Stop what you’re doing, right now! Effects of interactive messages on careless responding

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STOP WHAT YOU’RE DOING, RIGHT NOW! EFFECTS OF INTERACTIVE MESSAGES ON CARELESS RESPONDING

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

By

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2019
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I HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER MY SUPERVISION BY Anthony Gibson ENTITLED Stop what you’re doing, right now! Effects of interactive messages on careless responding, BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Doctor of Philosophy.

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ABSTRACT

Gibson, Anthony. Ph.D., Department of Psychology, Human Factors, Industrial, Organizational Psychology Ph.D. program, Wright State University, 2019. Stop what you’re doing, right now! Effects of interactive messages on careless responding.

Careless responding (CR) can negatively affect the quality of self-report data and thus the resulting conclusions researchers draw from the data. The purpose of the current study was to investigate whether interactive warnings, which alert careless respondents in real time, reduce CR more than traditional, non-interactive warnings. I used a 4 x 4 mixed factorial design to examine these relationships. The between group factor was the type of warning used, which consisted of four levels (i.e., a control, no warning group, a traditional, non-interactive warning, an interactive threatening warning message, and an interactive encouraging message), and the within person factor consisted of CR measurements across four questionnaire sections. The results showed that the interactive consequence message failed to reduce CR scores compared to a traditional warning message. Implications for these findings include the general ineffectiveness of techniques based on motivational theories to deter CR. Future research should continue investigating different CR prevention techniques.
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I. INTRODUCTION

Researchers using self-report questionnaires must rely on respondents to put forth reasonable effort; otherwise, data quality may suffer and invalidate researchers’ conclusions (see Maniaci & Rogge, 2014). To address this problem, researchers have implemented techniques including (a) detecting careless responding and removing the suspected cases (Huang, Curran, Keeney, Poposki, & DeShon, 2012) and (b) preventing careless responding (e.g., using warning messages describing consequences for carelessness; Huang et al., 2012). These techniques are applied either before the study begins or after data collection is finished. Previous research has shown these techniques to be somewhat successful in detecting and deterring careless responding (see Huang et al., 2012; Meade & Craig, 2012). Typical non-interactive warning techniques, however, are problematic for three reasons: (a) they fail to demonstrate researchers’ ability to successfully detect careless responding, (b) they are independent of respondent behavior, and (c) they include harsh wording that may result in negative participant reactions.

Interactive, encouraging messages may improve the current warning message implementation by addressing these issues. Unlike typical non-interactive warnings, researchers can program interactive messages to present on respondents’ screen if the participant displays a certain response pattern (see Fan, Gao, Carroll, Lopez, Tian, & Meng, 2012). In the current context, a participant who displays a pattern consistent with carelessness (e.g., providing identical responses across many consecutive items) would experience an alert presented on their screen. Encouraging message content may also reduce the likelihood that respondents perceive the study negatively. Before describing
the potential benefits of interactive messages, I describe careless responding more generally in the following section.

**Introduction to Careless Responding**

Research has shown that about 10 to 12% of participants fail to display adequate attention when completing online, self-report surveys (Meade & Craig, 2012). This behavior has been described in the literature using various terms including “careless responding” (Meade & Craig, 2012), “insufficient effort responding” (Huang et al., 2012), and “participant inattention” (Maniaci & Rogge, 2014). I use the term careless responding in the current paper. Careless responding (CR) refers to a response set in which respondents answer questionnaire items with “. . . low or little motivation to comply with survey instructions, correctly interpret item content, and provide accurate responses” (Huang et al., 2012, p. 100). As I discuss below, CR is one of several response biases that negatively affect the validity of conclusions drawn from studies using self-report data.

**Careless Responding as Response Bias**

McGrath, Mitchell, Kim, and Hough (2010) identified careless, or inconsistent, responding as one of several response biases that can be present in self-report data. In general, response bias occurs when respondents repeatedly provide inaccurate responses to self-report questions, which can result in increased random measurement error. McGrath et al. identified two different classes of response biases: One class in which the respondents disregard item content (e.g., inconsistent responding, acquiescence) and a second class in which respondents alter their responses based explicitly on item content (e.g., positive impression management; negative impression management). Typically,
respondents adopt the latter response strategy in an effort to intentionally shape others’ perceptions of them.

Although respondents adopting different response biases can produce identical responses, the intent with which people engage in these different behaviors can vary. For example, positive impression management (PIM)—the tendency for certain respondents to neglect reporting abnormal personal qualities—reflects an effortful process to present oneself positively (McGrath et al., 2010). Participants engaging in this type of behavior must be aware of item content to depict certain impressions. In contrast, careless or inconsistent responding reflects a lack of respondent effort. Careless respondents, for example, may choose to bypass reading the questionnaire items, which is distinct from presenting oneself in a particular manner. Although prior research has focused on detecting cases reflecting the various response biases (Berry et al., 1992; Wayne & Ferris, 1990), I focus on CR in the current paper. Researchers have made great strides in implementing ways to detect CR in the last few decades (Beach, 1989; DeSimone, Harms, & DeSimone, 2015; Huang et al., 2012; Meade & Craig, 2012). The following sections focus on two approaches to addressing the problem of CR: (a) detection/data omission and (b) prevention.

