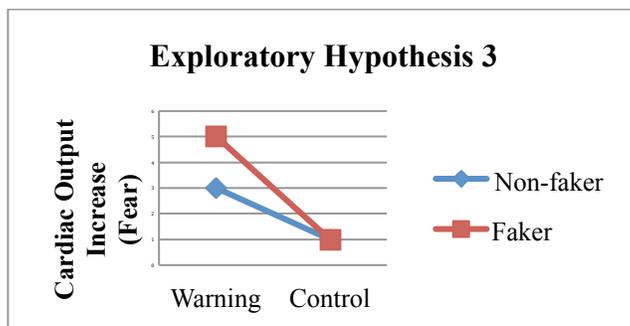

Figure 8: Hypothesized cardiac output interaction for fear

Both guilt and fear were proposed as potential mediators for those who are flagged as fakers and given the warning message. If both emotions are occurring at the same moment, then it becomes impossible to differentiate either through physiological recordings. If however different individuals use different mechanisms to reduce their score then there is a possibility for differentiation. One emotion that was examined in the meta-analysis (Kreibig, 2010) was embarrassment, which is considered within the family of guilt and shame (Ekman, 1992). Embarrassment differed from anger and fear in that there was consistently no change in either

direction for cardiac output. Therefore, if the mechanism through which individuals reduce their scores is primarily guilt, I propose:

Exploratory Hypothesis 4: Faking status (faker vs. non-faker) will interact with message type (warning vs. control) to influence change in physiology such that there will be an increase in heart rate and skin conductance but no change for cardiac output from their baseline measure to the main block for fakers who are warned.

Finally the control message is designed specifically to be a neutral stimulus and therefore I propose:

Exploratory Hypothesis 5: Test-takers that are flagged as non-fakers and fakers and are shown the control message will have no change in cardiac output, heart rate, heart rate variability, or skin conductance from their baseline measure.

The contribution of this study will give us a greater insight into not only the warning component, but to the entire testing process through utilization of techniques rarely utilized in the industrial and organizational psychology field. I-O psychology has traditionally been dependent on self-report measures to gain insight into the cognitive processes of an individual. This has implications on validity in multiple ways. It seems almost counterintuitive to use a self-report measure to evaluate social desirable responding considering self-report are the most easily faked measures. The utilization of physiological measurements will give us unbiased incremental validity above and beyond simple self-report measures. The addition of physiological measures will contribute to the work previously done by Ellingson et al. (2012) in which she discovered guilt as a possible mechanism. This study however goes beyond the scope of Ellingson's study in that it examines multiple emotions such as anger and fear. It looks not only at the emotions felt when accurately given a warning for faking but also the emotions for being unjustly identified as

a faker. In addition to examining multiple emotional reactions, it has the potential to examine

emotional reactions over time; a dimension unattainable through self-report.

Method

Participants

The sample consisted of approximately 87 undergraduates at Auburn University. They were given extra credit as well as entered into a random cash drawing.

Procedure

Participants were recruited through the SONA web system. Test takers were asked to come into the lab under the impression that they were to be given two separate surveys. The first step was to attach the test-takers to the physiological recording equipment. The second step was a resume content analysis and was used for the purposes of both a distractor and to obtain the individuals baseline physiological measurements. After the resume content analysis I entered the room and begin a deception component to make the participant believe that they were potentially applying for a paid summer internship. The deception component was introduced in order to imitate a true application situation as closely as possible in a lab setting. The participant was informed that they were participating in the second survey in order to help a ruse corporation develop and finalize their pre-screening assessment for selecting and recruiting college students into their paid summer internship program. The participants were told that in exchange for their assistance, they would be given the opportunity to indicate an interest in the position and would be given early consideration if they performed well. This element was to attempt to re-create the motivation that is felt in a real-world application setting.

Participants then began the testing process, which included an initial block of personality (conscientiousness and openness to experience), bogus statement, foil, self-deceptive enhancement, and impression management measures. After the initial block, participants were randomly assigned to either the warning or control condition, in which they received the detection and consequences warning or a control, which states that the interruption is simply a random system check. Both conditions had been setup to display for 45 seconds each in order to control for a potential length of interruption confound. The warning component included the traditional identification and consequences component. The first reason being that this method has shown validity above other styles of warning messages (Dullaghan, 2010) and the second is that due to its more harsh tone, it was more likely to evoke the emotional reaction attempting to be discerned from the warning process. After the warning/control message all participants were then guided through the main block, which once again contained the personality (All Big 5 measures), bogus statement, OCQ foil, self-deceptive enhancement, and impression management measures. Fan et al. (2012) found that there was no need to include the full set of personality items in both blocks and found some support for a carryover effect of the warning on all scales. Therefore a similar procedure was utilized in this study. After the participants had completed the main block of the survey, they were debriefed as to the true nature of the study and informed of the deception. The participants were then asked to complete a brief emotions survey and thanked for their participation.

Measures

IPIP-50: Big Five personality measure (Goldberg, 1992): The International Personality Item Pool is a measure used to determine an individual's score on the latent Big Five personality constructs which include: openness to experience, conscientiousness, extraversion,

26

agreeableness, and emotional stability. In the initial block, 20 (10 conscientiousness, 10 openness) questions from the IPIP-50 will be included. In the main block, all 50 questions will be included.

Impression Management and Self-Deceptive Enhancement (Bing et al. (2011); Paulhus (1984); Crown and Marlowe (1960); Paulhus (1988)): 10 impression management and 10 self-deceptive enhancement questions will be included in both the initial and main blocks and are interspersed within the Big 5 personality questions. 7 of the impression management and 5 of the self-deceptive enhancement items are from Bing et al. (2011) and the other 6 were chosen from Paulhus's (1988) BIDR-6.

Bogus Statement Scale (Yuan et al., 2015): The bogus statement scale is disguised as a task experience survey and will include questions that are genuine tasks and tasks that are fabricated, in which individuals can rate their familiarity. Rating familiarity with fabricated items may indicate that an individual might be responding in a socially desirable manner. An example of a genuine task question that one would rate, on a 5-point Likert scale, familiarity with, would be "Create a presentation using Microsoft PowerPoint," while a fabricated task example is "Setting up a teleconference meeting using MeetPoint." The items included on the task experience survey relate directly to workplace knowledge unlike FOILs.

The Positive and Negative Affect Scale-X (Watson & Clark, 1999): A self-reported emotions survey will be included at the end of the study to provide supporting evidence for the results of the physiological analysis. The scale consists of various words that describe different feelings, which correspond to the basic emotions of: fear, hostility, guilt, sadness, joviality, self-assurance, and attentiveness. Example words for the fear scale would be "frightened" or "nervous," while an example of joviality would be "happy" or "joyful". Participants rate their

27

level of arousal when seeing either the control or warning message on a 5-point Likert scale from "very slight or not at all" to "extremely" for each word. The Cronbach alphas for each of the sub-scales were as follows: Joviality α= .95, Hostility α= .85, Attentiveness α= .78, Self-assurance α= .80, Sadness α= .48, Fear α= .89, and Guilt α= .90.

The Personal Feelings Questionnaire (Harder & Zalma, 1990): A self-reported state guilt and state shame scale. This scale was presented with the PANAS-X on the same 5-point Likert scale and included items such as "embarrassed" or "intense guilt" for the guilt sub-scale and "feeling stupid" or "self-conscious" for the shame sub-scale. The alpha for the guilt scale was α= .82 and α= .87 for the shame scale.

Fear of Punishment (Fan et al., 2015): A self-reported survey regarding the extent to which test-takers felt they had to change their answers. Participants were asked to rate on a 5-point Likert scale the extent to which they agreed with statements such as, "The system message I received in the middle of the test made me very concerned about possibly failing the psychological test." The alpha for fear of punishment was α= .94.

Manipulation Check: The respondents will be asked to indicate honestly to what extent that they believed the deception component of the study.

Skin Conductance (Biopac product #EDA100C-MRI): Two electrodes will be placed on the third and fourth finger and measure electro-dermal response. This measure will digitally record sympathetic arousal onto an hp computer.

Heart Rate Variability (Biopac product #EMG100C-MRI): Two electrodes will be used to measure heart rate. One electrode will be placed on the right collarbone, and the other on the participants left rib. The measure will digitally record parasympathetic activity.

Impedance Cardiography (Biopac product #NICO100C-MRI): Two electrodes will be placed on the back of the neck, and two on the lower back of the participants as a measure of sympathetic arousal.

Respiration (Biopac product #RSP100C): Respiration will be measured with a respiration belt wrapped around the participants' upper waist. The measure will offer greater insight into heart rate variability.

Analytic strategies

All moderation hypotheses were analyzed using linear regression with the independent variable and moderator variable entered into the first block, and the product term of the two entered into the second block. The manipulation conditions were dichotomously scored with warning at 1 and control message at 0. Score reduction for conscientiousness and openness was calculated by subtracting the total score of the second, or main, block from the total score of the first, or initial, block. Personality scores for the other three big five dimensions were analyzed using the total score for the main block. The impression management scale, as well as the bogus statement scale determined fakers. For the impression management scale the overall mean score was calculated for each individual. A separate variable was created to dichotomously score these individuals into faker versus non-faker based upon normative data collected by Yuan et al. (2015) The mean and standard deviation for Yuan et al.'s (2015) study were 3.0758 and .57658 respectively. Therefore in the current study, individuals were flagged as IM fakers and given a score of 1 if they met or exceeded 1SD above this normative mean. For the bogus statement scale, scores were first recoded dichotomously. If individual's claimed any knowledge (or a score greater than 1) on a bogus item, they were given a score of 1. They were then further classified into a BS faker if they endorsed 1 of the four bogus statements in the initial block.

Classification of fakers for the overall study was based upon IM or BS fakers. Self-reported emotions were calculated using the composite score for each of the subscales.

Physiological analyses were performed using Acqknowledge Software. Focus areas were created for each portion of the study resulting in the following sections: baseline, deception, initial block, manipulation, main block, debriefing, and emotions survey. One person created the focus areas for all participants in the study to ensure consistency. If there was an interruption in the data due to factors on the part of the participant such as talking or coughing, that section was left out of the analyses and multiple focus areas were created for that section. For example if a participant coughed in the middle of the baseline measure, two focus areas would be created for that phase labelled baseline 1 and baseline 2. These multiple sections would then be combined together for further analysis.

LF, VLF, HF, VHF, and RSA were analyzed using the multi-epoch HRV and RSA-Spectral analysis. If there were multiple sections within each phase of the study, those numbers were averaged together as the total score for that phase. A filter variable was constructed for the participant data that did not record properly. EMG data considered to have not recorded properly were coded by one individual who examined the measurement graph for every participant and noticed a clear and apparent lack of a decipherable heartbeat. LF and VLF have traditionally been interpreted as representing sympathetic cardiac control. LF is said to represent "oscillations related to regulation of blood pressure and vascomotor tone" while VLF is understood to relate to "thermoregulation and kidney functioning" (Reyes del Paso, Langewitz, Mulder, Roon, & Duschek, 2013). There have been recent findings, however, to suggest that these measures of heart rate variability are not quite as straightforward to interpret as once thought. Reyes del Paso et al. (2013) argue that LF is actually influenced by the parasympathetic nervous system, while

Billman (2013) argues that it is a convoluted mix of both sympathetic and parasympathetic influences. Therefore, for this analysis, LF and VLF will be interpreted in terms of its additional support to patterns formed by other, more straightforward, measures.

The literature regarding HF and VHF is much more consistent, and it is widely held that these components of HRV stem from a vagal origin, and are therefore representative of cardiac parasympathetic tone and the effects of respiration on heart rate (Reyes del Paso et al., 2013). HF and VHF will be analyzed in terms of an increase or decrease from baseline, which, when analyzed as a pattern with the other measures, will lend support to either an increase or decrease in parasympathetic activity.

Respiratory Sinus Arrhythmia (RSA) is reflective of "tonic and phasic vagal influences on the heart" (Overbeek, van Boxtel, & Westerink, 2012). There has been substantial variability in the emotions literature regarding RSA and it has been suggested that this could be based on the induction method, situation, as well as various other inconsistencies across studies (Overbeek, van Boxtel, & Westerink, 2012). Therefore, RSA will be analyzed in terms of its contribution to other measures of physiological responding and interpreted according to patterns that arise which are consistent with those found in Kreibig's (2010) review article.

BPM and PEP were calculated using the impedance cardiography pre-ejection period analysis. Similar to the EMG analyses, multiple sections for each phase were combined together and given an average for each measure. A filter variable was created for impedance cardiography similarly to the HRV/RSA method. Participant's data were coded based upon the clear distinction of having a properly recorded waveform versus having no recording at all, or an uninterpretable waveform resulting from improperly placed electrodes. Beats per minute (BPM)

31

or heart rate is dependent on autonomic neural regulation, and is controlled by the balancing act between both the PNS and SNS (Acharya, Joseph, Kannathal, Lim, & Suri, 2006). Increases in heart rate represent an increase in SNS and subsequent decrease in PNS, while a decrease in heart rate represents the reverse (Acharya, Joseph, Kannathal, Lim, & Suri, 2006). Therefore, BPM will be interpreted in terms of its pattern with other measures and compared to Kreibig's (2010) article in an attempt to discern any emotions.

Pre-ejection period (PEP) is the "interval from the onset of the ECG Q-wave to the onset of left-ventricular ejection" (Allen, Fahrenberg, Kelsey, Lovallo, & Doornen, 1990). It is inversely related to myocardial contractility and therefore relates to sympathetic influences on the heart (Newlin & Levenson, 1979). This measure, similar to the others, will be interpreted in accordance to its contribution to the overall pattern of autonomic responding.

Skin conductance responses (SCR) represent changes in eccrine sweat gland activity stemming from the sympathetic nervous system (Khalfa, Isabelle, Jean-Pierre, & Manon, 2002). This measure will provide the most useful data in regards to interpreting results, as it is solely influenced by the SNS. To analyze skin conductance, the waveform was resampled from 1K Hz to 15.67 Hz on the EDA channel, as a frequency above 10Hz is recommended (Fowles, Christie, Edelberg, Grings, Lykken, & Venables, 1981). The number of skin conductance responses was then counted based upon a 45 second interval. The warning and control messages were standardized at 45 seconds across every participant so all skin conductance responses were used for that focus area. For the baseline and main block, the last 45 seconds of the baseline and the first 45 seconds of the main block (immediately following the manipulation) were used for comparison. The results from this analysis will provide direct insight into whether the SNS or

PNS is being activated. For all physiological analyses, a paired samples t-test was used to

evaluate any group differences from the baseline to the manipulation.

<center>**Results**</center>

Manipulation check

At the end of the survey participants were asked if they would be interested in the paid summer internship position. Of the 87 participants, 35 (40.2%) indicated yes, while 52 (59.8%) indicated no. After the debriefing, participants (n=84, 3 missing) were asked to complete a short survey regarding the extent to which they believed the internship position to be real. The first question asked was, "To what extent did you believe that Dr. Fan is collaborating with Insat Cooperation to gather data?" 65.5% stated they believed it, 11.9% stated they somewhat believed it, 19% stated that they were skeptical, and 3.6% stated that they did not care. The second question asked was, "How convinced were you that the job opportunity offered to you was real?" 50% stated that they believed it, 25% said they somewhat believed it, 19% stated that they were skeptical, 3.6% stated that they did not believe it, and 2.3% stated that they did not care. It must be kept in mind that these questions were asked after they had been debriefed, and therefore the answers may be slightly biased towards disbelief. Overall, however, it seems as though the manipulation mostly worked for a majority of the participants.