**Detecting Careless Responding**

Researchers have directed considerable attention toward detecting CR (Huang et al., 2012; Meade & Craig, 2012). Typically, CR detection methods belong to one of two categories. Post-hoc indices are detection methods used after data collection is finished (e.g., long string, psychometric synonyms; Meade & Craig, 2012); a-priori methods, on the other hand, include carelessness indicators embedded into the questionnaire (e.g.,
instructed response items; Meade & Craig, 2012). A benefit of post-hoc methods is that they can be implemented using most any existing dataset. Researchers have identified various post-hoc indices to detect highly inconsistent responses (e.g., psychometric/semantic synonyms, psychometric/semantic antonyms, and even-odd consistency), invariable responses (e.g., long string; pattern long-string), and multivariate outliers (e.g., Mahalanobis Distance; see Curran, 2016; DeSimone et al., 2015).

In contrast to the post hoc methods, a-priori indices are embedded into the questionnaire to detect various forms of CR including the endorsement highly improbable items (e.g., infrequency or bogus items), suspiciously fast response times (e.g., page time; survey completion time), and self-reported carelessness (e.g., self-reported diligence; Curran, 2016; Meade & Craig, 2012). A drawback of these a-priori techniques is that they require preplanning; thus, they cannot be used on existing datasets without the indices embedded.

The most effective CR index depends on the nature of the carelessness pattern adopted. For example, Meade and Craig (2012) found that the long string index was the best method to detect nonrandom, consecutive responding, whereas Mahalanobis D was acceptable when carelessness followed a random uniform distribution. Because respondents across a single dataset may adopt different carelessness patterns, researchers have recommended using multiple indices to detect CR (Huang et al., 2012; Meade & Craig, 2012). Meade and Craig, for example, suggested that researchers should embed instructional response items into the survey, as well as run both an inconsistency index and a multivariate outlier index. The additional effort to detect CR accurately is necessary; prior research has shown that detecting and removing careless responding
cases can improve estimates of model fit (Huang et al., 2012), measures of internal consistency (Huang et al., 2012), and statistical power (Maniaci & Rogge, 2014).

Because researchers must use multiple indices to detect different CR response patterns (see description above), I used several indices to detect CR in the current study. The a-priori indices I included were an infrequency index (Huang, Bowling, Liu & Li, 2015; Maniaci & Rogge, 2014; Meade & Craig, 2012), a semantic synonyms index (Maniaci & Rogge, 2014), and a completion time index (Gibson & Bowling, 2019; Huang et al., 2012). The post-hoc detection methods I computed were the multivariate outlier analysis Mahalanobis D (Meade & Craig, 2012), the long string index (Huang et al., 2012; Meade & Craig, 2012) and the even-odd consistency index (Curran, 2016; Meade & Craig, 2012). I describe the indices separately in the subsections below.

**Infrequency index.** Infrequency items are designed to have a correct answer that should be selected by any careful respondent (e.g., “I can teleport across time and space”; Meade & Craig, 2012). Researchers assume that any respondent who endorses multiple infrequency items is thus responding carelessly. Typically, infrequency item responses are recoded into a dichotomous variable representing either careful (i.e., 0) or careless (i.e., 1; e.g., Meade & Craig, 2012) responses.

**Inconsistency indices.** Inconsistency indices measure the degree to which respondents provide inconsistent responses across strongly correlated items (Huang et al., 2012; Maniaci & Rogge, 2014; Meade & Craig, 2012). A-priori, semantic inconsistency items involve embedding items that have similar content into the questionnaire (Maniaci & Rogge, 2014), whereas post-hoc, psychometric inconsistency indices consider any item pairs, independent of item content, that are strongly correlated (Meade & Craig, 2012).
Psychometric inconsistency indices can include item pairs with either strong positive (i.e., psychometric synonyms) or negative (psychometric antonyms) correlations. In the current study, I used a semantic inconsistency index.

**Completion time index.** Completion time indices measure the amount of time participants spend completing the study questionnaire (Huang et al., 2012). I compute the page time index, which refers to the amount of time participants spend on each questionnaire page. The underlying rationale behind the completion time measure is that participants must engage in several mental processes while answering questionnaire items, which each requires time to complete (see Krosnick, 1991; Tourangeau, 1984). Although researchers have not determined the exact amount of time required to answer different questionnaire items, researchers have conventionally used a two second per item cutoff (Bowling et al., 2016; Chiaburu, Huang, Hutchins, & Gardner, 2014; Huang et al., 2012). Based on this cutoff, researchers recode page time submissions below the established cutoff to one (i.e., careless, which is coded as “1”) and submission times above the cutoff as zero (i.e., careful, which is coded as “0”).