Hypothesis testing

The first hypothesis stated that there would be an interaction effect between faking status and message type on score reduction. This was not supported for conscientiousness score reduction or openness score reduction (see Table 1). The directionality of the score reduction,

<center>34</center>

however, is consistent with what was hypothesized. Independent t-tests show that those in the warning condition had significantly higher score reduction than those in the control condition. Those in the warned-faker group had the highest overall score reduction followed by warned non-fakers. Those in the control groups actually showed a very slight increase in their scores from test-to-retest (see Table 2).

The second hypothesis stated that there would be a carryover effect in the mean score differences of the two treatment groups for the three personality variables not included in the initial block and the score on those that were included in both blocks. This hypothesis was not supported.

The third hypothesis stated that there would be an interaction effect between faking status and message type on self-reported feelings of guilt such that, guilt would be highest for warned fakers, followed by warned non-fakers, and the smallest but similar amount for those in the control condition. This hypothesis was not supported (see Table 1). The directionality of the means was consistent with what was hypothesized for the PFQ measure of guilt, but not for the PANAS-X measure of guilt. For the PANAS-X measure of guilt, those who were warned non-fakers actually reported the highest level of guilt followed by warned fakers, and those in the control group reporting a similar and very low score (see Table 2). An independent t-test showed that those in the warning condition showed significantly higher reported levels of guilt than those in the control condition (see Table 2).

The fourth hypothesis proposed that self-reported fear would be highest for warned-fakers, followed by warned non-fakers, and the control groups having the smallest but similar results. This hypothesis was not supported (see Table 1). The PANAS-X measure of fear, similar

to the guilt measure and contrary to the hypothesis, showed the highest mean for warned non-fakers, followed by warned-fakers, and similar but the smallest averages for those in the control group. The fear of punishment scale, however, corresponded to what was hypothesized with warned-fakers having the highest average (see Table 2). All measures of fear were significantly higher for those in the warned groups than for those in the control group (see Table 2)

Hypothesis five predicted that self-reported feelings of anger would be highest for warned non-fakers, followed by warned fakers, and the control groups having the smallest scores. This hypothesis was not supported (see Table 1). The self-reported means are consistent with the pattern that was hypothesized. Those who were warned non-fakers did report the highest level of hostility, followed by those in the warned faker group. Those in the control group reported similar and very low levels of anger (see Table 2). Anger was significantly higher for those in the warning condition than for those in the control condition (see Table 2).

While not hypothesized, shame was also measured and the results show that warned fakers and non-fakers show a similar level of self-reported shame that is higher than those in the control groups. The interaction effect, however, was similarly non-significant (see Table 1) but the independent t-test between warning and control groups was significant (see Table 2).

Table 1: *Moderated Regression Analysis*

Model	b at Entry	R^2	F	ΔR^2
Step 1 (Conscientiousness Reduction)		.239	13.181**	
Warning	2.771**			
Faker	.498			
Step 2		.241	.181	.002
Warning × Faker	.481			
Step 1 (Openness Reduction)		.208	11.004**	
Warning	1.969**			
Faker	.382			
Step 2		.219	1.159	.011
Warning × Faker	.943			

Step 1 (Emotional Stability)		.177	9.062**	
Warning	-3.198*			
Faker	5.333**			
Step 2		.203	2.632	.025
Warning × Faker	4.651			
Step 1 (Extraversion)		.068	3.051†	
Warning	-3.643*			
Faker	2.323			
Step 2		.068	.054	.001
Warning × Faker	-.818			
Step 1 (Agreeableness)		.157	7.840**	
Warning	-.905			
Faker	3.552**			
Step 2		.182	2.498	.025
Warning × Faker	-2.882			
Step 1 (Guilt)		.135	5.132**	
Warning	2.159**			
Faker	-.036			
Step 2		.136	.091	.001
Warning × Faker	-.417			
Step 1 (Fear)		.058	3.139*	
Warning	1.768*			
Faker	-.389			
Step 2		.064	1.443	.019
Warning × Faker	-1.731			
Step 1 (Anger)		.281	13.508**	
Warning	3.660**			
Faker	-.385			
Step 2		.285	.382	.004
Warning × Faker	-.888			
Step 1 (PFQGuilt)		.226	10.047**	
Warning	2.265**			
Faker	.298			
Step 2		.227	.162	.002
Warning × Faker	.424			
Step 1 (Fear of Punishment)		.480	29.084**	
Warning	7.909**			
Faker	2.006 †			
Step 2		.483	.300	.003
Warning × Faker	1.212			
Step 1 (Shame)		.271	12.984**	
Warning	6.259**			
Faker	.068			
Step 2		.271	.003	.000
Warning × Faker	.137			

Note. All dependent variables above are continuous variables. †p<.10 *p<.05 **p<.01

Table 2: *Means and standard deviations of self-reported emotions surveys*

	Warned fakers		Warned non-fakers		Control fakers		Control non-fakers	
	M	SD	M	SD	M	SD	M	SD
Guilt (PANAS-X)	8.22	3.63	8.46	4.22	6.24	0.75	6.06	0.25
Fear (PANAS-X)	7.96	2.34	9.23	5.96	6.89	1.41	6.44	0.73
Anger (PANAS-X)	9.59	3.89	10.43	4.65	6.3	0.66	6.25	0.58
Guilt (PFQ)	8.65	2.76	8.14	3.42	6.21	0.54	6.13	0.50
Shame (PFQ)	17.57	6.73	17.43	8.00	11.25	1.77	11.25	1.69
Fear of Punishment	15.70	5.76	13.08	5.92	7.28	2.67	5.87	1.77
Conscientiousness Reduction	2.44	2.93	1.71	2.91	-.52	2.4	-0.78	1.83
Openness Reduction	2.15	2.50	1.29	2.20	-.20	1.29	-0.11	1.71

Note. Independent t-tests were performed for warning vs. control message. All scales were significant at the $p < .01$ except for Fear (PANAS-X), which was significant at the $p < .05$.

The next sets of hypotheses were exploratory and based upon physiological data. The patterns of physiological responding proved much more intricate and variable than originally proposed. I will address the original hypotheses, but I will also expand upon them and attempt to explain the patterns that did emerge.

Table 3: *Change in physiological responses from baseline to manipulation*

	Control Non-faker	Control Faker	Warning Non-faker	Warning Faker
LF	-139.9	**-242.2***	79642.4	64494.4
VLF	**-349.1***	**-370***	9791.6	7137
HF	509.4[†]	159.7	104020.5	98915.3
VHF	24.3[†]	20.0	5600.7	-142.6
RSA	.02	0.17	**0.674***	0.964
BPM	**-2.7***	-3.3	**-3.5***	**-3.7***
PEP	-0.02	-0.01	-0.0005	-0.001
SC	-0.94	0.625	**18.06***	**34.35***

Note. †$p < .10$ *$p < .05$

The first exploratory hypothesis stated that heart rate and skin conductance should increase from baseline to the presentation of the warning message for both fakers and non-fakers. The results show that contrary to what was hypothesized, there was a significant decrease in heart rate for those in the warned group (fakers: $t(21)=2.15$, $p<.05$; non-fakers: $t(8)=2.72$, $p<.05$) as well as non-fakers in the control group ($t(13)=2.78$, $p<.05$). Fakers in the control condition also had a decrease in heart rate but it was not significant ($t(16)=1.48$, $p=.158$). Skin conductance responses (SCR) did increase significantly for both fakers and non-fakers in the warned group (fakers: $t(25)=-2.35$, $p<.05$; non-fakers: $t(15)=-2.63$, $p<.05$), with no significant difference for those in the control group as hypothesized. Therefore, exploratory hypothesis 1 received partial support.