**Long string index.** The long string index computes the number of consecutive identical responses reported on each questionnaire page (Meade & Craig, 2012; Huang et al., 2012). Meade and Craig separated this index into average long string (i.e., the respondent’s average long string values across all questionnaire pages) and maximum long string (i.e., respondents’ largest long string value across all questionnaire pages). Because the two long string types are typically strongly correlated (see Gibson & Bowling, 2019), I used the average long string.
**Mahalanobis distance.** Researchers have recently begun using a multivariate outlier index to detect careless responding. Mahalanobis distance identifies aberrant response patterns across multiple variables (see Curran [2016] for a detailed description). Typically, researchers have computed a Mahalanobis distance score for each study variable and averaged the scores across those variables (e.g., Bowling et al., 2016). Large Mahalanobis D scores indicate a high probability of CR.

In sum, researchers have created methods to detect careless behaviors including providing several highly improbable responses (e.g., the infrequency index), displaying unusually fast response times (e.g., completion time index), and providing highly inconsistent responses (e.g., even-odd consistency). These indices have expanded both the available data screening techniques and the understanding of carelessness patterns. Rather than focusing on ways to detect carelessness, researchers have begun examining proactive techniques to deter CR.

**Deterring Careless Responding**

Researchers have devoted less attention to deterring CR responding than to detecting it. Deterring CR, however, provides benefits over detecting careless respondents and removing suspected cases. Researchers who remove careless respondents are deleting data and thus wasting the resources required for data collection (e.g., time, money). Some on-line survey platforms (e.g., Amazon’s Mechanical Turk) even pay respondents for questionnaire completion. Removing participants also reduces statistical power (Cohen, 1992), which reduces the likelihood that researchers observe significant differences that are present in the population.
Additionally, prior research has found that CR correlates with self-reported (Maniaci & Rogge, 2014) and other-reported (Bowling, Huang, Bragg, Khazon, Liu, & Blackmore, 2016) personality traits. Deleting suspected careless cases might remove a particular subset of the sample, potentially biasing conclusions drawn from the data (see Ward & Pond, 2015). Preventing careless responding provides practical and theoretical benefits above detecting and then removing suspected cases. In the following subsection, I describe methods researchers have used to prevent CR.

Previously, researchers have implemented several techniques to reduce the incidence of CR including (a) warning messages (Gibson & Bowling, 2019; Huang et al., 2012; Meade & Craig, 2012), (b) removing anonymity from questionnaire responses (Meade & Craig, 2012), and (c) combing warnings with a virtual avatar (Ward & Pond, 2015). Because researchers have found that warnings reduce CR (see Gibson & Bowling, 2019; Huang et al., 2012) and perform comparably to other techniques (e.g., removing anonymity; Meade & Craig, 2012), I focus on warning messages in the current study. The underlying rationale for the effectiveness of warning messages in the research has been scant. In order to address this omission, I use social power theory (see French, 1956; French & Raven, 1959; Raven, 1992) to describe why warning messages reduce CR.

**Social Power Theory and Warning Messages**

Social power theory seeks to explain why a person adheres to the orders of any particular agent (see French, 1956; Raven, 1993; Elias, 2008). I refer to the person who exerts power as the “agent,” whereas I refer to the one receiving such order as the “target.” In an early description, French and Raven (1959) identified five social power
bases: (a) reward power, (b) coercive power, (c) legitimate power, (d) referent power, and (e) expert power. Raven (1965) extended the model to include informational power, in which the agent explains why the target should comply with the agent’s request. Researchers have more recently expanded the model further to include 14 power bases (see Raven, 1992, 1993). Because the expanded model has been described thoroughly elsewhere (see Elias, 2007; Raven Schwarzwald, & Koslowsky, 1998), I will focus on power strategies most relevant to the current topic: using interactive messages to encourage people to respond carefully.

In general, university settings provide a context for researchers to exert power on students (Elias, 2007; Elias & Mace, 2005). Specifically, researchers have the ability to use power techniques to ensure student compliance. For example, researchers are responsible typically for granting students research credits. Thus, participants depend on the researcher to award their credits, which often fulfill course requirements (Peterson, 2001). Second, researchers are typically in positions within the university that demonstrate objective power distances over undergraduates. Students likely perceive this power distance and should thus be more likely to accept the role of target. Accordingly, students have rated several power strategies as acceptable in university settings (see Elias, 2007). Because researchers are able to exert power strategies to ensure compliance, social power theory explains why power strategies (e.g., messages to reduce CR) should enforce compliance in questionnaire research. In the following subsections, I describe those social power strategies that correspond directly to using messages to prevent CR in questionnaire studies.
**Impersonal coercive power.** Coercive power refers to a target’s perception that he or she will be punished for non-compliance (French & Raven, 1959), which can be further separated into personal or impersonal (Elias, 2007; Raven, 1992). Impersonal coercive power involves threatening negative consequences or valences for noncompliance, rather than the threat of social rejection. CR researchers have used coercive power by warning that careless respondents will receive some negative punishment (e.g., the threatened removal of participation credits; Huang et al., 2012). Note that the consequences here are in the form of negative valences, which indicates an impersonal strategy.

**Legitimate dependence power.** Legitimate power refers to a perceived obligation that the target should or “ought to” follow the agent’s orders (French & Raven, 1959). More specifically, an agent using legitimate dependent power would state that he or she needs the target’s compliance in order to complete the task successfully (Elias, 2007). Careless responding warning messages have stated that remaining attentive is “vital” (Gibson & Bowling, 2019) or “important” (Meade & Craig, 2012) to the study. Thus, researchers have communicated that they are reliant on the respondent to conduct a successful study.