Exploratory hypotheses 2-4 regarded the measurement of cardiac output. Due to an unforeseen issue regarding the necessity of the participant's height and weight for analysis, I was not able to analyze that measure specifically.

The final exploratory hypothesis regarded those in the control condition. It was proposed that those receiving the control message would have no change from baseline to manipulation for any measure of physiology. This hypothesis was not supported as there was a significant decrease in heart rate for control non-fakers ($t(13)=2.78$, $p<.05$) as well as mixed significant findings regarding heart rate variability which will be explored further below.

While I was unable to analyze cardiac output specifically, there were multiple other measures obtained that provide insight into the emotional reaction occurring at the moment of the warning message. These specifically were heart rate variability (HRV), respiratory sinus arrhythmia (RSA), and pre-ejection period (PEP). HRV is measured in terms of very low frequency (VLF), low frequency (LF), high frequency (HF), and very high frequency (VHF)

components. I examined the article previously cited, by Kreibig (2010), to see if any of the significant patterns of results found within each of my cells matched any of the emotional patterns summarized.

For warned fakers, there was significant decrease in heart rate ($t(21)=2.15$, $p<.05$), as well as a significant increase in SCRs ($t(25)=-2.35$, $p<.05$). This pattern was consistent with either fear when being presented with threatening material or anxiety in a threat-of-shock context (Kreibig, 2010). There was a decrease in PEP, which is consistent with fear, as well as an increase in LF, which is consistent with anxiety; however neither measure was significant so differentiation is not possible.

For those in the warned non-faker group, there was a significant decrease in heart rate ($t(8)=2.72$, $p<.05$), a significant increase in SCR ($t(15)=-2.63$, $p<.05$), and a significant increase in RSA ($t(14)=-1.83$, $p<.10$). While the heart rate and skin conductance suggest similar patterns to anxiety or fear, the significant increase in RSA is contrary to previous patterns of results for these emotions. They are, however, consistent with the pattern of a decrease in heart rate and an increase in RSA for anger when being shown a picture of angry expressions. A decrease in PEP, while not significant, further supports this pattern of autonomic responding for anger (Kreibig, 2010).

Those in the control faker group only showed a significant increase in LF ($t(20)=2.28$, $p<.05$) and VLF ($t(20)=4.187$, $p<.01$). According to Kreibig (2010), an increase in LF is only consistent for those experiencing anxiety. It is fairly widely accepted that HF and VHF are measures of parasympathetic activity, while LF and VLF have recently been contended as measures of sympathetic activity and are rather now thought to be influenced by both branches of the ANS (Billman, 2013). Without any other significant results, it is difficult to interpret what

emotions, if any occurred for this group. However, anxiety at being presented a pop-up message regardless of content makes intuitive sense.

Those in the control non-faker group had a significant decrease in heart rate ($t(13)=2.78$, $p<.05$), a significant increase in HF and VHF ($t(15)=-1.89$, $p<.10$; $t(15)=-1.94$, $p<.10$), and a significant decrease in VLF ($t(15)=2.44$, $p<.05$). This pattern of results does not correspond with any of the emotional response patterns suggested in the Kreibig (2010) article. It is, however, consistent with an overall decrease in sympathetic activity, and an increase in parasympathetic activity.

Discussion

The purpose of this study was to explore the underlying mechanisms behind why warning messages reduce faking through both self-reported emotions, as well as physiological reactions. It attempted to build upon the studies conducted by Fan et al. (2012) as well as Ellingson et al. (2012) by not only examining physiological reactions to warnings, but also the reactions from every cell in the proposed 2x2 design.

Ellingson et al. (2012) did not examine emotional reactions in their second study, which involved the summer internship deception, nor did they examine emotional reactions for every cell of their first study. This study expanded on their findings by combining both studies together and adding in a physiological component for a more rigorous design. This study no only contributes to the literature on the test/re-test procedure, but it answers a call from the Industrial and Organizational field to expand upon simple self-report and cross-sectional design.

Issues arose in regards to sample size that prevented many of the self-reported findings to be significant, however, the pattern of results overall were relatively consistent with what was hypothesized. Independent t-tests showed that those in the warning condition significantly reported higher levels of guilt, shame, anger, and fear than those in the control conditions suggesting that warning messages do evoke strong negative emotions.

It was found that those in the warned non-faker group did report higher levels of anger than the other cells, which was supported by significant physiological data consistent with being shown a picture of an angry expression. This supports the notion that those who are not fakers,

42

but are accused of being so, will react with hostility. Those in the warned faker group, self reported high levels on all negative emotions, but the largest for fear of punishment. The physiological responses of this group supported feelings of fear or anxiety. Lastly the control groups reported almost zero levels on any of the self-reported emotions measured, but showed significant increases in physiological responses consistent with the physiological pattern for anxiety.

One exception to what was originally hypothesized was that those in the warned non-faker group were higher in self-reported fear than those in the warned faker group. However, this result stemmed from the general PANAS-X measure, while the more straightforward, Fear of Punishment, scale was consistent with the hypothesized direction. The PANAS-X fear measure asks the participant to rate their emotions based upon very general words that are associated with fear such as timid or frightened. The Fear of Punishment scale relates these emotions directly to the mechanism attempting to be measured by asking questions related directly to score reduction stemming from fear.

Ellingson et al. (2012) found that state guilt moderated the relationship between warned fakers and score reduction. Similar to these findings, there was a higher level of self-reported guilt for those in the warned group, than those in the control group. However, the self-reported fear-of-punishment scale coupled with the physiological data suggests that those who were fakers experienced feelings of fear or anxiety at the moment of the warning message. Both the fear and anxiety patterns expressed were operationalized in terms of a threatening situation, suggesting that rather than simply fear or anxiety, what the participants may have been expressing physiologically was a reaction to threat overall. This reaction to threat is more closely aligned with the hypothesis that what fakers are expressing at the moment of the warning

message may be fear rather than guilt, as guilt does not tend to be the standard reaction when presented with a threat. However, without the measure of cardiac output or a larger sample size to reach significance for self-report data, it is difficult to say whether one emotion outweighs the other or that they are occurring at the same time.

If the emotion that warned fakers are feeling is fear, this can have implications for how warning messages are designed. Some organizations may not want to evoke fear in their applicants, as this can potentially make the position seem less desirable. This could have implications for designing the warning message to elicit guilt, or a sense of responsibility, as opposed to fear.

Consistent with what was hypothesized, non-fakers who were given the warning message self-reported feelings of anger, which were supported by the pattern of physiological responses. This included a significant increase in RSA, a result not found for any other group. This supports the notion that those who are falsely accused of faking, will react with feelings of hostility when confronted with an accusation. This could have similar implications to the warned fakers who feel fear. Organizations may be opposed to evoking anger amongst their applicants, especially considering these were the "honest" responders. Because the classification for fakers is relatively arbitrary, honest individuals could unintentionally be flagged as fakers and given a warning message. Their negative reaction of anger could affect their commitment to the organization and willingness to complete the application process over again in the re-test component.

Surprisingly, those in the control conditions did have significant results regarding their change in physiological state. The pattern of results, coupled with the self-reported emotions data, suggest that the individual's in these cell were simply reacting with anxiety at the sudden

and abrupt change in the survey. Their emotions surveys hardly rise above the baseline of no emotion at all, which is what was expected and suggests that the warning component does lead to meaningful emotional responses.