**Positive expert power.** Expert power refers to influence gained when the target perceives that the agent has expertise in a particular area (see French & Raven, 1959). Note that expert power can be either positive or negative (Raven, 1992, 1993). Positive expert power implies that the agent is not using his or her influence to potentially harm the target. In the context of careless responding, researchers have stated that they have included advanced detection methods to detect CR accurately (Gibson & Bowling, 2019;
Huang et al., 2012; Huang et al., 2015). This should increase a respondent’s perception that he or she should comply with the request because the researcher is an expert.

**Direct information power.** Direct information power refers to an agent using a logical argument to obtain compliance (Elias, 2007; Raven, 1992, 1993). CR warning messages have stated that CR would result in wasted time and effort put forth by researchers and participants alike (see Gibson & Bowling, 2019). This content presents a clear argument for the importance of responding carefully to the survey, which should increase perceived power. I discuss below how including these power base characteristics has resulted in reduced CR scores in applied research.

**Empirical evidence from CR literature.** French (1956) argued that the extent to which an agent can obtain compliance is proportional to the magnitude of all power bases used combined. In the context of questionnaire completion, warnings that include multiple power bases should thus reduce CR more than manipulations that include fewer bases. Accordingly, researchers have included the social power techniques mentioned above in warning messages to deter careless responding successfully (Huang et al., 2012; Meade & Craig, 2012). For example, Huang et al. found that a warning message that stated CR detection methods were present and that carelessness would be punished reduced CR for three of four CR indices compared to a control group.

Meade and Craig (2012) embedded a warning message stating that CR dishonored the school’s ethical guidelines. This warning content corresponds to the position legitimate power base only (i.e., the target should follow the agent due to moral obligations; see Elias, 2007), which should reduce the power exerted compared to a message that uses multiple power bases. Indeed, Meade and Craig found that this
warning significantly reduced CR for one index only compared to a control group and performed similarly to an identified only condition.

In summary, although prior research has suggested that the current warnings are somewhat beneficial (e.g., Huang et al., 2012), these messages have limitations that can be addressed. Indeed, current warnings have failed to reduce CR across all indices computed (Huang et al., 2012; Meade & Craig, 2012), have provided no benefit above an identified only condition (Meade & Craig, 2012), and have required the combination of additional techniques (e.g., an avatar observer; Ward & Pond, 2015). Thus, researchers may be able to reduce CR further by improving typical non-interactive warning messages. In the section below, I discuss the shortcomings of the current warning manipulations and suggest methods for improvement.

**Improving Current Warning Manipulations**

The underlying purpose of using warning messages is to use a researcher’s power to gain participant compliance to put forth effort in the study (i.e., social power; see French, 1956; French & Raven, 1959; Raven, 1992). Note that the degree to which these warning messages reduce CR is dependent on the degree they include social power bases. In the following subsections, I describe limitations of existing warning messages in the context of social power theory and methods to improve warning messages.

**Shortcomings of current warning message implementations.** Warning messages currently have drawbacks that limit their ability to reduce CR. First, researchers have placed warning messages at the beginning of the questionnaire (e.g., Huang et al., 2012). This practice may result in two problematic effects. First, the warning message may not remain salient to respondents throughout the entire
questionnaire. This may be particularly true when participants complete lengthy surveys, which would be problematic because long surveys are common across different psychology subfields (see Gibson & Bowling, 2019). According to social power theory, the degree to which coercive power influences behavior is based on the perceived negative valence of the punishment multiplied by the perceived likelihood that the respondent could avoid the punishment (Raven, 1959). Note that the participant must perform this mental calculation continually throughout the study. If the questionnaire were lengthy, participants would likely become increasingly bored or tired throughout the duration of the study, which may reduce participants’ motivation to avoid the threat of revoked participation credits. Thus, the magnitude of the perceived negative valence would likely diminish and reduce the power magnitude of the warning. Stated simply, as participants complete a lengthy, tedious questionnaire, the motivation to end participation may supersede the desire to avoid revoked research credits.

Second, warnings placed at the beginning of a questionnaire are not contingent on actual participant behavior (e.g., Meade & Craig, 2012). In the social power context, respondents should perceive warning messages based on actual behavior as more credible and be more likely to comply with the message. Raven (1959) described coercive power as a dependent behavioral change, which is based on the agent’s perceived ability to observe conformity. If the respondent perceives that the agent (i.e., researcher) is blind to whether conformity occurs, the power magnitude should decrease. In accordance with these predictions, Luckenbill (1982) found that people were more compliant to coercive messages when they perceived the source as capable to deliver that threat. Researchers
adopting interactive messages would directly demonstrate the ability to detect unwanted behavior and communicate this to the target in real time.