Limitations and Future Research Directions

All together these results support the predicted patterns of emotional responding for each cell of the study. However, there were a number of limitations that lessen the impact of these results. The first of these being that the sample size was too small to allow for any of the interaction effects to be significant. This design of the study lends to four cells in which n=27 was the highest sample that was able to be achieved excluding issues with missing data. In the future I plan to collect more participant data to better make conclusions regarding these results.

The second limitation involved the inability to analyze cardiac output. Many of my core hypotheses surrounded this measure, but I was unfortunately unable to analyze it due to not having the participant's height and weight. I plan to collect this data for any future participants. The addition of the cardiac output measure will give us much greater insight into what emotions are occurring at this time point.

A third limitation involved the deception component and the use of an undergraduate sample. While the deception component is designed to attempt to motivate the individuals in the study to make it as close as possible to a real-world selection situation, there is no guarantee that this technique was successful. Future research should test whether the emotional reactions among real-world applicants is similar to those in this study.

Another limitation of this study was that there is no baseline measure of personality to compare individual's results. There is no way to ensure that the reduction in scores corresponds

to honest responding. Participants could be over-compensating in their responses and inadvertently giving inaccurate responses in the second block of testing.

A final limitation is that these results only apply to the identification and consequences warning message, with a small reasoning component. Future research should examine the differences in emotional response when given various forms of a warning message. For example, an educational warning message may lead to different emotional reactions and even alleviate the reaction of anger from warned non-fakers.

Practical Implications

The results showed that a warning message significantly increases an individual's emotional response in anger, fear, guilt, shame, and score reduction. Practioners should be wary of the trade-offs between reducing faking and negative reactions on selection measures. The results did show that those who were warned non-fakers had a strong anger reaction when falsely accused. This unjust fairness perception could potentially lead to a loss of qualified candidates through negative views towards the organization, or even more serious, litigation for unfair selection practices. This is especially concerning as the distinction between faker versus non-faker is relatively arbitrary. A second implication is that the reactions of fear and guilt may cause some individuals to lower their scores well below their true score causing potentially qualified applicants to be removed from consideration. Caution is therefore warranted when implementing a mid-warning message in real-word selection practices.

References

Acharya, U. R., Joseph, K. P., Kannathal, N., Lim, C. M., & Suri, J. S. (2006). Heart rate variability: a review. *Medical and biological engineering and computing*, *44*(12), 1031-1051.

Allen, M. T., Fahrenberg, J., Kelsey, R. M., Lovallo, W. R., & Doornen, L. J. (1990). Methodological guidelines for impedance cardiography.*Psychophysiology*, *27*(1), 1-23.

Anderson, C. D., Warner, J. L., & Spencer, C. C. (1984). Inflation bias in self-assessment examinations: Implications for valid employee selection. *Journal of Applied Psychology*, *69*, 574-580.

Ax, A. F. (1953). The physiological differentiation between fear and anger in humans. *Psychosomatic Medicine*, *15*, 433-442.

Barrett, K. C. (1995). A functionalist approach to shame and guilt. In J. P. Tangney & K. W. Fischer (Eds.), *Self-conscious emotions: The psychology of shame, guilt, embarrassment, and pride*. (pp. 25–63). New York, NY: Guilford.

Barrett, L. F. (2006). Are emotions natural kinds?. *Perspectives on Psychological Science*, *1*, 28-58.

Barrett, L. F. (2012). Emotions are real. *Emotion*, *12*, 413.

Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel Psychology*, *44*, 1-26.

Barrick, M. R., & Mount, M. K. (1996). Effects of impression management and self-deception on the predictive validity of personality constructs. *Journal of Applied Psychology*, *81*, 261-272.

Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next?. *International Journal of Selection and Assessment*, *9*, 9-30.

Billman, G. E. (2013). The LF/HF ratio does not accurately measure cardiac sympatho-vagal balance. *Frontiers in physiology*, *4*.

Bing, M. N., Kluemper, D., Davison, H. H., Taylor, S., & Novicevic, M. (2011). Overclaiming as a measure of faking. *Organizational Behavior and Human Decision Processes, 116*, 148-162.

Bobko, P., Roth, P. L., & Potosky, D. (1999). Derivation and Implications of a Meta-Analytic Matrix Incorporating Cognitive Ability, Alternative Predictors, and Job Performance. *Personnel Psychology*, *52*, 561-589.

Bradley, M. M., & Lang, P. J. (2000). Emotion and motivation. *Handbook of Psychophysiology*, *2*, 602-642.

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: the self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*, 49-59.

Butcher, J. N., Morfitt, R. C., Rouse, S. V., & Holden, R. R. (1997). Reducing MMPI-2 defensiveness: The effect of specialized instructions on retest validity in a job applicant sample. *Journal of Personality Assessment*, *68*, 385-401.

Cannon, W. B. (1927). The James–Lange theory of emotions: A critical examination and an

      alternative theory. A*merican Journal of Psychology, 39*, 106–124.

Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The

      psychophysiology of emotion. *Handbook of Emotions*, *2*, 173-191.

Christiansen, N. D., Burns, G. N., & Montgomery, G. E. (2005). Reconsidering forced-choice

      item formats for applicant personality assessment. *Human Performance*, *18*, 267-307.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of

      psychopathology. *Journal of Consulting Psychology*, *24*, 349-354.

Donovan, J. J., Dwight, S. A., & Hurtz, G. M. (2003). An assessment of the prevalence, severity,

      and verifiability of entry-level test taker faking using the randomized response

      technique. *Human Performance*, *16*, 81-106.

Dullaghan, T. R. (2010). *The effect of a reasoning warning on faking in personality testing for*

      selection and the perception of procedural justice (Doctoral dissertation, University of

      South Florida).

Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion*, *6*, 169-200.

Ellingson, J. E., Heggestad, E. D., & Makarius, E. E. (2012). Personality retesting for managing

      intentional distortion. *Journal of Personality and Social Psychology*, *102*, 1063.

Ellingson, J. E., Sackett, P. R., & Hough, L. M. (1999). Social desirability corrections in

      personality measurement: Issues of test taker comparison and construct validity. *Journal*

      of Applied Psychology, *84*, 155.

Fan, J., Gao, D., Carroll, S. A., Lopez, F. J., Tian, T. S., & Meng, H. (2012). Testing the efficacy

      of a new procedure for reducing faking on personality tests within selection

      contexts. *Journal of Applied Psychology*, *97*, 866.

Fan, J., Zhao, G., Wang, M., Page, R. C., Meng, H., Yuan, Y. (2015). A Comprehensive

    Examination of a New Faking-Mitigation Procedure for Personality Tests within

    Selection Contexts: A Field Experiment. *SIOP Small Grant Proposal.*

Fowles, D. C., Christie, M. J., Edelberg, R., Grings, W. W., Lykken, D. T., & Venables, P. H.

    (1981). Publication recommendations for electrodermal

    measurements. *Psychophysiology*, *18*(3), 232-239.)

Funkenstein, D. H. (1955). The physiology of fear and anger. *Scientific American*.

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., &

    Gough, H. C. (2006). The International Personality Item Pool and the future of public-

    domain personality measures. *Journal of Research in Personality, 40*, 84-96.

Harder, D. H., & Zalma, A. (1990). Two promising shame and guilt scales: A construct validity

    comparison. *Journal of Personality Assessment, 55,*729–745.

Hough, L. M., & Oswald, F. L. (2008). Personality testing and industrial–organizational

    psychology: Reflections, progress, and prospects. *Industrial and Organizational*

    Psychology, *1*, 272-290.

James, W. (1884). What is an emotion? *Mind*, 9, 188-205.

Kemper, T. D. (1987). How many emotions are there? Wedding the social and the autonomic

    components. *American Journal of Sociology*, 263-289.

Khalfa, S., Isabelle, P., Jean-Pierre, B., & Manon, R. (2002). Event-related skin conductance

    responses to musical emotions in humans. *Neuroscience letters*,*328*(2), 145-149.

Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: A review. *Biological*

    Psychology, *84*, 394-421.

Landers, R. N., Sackett, P. R., & Tuzinski, K. A. (2011). Retesting after initial failure, coaching

    rumors, and warnings against faking in online personality measures for selection. *Journal*

    of Applied Psychology, *96*, 202.

Lewis, M. (2000). Self-conscious emotions: Embarrassment, pride, shame, and guilt. In M.

    Lewis & J. M. Haviland-Jones (Eds.), *Handbook of Emotions*. (pp. 623–636). New York,

    NY: Guilford Press.

Newlin, D. B., & Levenson, R. W. (1979). Pre-ejection Period: Measuring Beta-adrenergic

    Influences Upon the Heart. *Psychophysiology*, *16*(6), 546-552.

Overbeek, T. J., van Boxtel, A., & Westerink, J. H. (2012). Respiratory sinus arrhythmia

    responses to induced emotional states: effects of RSA indices, emotion induction method,

    age, and sex. *Biological psychology*, *91*(1), 128-141.

Pace, V. L., & Borman, W. C. (2006). The use of warning to discourage faking on noncognitive

    inventories. *A closer examination of test taker faking behavior*, 283-304.

Paulhus, D. L. (1984). Two-component models of socially desirable responding. *Journal of*

    Personality and Social Psychology, *46*, 598-609.

Paulhus, D. L. (1988). Balanced inventory of desirable responding (BIDR). *Acceptance and*

    Commitment Therapy. Measures Package, *41*.

Paulhus, D. L. (1998). Paulhus deception scales (PDS): *The Balanced Inventory of Desirable*

    Responding – 7 user's manual. North Tonawanda, NY: Multi-Health System.

Paulhus, D. L., Harms, P. D., Bruce, M. N., & Lysy, D. C. (2003). The over-claiming technique:

    measuring self-enhancement independent of ability. *Journal of Personality and Social*

    Psychology, *84*, 890-904.

Reyes del Paso, G. A., Langewitz, W., Mulder, L. J., Roon, A., & Duschek, S. (2013). The utility of low frequency heart rate variability as an index of sympathetic cardiac tone: a review with emphasis on a reanalysis of previous studies. *Psychophysiology*, *50*(5), 477-487.

Schachter, S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, *69*, 379.

Tangney, J. P. (1990). Assessing individual differences in proneness to shame and guilt: development of the Self-Conscious Affect and Attribution Inventory. *Journal of Personality and Social Psychology*, *59*, 102.

Tangney, J. P. (1999). The self-conscious emotions: Shame, guilt, embarrassment, and pride. In T. Dalgliesh & M. J. Power (Eds.), *Handbook of Cognition and Emotion*. (pp. 541–568). Chichester, England: Wiley.

Viswesvaran, C., & Ones, D. S. (1999). Meta-analyses of fakability estimates: Implications for personality measurement. *Educational and Psychological Measurement*, *59*, 197-210.

Watson, J. (1924). Behaviorism. New York: People's Institute.

Watson, D., & Clark, L. A. (1999). The PANAS-X: Manual for the positive and negative affect schedule-expanded form.

Yuan, Y., Bing M., Hou N., Zheng L., Hack E., Davison H.K., Vance C., & Kluemper D. (2015, April). *A Laboratory Investigation of Validities of Four Faking Measures*. Paper presented at the annual meeting of The Society for Industrial and Organizational Psychology, Philadelphia, PA.

Warning and Control Messages from Previous Research

Butler (1997)

Because of test defensiveness, your first test results were not valid. In taking psychological tests in employment settings, some people are concerned about certain things. For example, some people wonder how honest they have been in responding to the items. The MMPI-2 contains several measures that were constructed to allow the interpreter to evaluate test-taking attitudes. For example, people who give an overly virtuous picture of themselves, or try to appear more psychologically disturbed than they actually are, are easily detected. Thus, their test protocols are invalid and cannot be used in the evaluation.

It is also important to realize that this inventory was developed as a way of measuring individual personality traits, not just to detect if a person has serious psychological problems. We all know that every person is different, that is, has a different personality, and that they are better suited to certain things because of this.

This test helps a psychologist understand what an individual's personality is like, and, by this enables him or her to advise and help in a more efficient manner.

Some of the statements on the inventory may seem unrelated to anything about your personality and other items may seem overly personal. A word then, about how these items were chosen:

A large list of statements was given to a group of normal people and to people experiencing different kinds of psychological problems. Then, the statements that were answered with different frequency by the two groups were selected as a scale. It has been shown that people who have different kinds of personality structures will answer these items in similar ways. So the important thing to remember is that test interpretation does not involve reading your specific responses. Scoring the test involves simply computing the responses for each personality scale and comparing individual scores with various known groups.

We hope that you will answer all the items unless they really do not apply to you. Most people are able to respond to all the items. The MMPI-2 is made up of many statements; you are to decide whether the statements are mostly true or mostly false, and then fill in the appropriate spot on your answer sheet.

Fan et al. (2012)

Warning

Thank you for participating in this portion of the selection process. However, we have noticed some unusual response patterns in your answers and wish to clarify the issue. The personality inventory and the school activity survey, which you are completing, have two embedded social desirability scales. These scales identify people who might have tailored their responses to what

they believe the hiring organization wants to hear, in order to increase the chances of getting the job. Your response profile up to this point is similar to that of someone who is known to be answering in a socially desirable way. We do not intend to insult your integrity; we only want to get a clear understanding of who you are. Inaccurate information from the assessment, if used as the basis for selection, may result in poor person-job fit and/or poor person-organization fit. This may further lead to unfit employees feeling inadequate, dissatisfied, having decreased motivation and eventually quitting; or being terminated by the organization. Thus, we would like to underscore the importance of total honesty in completing these inventories.

That said, we would like to offer you an opportunity to complete the inventories all over again. Remember, be yourself and answer each question as it best describes you. Finally, rest assured that your previous responses on these inventories will NOT be considered in our final selection decisions. However, we have found in the past that some candidates had repeatedly distorted their response. These individuals were quickly discovered and were immediately removed from the selection process.

Control

Thank you for participating in this portion of the selection process. A random system check indicates the testing system is working well. Please continue the test. Be reminded that as part of the testing procedure, some of the items will be presented twice. So don't be surprised if you see some of the items showing up again on the screen.

Ellingson et al. (2012)

Deception

It is very important that you pay attention to these instructions. We will use your scores on this next measure to select people to perform a special task in the second session of this study. In selecting people for this task, we are interested in choosing people who have the following characteristics: hardworking, detail-oriented, and reliable; sociable and able to work well with others; and able to tolerate stress.

In the next session, if your scores on the measure qualify you to work on the task, we will enter you into a drawing to win a cash prize of $50 as a reward for your effort. If your scores do not qualify you, we will ask you to fill out a couple of questionnaires, and then we'll dismiss you. It is important to us that we make good choices with respect to whom we select to participate in this task, so please be honest when you answer the questions on this questionnaire.

Warning

We are sorry, but your data have been identified as invalid. The questionnaire that you completed had a series of statements designed to detect when a person has described himself or herself in an overly positive manner. Responses that are overly positive often suggest that the individual is not answering the questions honestly. Your responses to those statements were overly positive and indicated that you may not have responded in an honest manner.

As we emphasized to you in the last session, it is important to our research that we make good choices with respect to whom we select to participate in the special task. That is why we ask that all participants provide honest and accurate answers to questions. As it stands right now, because your responses are suspect, we cannot use your data in our research.

Because getting accurate responses from you is important to us, and because the success of our research project is at stake, we have decided to give you a second chance. You have the opportunity to complete the questionnaire again; you can still be eligible for the special task and the $50 drawing. We have set the computer system so that it will score your test immediately after you finish.