On a practical note, researchers have not determined the manner in which careful participants perceive warning messages. Meade and Craig (2012) noted that only approximately 10-12% of respondents from a student sample provide careless responses, whereas Maniaci and Rogge (2014) found this estimate to be as low as 3 to 9%. Thus, when researchers use the current warning implementation, at least 90% of respondents in any given sample might be threatened unnecessarily. This practice may offend trustworthy respondents, which would likely undermine the experimenter-participant relationship. Specifically, coercive power often reduces the perceived attractiveness of the agent (Raven, 1959; Raven et al., 1998). Thus, needlessly warning otherwise careful participants may introduce unneeded aversion into the study. In a slightly different domain, De Dreu, Giebels, and Van de Vilert (1998) found a moderate, negative relationship between threats and trust. An interactive warning based on participants’ careless responses would avoid unnecessarily threatening careful participants and potentially damaging the respondent-researcher relationship.

**Improving warnings using interactive messages.** Researchers may be able to improve participant compliance to respond carefully via an interactive warning message. Interactive warnings provide concrete evidence that respondent responses are being monitored. Because impersonal coercive power leads to dependent social change (i.e., compliance is dependent on the agent sustaining the relationship; Coch & French, 1948; Raven, 1959) and leads to behavioral changes without necessarily causing private cognitive changes (Raven & French, 1958), sustained surveillance is needed to ensure
continued compliance. Interactive warnings are capable of monitoring the respondents’ respondents across the entire experiment—an improvement on typical non-interactive warnings. This enhanced surveillance should result in lower incidence of CR. Note that Meade and Craig (2012) found that participants whose responses were identified engaged in less CR than those who completed the survey anonymously. The addition of a monitoring system appears to increase respondents’ obligation to perform well, which aligns with the finding that a monitoring avatar paired with a warning message reduced CR (Ward & Pond, 2015). Thus, participant behavior appears to change when respondents perceive that the researcher is monitoring their actions.

Sustained researcher-participant interaction via interactive messages should also increase a respondent’s obligation to perform well and thus reduce CR. In fact, Meade and Craig (2012) suggested that increased social contact might reduce carelessness. In a typical non-interactive warning message scenario, the researcher terminates the interaction after the initial warning. Thus, the respondent interacts minimally with the researcher during questionnaire completion. This lack of social interaction likely reduces participant accountability and increases CR (Meade & Craig, 2012). An interactive message, however, should result in the researcher communicating to the participant throughout the experiment (i.e., if the participant triggers the message). By sustaining the participant-researcher interaction, interactive warnings should increase social contact and deter careless responding more than the typical non-interactive warnings.

In demonstrating expert power, interactive warnings provide evidence that the researcher can determine whether the respondent is conforming and when any lack of compliance occurs. This demonstrated expertise should be perceived as more credible,
thus increasing perceived social power. In fact, in order for expert power to influence behavior, the target must believe both that the agent is knowledgeable, and that the agent is truthful (French & Raven, 1959). An interactive warning would demonstrate that the agent could identify when the respondent has stopped complying and communicate this detection immediately.

Finally, interactive warnings should capture participant attention that wanes across specific portions of the survey. Meade and Craig (2012) noted that respondents rarely engage in CR throughout the entire survey but instead lose attention temporarily and then return to responding carefully. Typical non-interactive warning messages have been unable to identify specific time points in which attention began to wane and prompt the warning accordingly. Given the improvements of interactive warnings compared to typical non-interactive warning messages, I expect that those respondents assigned to an interactive warning should have a lower incidence of CR compared to those assigned to a control condition or to a typical non-interactive warning condition.

**Hypothesis 1a:** Participants assigned to the interactive warning message will have lower incidence of CR compared to participants assigned to control condition.

**Hypothesis 1b:** Participants assigned to an interactive warning message will have lower incidence of CR compared to a typical non-interactive warning condition.

In addition to investigating between-group differences in CR, it is also important that researchers study CR at the within-person level of analysis. Most CR researchers have studied CR using between-group comparisons (e.g., Huang et al., 2012; Meade & Craig, 2012; Ward & Pond, 2015). For example, Huang et al. found that the incidence of CR was lower for participants who received a warning message compared to participants
who received typical questionnaire instructions. Because effects at one level of analysis do not necessarily occur at other levels of analysis (Chen, Bliese, & Mathieu, 2005; Robinson, 1950), researchers should measure CR at the within-person level. Interactive messages provide a method to study CR across multiple levels of analysis.

Although not tested in the CR context, researchers in the faking literature have shown that interactive warnings produce within-person reductions in faking scores (Fan et al., 2012; Landers, Sackett, & Tuzinski, 2011). For example, Fan et al. found that respondents who were identified as faking and received a warning message had lower scores on a second attempt, which provided indirect evidence that the interactive warning reduced faking scores. Similarly, Landers et al. (2011) identified extreme responders (i.e., marking only 1s and 5s) and sent those respondents an “interactive” warning that stated their responses deviated from a pattern indicating attentive responding. The interactive warning decreased both the percent of respondents who engaged in extreme responding after the warning appeared for both internal and external employees. Thus, interactive warning messages appear to reduce within-person faking scores.