Appendix B

Measures for Current Study

IPIP-50

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Indicate for each statement whether it is 1. Very Inaccurate, 2. Moderately Inaccurate, 3. Neither Accurate Nor Inaccurate, 4. Moderately Accurate, or 5. Very Accurate as a description of you.

	Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate	
1. Am the life of the party.	O	O	O	O	O	(1+)
2. Feel little concern for others.	O	O	O	O	O	(2-)
3. Am always prepared.	O	O	O	O	O	(3+)
4. Get stressed out easily.	O	O	O	O	O	(4-)
5. Have a rich vocabulary.	O	O	O	O	O	(5+)
6. Don't talk a lot.	O	O	O	O	O	(1-)
7. Am interested in people.	O	O	O	O	O	(2+)
8. Leave my belongings around.	O	O	O	O	O	(3-)
9. Am relaxed most of the time.	O	O	O	O	O	(4+)
10. Have difficulty understanding abstract ideas.	O	O	O	O	O	(5-)
11. Feel comfortable around people.	O	O	O	O	O	(1+)
12. Insult people.	O	O	O	O	O	(2-)
13. Pay attention to details.	O	O	O	O	O	(3+)
14. Worry about things.	O	O	O	O	O	(4-)
15. Have a vivid imagination.	O	O	O	O	O	(5+)
16. Keep in the background.	O	O	O	O	O	(1-)
17. Sympathize with others' feelings.	O	O	O	O	O	(2+)
18. Make a mess of things.	O	O	O	O	O	(3-)
19. Seldom feel blue.	O	O	O	O	O	(4+)

20. Am not interested in abstract ideas.	O	O	O	O	O	(5-)
21. Start conversations.	O	O	O	O	O	(1+)
22. Am not interested in other people's problems.	O	O	O	O	O	(2-)
23. Get chores done right away.	O	O	O	O	O	(3+)
24. Am easily disturbed.	O	O	O	O	O	(4-)
25. Have excellent ideas.	O	O	O	O	O	(5+)
26. Have little to say.	O	O	O	O	O	(1-)
27. Have a soft heart.	O	O	O	O	O	(2+)
28. Often forget to put things back in their proper place.	O	O	O	O	O	(3-)
29. Get upset easily.	O	O	O	O	O	(4-)
30. Do not have a good imagination.	O	O	O	O	O	(5-)
31. Talk to a lot of different people at parties.	O	O	O	O	O	(1+)
32. Am not really interested in others.	O	O	O	O	O	(2-)
33. Like order.	O	O	O	O	O	(3+)
34. Change my mood a lot.	O	O	O	O	O	(4-)
35. Am quick to understand things.	O	O	O	O	O	(5+)
36. Don't like to draw attention to myself.	O	O	O	O	O	(1-)
37. Take time out for others.	O	O	O	O	O	(2+)
38. Shirk my duties.	O	O	O	O	O	(3-)
39. Have frequent mood swings.	O	O	O	O	O	(4-)
40. Use difficult words.	O	O	O	O	O	(5+)
41. Don't mind being the center of attention.	O	O	O	O	O	(1+)
42. Feel others' emotions.	O	O	O	O	O	(2+)
43. Follow a schedule.	O	O	O	O	O	(3+)
44. Get irritated easily.	O	O	O	O	O	(4-)
45. Spend time reflecting on things.	O	O	O	O	O	(5+)
46. Am quiet around strangers.	O	O	O	O	O	(1-)
47. Make people feel at ease.	O	O	O	O	O	(2+)
48. Am exacting in my work.	O	O	O	O	O	(3+)
49. Often feel blue.	O	O	O	O	O	(4-)
50. Am full of ideas.	O	O	O	O	O	(5+)

Note. These five scales were developed to measure the Big-Five factor markers reported in the

following article: Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment, 4,* 26-42.
They are <u>not</u> the IPIP scales developed to measure the five NEO-PI-R domains.
The numbers in parentheses after each item indicate the scale on which that item is scored (i.e., of the five factors: (1) Extraversion, (2) Agreeableness, (3) Conscientiousness, (4) Emotional Stability, or (5) Intellect/Imagination) and its direction of scoring (+ or -). These numbers should not be included in the actual survey questionnaire.

Bogus Statement Scale

Task Experience Survey
Instructions: Listed below are a series of tasks related to clerical work, computer programming and use, research skills, and interpersonal relationships, most of which you will perform at the position at InSat Corporation's Summer Internship Program. Please indicate how frequently you have done each task during the last 12 months, using the following scale.
(A) Never
(B) A couple of times
(C) Quite a number of times
(D) Often

1. **Use statistical overture functions in Excel.**
2. Operate a fax machine.
3. Arrange/set up tables for banquets and events.
4. Operate a coping machine.
5. **Organize files using the FolderPro Filing Scheme.**
6. Type at least 70 wpm on a QWERTY keyboard.
7. Plan and host a group meeting.
8. **Use Johnson's Dyadic Approach of avoiding conflict in work teams.**
9. Manage databases using Microsoft Access.
10. **Writing memo using ProworkNotes on iPhone/iPad.**
11. Format a professional paper using the APA format.
12. Create a presentation using Microsoft PowerPoint.
13. Use HURIER skills to present ideas to coworkers or clients.
14. Edit digital photographs using Adobe Photoshop.
15. **Writing emails using Emerson's business format.**
16. Video chat with friends using an iPad.
17. **Create slideshow using Picslide program.**
18. Book flights on the Internet.
19. Set up a multi-party online chat with Skype.
20. Create charts and tables using Microsoft Excel.

21. Setting up a teleconference meeting using MeetPoint.

22. Use the Outlook online calendar.

23. Utilize the Web of Science to locate published research articles.

24. **Operate a Nephogram projector**.

25. Use the "foot-in-the-door" technique to persuade potential buyers.

Impression Management and Self-deceptive Enhancement Scale

	Reverse Scored	Factor
1. I am sometimes irritated by people who ask favors of me.	X	IM
2. I sometimes try to get even, rather than forgive and forget.	X	IM
3. I never regret my decisions.		SDE
4. I am always courteous, even to people who are disagreeable.		IM
5. Sometimes at elections I vote for candidates I know little about.	X	IM
6. I worry quite a bit over possible misfortunes.	X	SDE
7. Life is a strain for me most of the time.	X	SDE
8. I have not always been honest with myself.	X	SDE
9. In a group of people I have trouble thinking of the right things to talk about.	X	SDE
10. I rarely appreciate criticism.	X	SDE
11. People often disappoint me.	X	SDE
12. When I take sick-leave from work or school, I am always as sick as I say I am.		IM
13. I always apologize to others for my mistakes.		IM
14. Once in a while I laugh at a dirty joke.	X	IM
15. I have several times given up doing something because I thought too little of my ability.	X	SDE
16. I have thought of committing suicide in order to get back at someone.	X	SDE
17. I have sometimes thought that my parents hated me.	X	SDE
18. I always tell the truth.		IM
19. There have been occasions when I have taken advantage of someone.	X	IM
20. I have never dropped litter on the street.		IM

PFQ2 Guilt and Shame Scale Harder (1990)

Embarrassed	G
Mild guilt	S
Feeling ridiculous	S
Worry about hurting or injuring someone	G
Self-consciousness	S
Felling humiliated	S
Intense guilt	G
Feeling "stupid"'	S
Regret	G
Feeling "childish"	S
Feeling helpless, paralyzed	S
Feelings of blushing	S
Feeling you deserve criticism for what you did	G
Feeling laughable	S
Feeling disgusting to others	S
Remorse	G

PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate <u>to what extent you felt this way during the test interruption</u>. Use the following scale to record your answers:

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremel

cheerful	sad	active	angry at self
disgusted	calm	guilty	enthusiastic
attentive	afraid	joyful	downhearted
bashful	tired	nervous	sheepish
sluggish	amazed	lonely	distressed
daring	shaky	sleepy	blameworthy
surprised	happy	excited	determined
strong	timid	hostile	frightened
scornful	alone	proud	astonished
relaxed	alert	jittery	interested
irritable	upset	lively	loathing
delighted	angry	ashamed	confident
inspired	bold	at ease	energetic
fearless	blue	scared	concentrating
disgusted with self	shy	drowsy	dissatisfied with self

Manipulation Check

We would like your honest opinion about the deception procedure of this study. Your responses will not influence your SONA credit or your chances in the drawing in any way.