Although social power theory has focused mainly on between-group effects (e.g., Pierro, Cicero, & Raven, 2008), the principles of social power theory suggest that an interactive warning should increase social power magnitude over time. First, impersonal coercive power should increase with the researcher demonstrating the ability to monitor the participant (see Elias, 2007), and increased power magnitude should relate to CR. The magnitude of expert power should also increase over time, with the researcher indicating that he has the expertise to ensure continued compliance. This should increase compliance and thus reduce CR scores. An interactive warning serves as a medium in
which to embed direct information power by highlighting that careful responding is important for the study. Finally, the interactive warning affects only participants who need to be influenced most (i.e., careless responders), perhaps increasing the utility of the message. Thus, I expect that an interactive message will result in increased compliance in the form of careful responding.

**Hypothesis 2:** Participants who trigger the interactive message should display reduced within-person CR scores following the message.

To reiterate, interactive warning messages should leverage the researcher’s ability to ensure compliance to the request to complete the questionnaire carefully. Thus, interactive warning messages should result in both between and within person reductions in CR. A remaining question refers to the use of impersonal coercive messages to exercise social power. Specifically, given the negative reactions to harsh social power techniques (see Elias, 2007), I discuss the appropriateness of using impersonal coercive power in warning messages below.

**Content of Interactive Warning Messages**

**Respondent reactions.** Typical non-interactive CR warning messages include harsh wording that may negatively affect respondent reactions toward questionnaire research. For example, CR researchers have stated that carelessness would lead to a participant losing his or her participation credits (e.g., Huang et al., 2012). Because most research participants engage in research in exchange for mandatory course credits (Peterson, 2001), I expect this type of threat is particularly worrisome for participants. Thus, the negative valence of this warning content likely leads to strong negative
reactions. Below I discuss how social power theory provides a rationale for why harshly worded messages may result in negative respondent reactions.

Social power researchers have distinguished between soft and harsh power strategies (Elias, 2007; Koslowsky, Schwarzwald, & Ashuri, 2001; Pierro, et al., 2008; Raven, Schwarzwald, & Koslowsky, 1998). Furthermore, factor analyses results have supported the existence of the two underlying factors (i.e., soft and harsh techniques; Elias & Mace, 2005; Raven et al., 1998). Generally, these strategies refer to the target’s perceived latitude in choosing to comply. Harsh, or hard, power bases refer to power methods in which the target perceives little freedom in choosing to comply (e.g., impersonal coercion, personal coercion), whereas soft power techniques refer to methods in which the target perceives much freedom in choosing to comply (e.g., expert, referent power; Koslowsky et al., 2001). Power messages in general, and warning messages specifically, can reflect either harsh or soft power bases.

Most CR researchers have adopted harsh power methods in their warning messages, with impersonal coercion being particularly common (e.g., Gibson & Bowling, 2019; Huang et al., 2012). Although prior research has shown that these threatening warnings reduce the incidence of CR (e.g., Huang et al., 2012), other studies have shown that harsh warnings provide no significant improvement in reducing CR above identification methods (Meade & Craig, 2012). In addition to mixed findings in the effectiveness of harsh warnings, careless responding researchers have largely ignored the effects of these harsh warnings on respondent reactions.

In the context of social power theory, however, participants have reported more favorable reactions to soft power techniques compared to harsh power techniques (Elias,
2007). The rationale for these findings being that targets of harsh power techniques likely experience resistance, due to harsh power techniques leading to feelings of exclusion and reduced self-esteem (Kearney & Plax, 1992). These negative attitudes should result in targets preferring soft power strategies. Accordingly, soft power techniques have related positively to perceptions of appropriateness from students (Elias, 2007; Roach, 1994) and job satisfaction from employees (Koslowsky, Schwarzwald, & Ashuri, 2001). Soft power techniques are most effective when the objective power distance was small (see Koslowsky et al., 2001; Schwarzwald, Koslowsky, & Ochana-Levin, 2004), which is the case in the questionnaire research. In contrast, the use of harsh power strategies correlated negatively with education satisfaction, teacher satisfaction, and learning (Jamieson & Thomas, 1974). Based on the negative effects of harsh power strategies on participant satisfaction (Elias, 2007; Kindsvatter, 1990; Koslowsky et al., 2001) and the specific negative effects of threatening warnings on respondent reactions (e.g., increased test anxiety; Burns, Fillipowski, Morris, & Shoda, 2015), I expect that an encouraging interactive message that uses soft power strategies would result in more positive fairness perceptions and higher satisfaction levels compared to an interactive warning message.

**Hypothesis 3a**: Participants assigned to an encouraging interactive warning will report more positive perceptions of fairness than participants assigned to the interactive punishment warning condition.

**Hypothesis 3b**: Participants assigned to an encouraging interactive warning will report higher levels of study satisfaction than participants assigned to the punishment condition.
Reducing careless responding. Interactive messages that use soft power strategies (e.g., expert power, direct informational power; Elias, 2007; Raven 1992, 1993) are rare in questionnaire research. Questionnaire completion, however, provides ample opportunity to include these features. For example, researchers using encouraging interactive messages can exert legitimate dependent power (i.e., stating respondent attention is needed in order to conduct a successful study), positive expert power (i.e., stating the agent is an expert who can diagnose behavior harmful to a successful study), and direct informational power (i.e., stating researchers and participants have dedicated time and effort to the study; see Elias, 2007 for a summary of the power techniques).

In contrast, common questionnaire instructions lack any power strategy techniques. Given that target compliance is based on the total magnitude of different power strategies used (see French, 1956), encouraging interactive warning messages should result in increased social power exerted, and thus reduced CR, compared to a typical questionnaire research design that lacks power techniques. Thus, I expect that participants assigned to an interactive encouraging message will engage in less CR than participants provided typical (control) questionnaire instructions. Additionally, given the benefits of interactive messages above typical non-interactive warning instructions described above, I expect that respondents provided an interactive encouraging message will display lower CR scores than those assigned to a traditional non-interactive warning.

Hypothesis 4a: Participants assigned to an encouraging interactive warning will engage in less CR than participants assigned to a control group.
**Hypothesis 4b:** Participants assigned to an encouraging interactive warning will engage in less CR than participants assigned to a traditional non-interactive warning.

The comparison between punitive and encouraging interactive messages is equivocal compared to the expected relationship between interactive encouraging messages and typical survey instructions. Soft power messages, however, might reduce CR more successfully than messages that contain harsh content. Soft power strategies, namely expert, information, and legitimate power, have resulted in increased incidence of compliance compared to harsh power strategies (Aguinis, Nesler, Quigley, Lee, & Tedeschi, 1996; Elias, 2007; Elias & Loomis, 2004). Elias and Loomis, for example, found that informational and expert power led to the highest self-rated compliance from university students. Note that the agents in this study were professors rather than researchers. Thus, the extent to which these findings generalize to CR using researchers as agents is unknown, which restricts the predictions that can be made currently. The presence of interactive warnings might also cause typically careful respondents to deliberate more than usual in their responses. Increased deliberation might negatively affect the validity of self-report measures (see Kung, Kwok, & Brown, 2017). However, note that Kung et al. found that the presence of attention check items had no significant effects on the validity of an OCB scale. Thus, the effects of interactive messages on respondent deliberation and response quality is unknown currently.

Finally, finding significant differences between warning and encouraging messages would be difficult due to low statistical power. Specifically, both messages should apply social power principles and thus reduce CR compared to a control condition.
Given the low base rates of CR (Meade & Craig, 2012), the effect sizes for between-group manipulations are typically small (e.g., Gibson & Bowling, 2019; Ward & Meade, 2018). Smaller effect sizes would reduce power and thus make finding significant differences between the two interactive messages difficult. Given the theoretical and statistical limitations described above, I propose the relationship between interactive message content and CR as a research question.

**Research Question 1:** Will participants assigned to an encouraging interactive message engage in less CR than participants assigned to a punitive interactive message?
II. METHOD

Participants

Introductory psychology students ($N = 405$) completed the questionnaire to fulfill a course research participation requirement. I conducted a power analysis to determine the total sample size to detect a small to medium effect ($f = .15$) for a mixed factor design. I used the effect size obtained in prior research that adopted a typical non-interactive warning manipulation (Gibson & Bowling, 2019) as a conservative estimate for the effect size of the interactive warning message. I set the power for this analysis at .80. When I entered the four groups for the between group variable (i.e., warning instructions) and the four measurements for the repeated measures variable (i.e., time), the power analysis determined I needed 352 participants total. Because I had no prior evidence of the effect size of interactive messages on CR, I rounded this number to a sample size of approximately 400. The mean age of participants was 20 years ($SD = 4$ years). 30 percent were male.

Design

I used a $4 \times 4$ mixed factor design, with the between-person warning instructions independent variable having four levels and the within-person variable having four measurements. I randomly assigned participants to one of four warning instructions conditions: (a) a control group with no warning instructions, (b) an experimental group that received typical non-interactive
warning instructions, (c) an experimental group that received an interactive punitive warning message, and (d) an experimental group that received an interactive encouraging feedback message.

I collected four levels for the within-person factor of questionnaire section. The questionnaire contained a total of 500 items. I divided the questionnaire into four sections with each section containing 125 items. Thus, I measured each person’s level of CR within each section. The CR rates across the different indices served as the repeated measurements.

**Criteria for interactive messages.** I used two CR indices as the criteria for prompting the interactive messages: (a) the infrequency index and (b) the long string index. I selected these indices to represent two of the three latent CR factors identified by Meade and Craig (2012). Meade and Craig identified the third latent factor as self-reported carelessness, and respondents completed these items after completing the main survey. Because this third factor refers to self-reported CR after questionnaire completion and thus is irrelevant to triggering an interactive message, I included only indices representing the first two factors mentioned.

I wrote a JavaScript code to implement the interactive message given the criteria described below. I used ‘while’ loops to program the long string index and ‘if, then’ statements to code the infrequency index criteria. The interactive message appeared as an alert in the center of the respondents’ screen. The alert based on the long string index presented when the participant submitted that particular questionnaire page, whereas the alert based on the infrequency index
presented at the end of the particular questionnaire quarter. I ensured the alert was presented at the most proximal time after the unwanted behavior. Participants had to click the alert box in order to return to the questionnaire.