1. To what extent did you believe that Dr. Fan is collaborating with Insat Cooperation to gathering data?
    a. I did not care
    b. I did not believed in it
    c. I was skeptical
    d. Somewhat believed
    e. I believed it

2. How convinced were you about that the job opportunity offered to you was real?
    a. I did not care
    b. I did not believed in it
    c. I was skeptical
    d. Somewhat believed
    e. I believed it

Fear of Punishment Scale

Instructions: The following statements describe how you felt during the psychological test. Please indicate the extent to which you agree or disagree with each statement using the following scale.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. The system message I received in the middle of the test made me very concerned about possibly failing the psychological test.
2. After receiving the system message in the middle of the test, I felt I had to change my response patterns in order pass the psychological test.
3. I felt that if I had continued my response patterns after receiving the system message in the middle of the test, I would have failed the psychological test.
4. The system message I received in the middle of the test did not affect my subsequent response pattern during the rest of the psychological test. (R)
5. The system message I received in the middle of the test did not worry me. (R)

Experimental Scripts

Warning Message

Warning   Warning   Warning   Warning

Thank you for participating in this portion of the selection process for InSat corporation's summer internship program. However, we have noticed some *unusual response patterns* in your answers and wish to clarify the issue. The personality inventory, which you are completing, has embedded social desirability scales. These scales identify people who might have tailored their responses to what they believe the hiring organization wants to hear, in order to increase the chances of getting the internship.

Your response profile up to this point is similar to that of someone who is known to be answering in a socially desirable way. We do not intend to insult your integrity; we only want to get a clear understanding of who you are. Inaccurate information from the assessment, if used as the basis for selection, may result in poor person-job fit and/or poor person-organization fit. This may further lead to unfit interns feeling inadequate, dissatisfied, having decreased motivation and eventually quitting; or being terminated by the organization. Thus, we would like to underscore the importance of total honesty in completing these inventories.

That said, we would like to offer you an opportunity to complete the inventories all over again. Remember, be yourself and answer each question as it best describes you. Finally, rest assured that your previous responses on these inventories will NOT be considered in our final selection decisions. However, we have found in the past that some candidates had repeatedly distorted their response. These individuals were quickly discovered and were immediately removed from the selection process

Control Message

Thank you for participating in this portion of the selection process. A random system check indicates the testing system is working well. Please continue the test. Be reminded that as part of the testing procedure, some of the items will be presented twice. So don't be surprised if you see some of the items showing up again on the screen.

Diversion Task Script

In a moment, I'm going to ask you to complete a survey. The questions in the survey will present you with information commonly found on a resume. You will be asked to judge how that content represents specific attributes including abilities, work style characteristics, and cross functional skills.

Each page of the survey asks you to do the same thing, but for different resume content. The resume content of interest will appear in **bold face** type in each question. It takes about 10 minutes to complete this part. Now, you may open the survey link on your computer screen and start working on this task.

Focal task script

Experimenter:

The second part of today is related to Dr. Jinyan Fan's research project, and he has come to the lab to introduce the research project to you.

Dr. Fan:

Hello, I am Dr. Fan. Thanks for coming to my lab and completing the first part of the study, which is my research. For the second part, you are going to do something completely different, which doesn't involve me research. I am helping a friend of mine, who is a CEO for a company called InSat Corporation. They are developing a pre-screening assessment for recruiting and selecting college students into their paid internship program. In this program you can make up to $15 per hour and about $4,000-$5,000 per semester. The majority of the work involved is basically clerical. Your tasks could include working with Microsoft office software, sending emails, organizing files and taking memos for meetings. However, you will also get opportunities to participate in more in depth work, such as selling ideas to clients, working in a team to come up business plans, and conducting basic level data analysis.

InSat needs a collection of college students to answer the questions to help with development. We have agreed to help them gather the data needed. This pre-screening assessment consists of a personality inventory, a basic skills survey, and a general knowledge survey. It takes about 45 minutes to complete. Based on this pilot test, InSat will revise and finalize the pre-screening assessment. They plan to start a large-scale campus recruitment

63

campaign in the Spring semester of 2015 at several major universities in the Southeast U.S. This of course includes Auburn University.

When the CEO of InSat approached me for help, I told him that we have this wonderful SONA system through which we will be able to get enough college students to pilot-test their pre-screening assessment. However, I also asked him if they could offer something to our students in exchange for their assistance. They came up with two benefits to offer. First, InSat has agreed to sponsor the drawing for two $50 cash rewards. We will do the drawing at the end of the summer, and there will be 2 lucky participants who will each receive $50 in cash from InSat.

The second benefit is that the CEO realized that InSat's campus recruitment would cover Auburn University. He realized that maybe some of the participants would be interested in the paid internship program. Therefore InSat is giving you the opportunity to indicate that you are interested in the internship program by checking the "Yes" box at the end of the assessment. If you do so they will review your answers more carefully, and if you perform well on the assessment, they would be happy to give you early consideration for the internship program. Basically, they are looking for someone that is hardworking, detail-oriented, thoughtful, efficient, and reliable. However, no need to feel pressured. That is, taking the test does not necessarily mean that you are required to attend the internship. InSat has written up an introduction to their paid internship program and you can find more details about it on the first page of the survey.

So, now I'm going to have you complete the pre-screening assessment that InSat is developing. Please take your time and respond carefully.

Debriefing Script

Thanks very much for your participation in this study. But I have to disappoint you—we are actually not working with InSat Corporation. InSat Corporation is actually not existent. I apologize for the deception and the disappointment you might have.

But let me explain—the deception condition was created for research purposes. The aim of this study is to examine faking under an application condition. As you know, applicants tend to enhance themselves and respond in a more socially desirable way when applying for a job, a phenomenon called "social desirability" or "faking." There is some evidence that faking may render the selection questionnaires invalid. We want to study faking, and one thing we have to do is to simulate an application situation, under which applicants are likely to engage in faking when completing the pre-employment assessment. In order to simulate an application situation, we pretended to be offering a potential job opportunity that you might have been interested in. Participants are randomly assigned to receive a control message or a warning message indicating that faking was detected. This is regardless of whether faking was actually taking place. We will compare the responses of the warned subjects against the unwarned subjects or the control group. As you may notice, the first task you did (the resume analysis task), is a diversion task which is not related to the research purpose. The research is supported by Dr. Fan's (my advisor) research fund and the drawing for the 50$ cash reward is real. We have two $50 cash rewards to give out to participants including students in this condition and in the control condition. We will do the drawing by the end of this semester. Each participant will get an equal chance to win the cash rewards.

Given that this study involves a deception, you have the choice of not allowing us to use your data in further analysis. If you choose this option, please notify the experimenter now. In this case, you will still receive 2 hours of SONA credit and be entered into the cash drawing. The odds of winning the cash prize are at least 1:80. If you feel upset by the deception, you are more than welcome to have a follow-up with either Dr. Fan or a counselor.

An important note: Since the data collection is currently under way and we have more participants coming in to do the study during the rest of the semester, we ask that you not share the study details (particularly the deception part) with other students even if they will not participate in this study. This way the integrity of the study will be protected. Thank you.