Because there are no established cutoff scores for the different CR indices (see Curran, 2016), I used conservative cutoff scores of the infrequency index and the long string index to trip the interactive warnings. I embedded three infrequency items in each questionnaire quarter. Respondents tripped the interactive warning if they missed two out of three infrequency items in one questionnaire quarter or three out of the six infrequency items in a questionnaire half. Although prior research has not established cutoff scores for interactive warning messages, I assumed that respondents flagging two infrequency items in a 125-item span were careless. Those participants who missed one infrequency item might have interpreted the item differently than intended, so I required respondents to miss two infrequency items. Respondents also tripped the interactive warning message if they have a long string greater than ten on any questionnaire page containing 25 items. I used the averaged long string suggested by Costa and McCrae (2008) as the cutoff score (the specific cutoff scores for five response options ranging from *strongly disagree* to *strongly agree* were six, nine, 10, 14, and nine, respectively). Below I discuss the manipulated warning message conditions.

**Manipulations**

**Warning message manipulation.** I randomly assigned participants to one of four warning type messages. Participants in the control group received typical
questionnaire instructions. These instructions were taken from the IPIP and stated, “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.” The full instructions are shown in Appendix A. Participants assigned to the typical non-interactive warning condition encountered a warning message immediately before reaching the questionnaire items. The message content was adopted from Huang et al. (2012) and stated, “It is vital to our study that participants devote their full attention to this questionnaire. Otherwise, years of effort (the researchers' time and the time of other participants) could be wasted. Please be aware that I will use sophisticated statistical control methods to detect the accuracy and thoughtfulness of your responses. If you do not provide accurate and thoughtful responses to today’s survey, you will not receive course credit for completing the survey.” The full instructions for the typical non-interactive warning message are shown in Appendix B. Note that this warning message has been used in a prior study (Gibson & Bowling, 2019).

Participants assigned to the interactive warning message received a similar message compared to the typical non-interactive warning message manipulation but only received the message if they triggered the message. The interactive warning message content was adopted from both typical non-interactive CR warning messages and prior interactive warning messages in the faking literature (Fan et al., 2012; Landers et al., 2011). The interactive warning stated the following: “Based on your response patterns thus far, your response profile is similar to that of someone who is putting forth little effort into this questionnaire. It is vital to this study that you devote your full attention to
this questionnaire. Otherwise, years of effort (the researchers' time and the time of other participants) would be wasted. I have embedded sophisticated statistical control methods in this survey to detect the accuracy and thoughtfulness of your responses, and you have been identified as someone providing inaccurate responses. If you continue to provide inaccurate responses to this survey, you will not receive course credit for completing the survey.” The full instructions for the interactive, punitive warning message are shown in Appendix C.

Finally, participants assigned to the encouraging interactive warning flagged by the CR indices received a message that stated the researchers detected a pattern consistent with carelessness, identified the reason why putting forth effort is important, and urged them to be careful on the rest of the questionnaire items. The specific content of the interactive warning was, “Based on your response pattern thus far, your response profile is similar to that of someone who is putting forth little effort on this survey. It is vital to this study that you devote your full attention to this questionnaire. Otherwise, years of effort (the researchers’ time and the time of other participants) would be wasted. I have embedded sophisticated statistical control methods to detect the accuracy and thoughtfulness of your responses, and you have been identified as someone providing inaccurate responses. Given that I am reliant on you to provide accurate responses in order to run a successful study, I ask that you please put forth your utmost attention on the remaining items.” The full instructions for the interactive, encouraging message are shown in Appendix D.

Measures
**International Personality Item Pool (IPIP) items.** I included 466 personality items from the IPIP (Goldberg, 1999; see Appendix E). Participants rated these items on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An example personality item was “I try to lead others.” These items served as a medium in which to embed the a-priori CR indices. I was not directly interested in personality in this study.

**Study satisfaction.** In order to measure participant satisfaction, I included three items measuring study enjoyment from Croteau, Dyer, and Miguel (2010), an adapted item from Regehr et al. (2010), five adapted items from Lewis (1995), and an adapted item from Fogerson (2005). The ten items, which described respondents’ overall perceived study satisfaction, are shown in Appendix E. An example item from Regehr et al. was, “Generally, I was satisfied with today’s study.” Respondents answered these items on a sliding scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). I used a sliding scale with the hope that careless respondents would direct increased attention to a new response scale. I observed a Cronbach’s alpha value of .95 for the study satisfaction scale.

**Fairness items.** I used four items to measure perceived fairness (see Long and Christian, 2015; see Appendix E). An example item was “Overall, I was treated fairly in this experiment.” Participants rated this score on a sliding scale ranging from 1-5. I computed a scale score by computing the average rating across the four responses. I observed a Cronbach’s alpha value of .82 for the perceived fairness scale.

**A-priori CR indices.** Among the a-priori CR indices, I used only the infrequency index to program the interactive messages (see above for detailed
description of the programming procedures). Thus, I used the semantic synonyms and completion time indices as criteria to test both my hypotheses and my research question. Because I used the infrequency index to program the interactive message, I omitted this index as a criterion.

**Infrequency index.** I embedded 12 infrequency items (Beach, 1989; Huang et al., 2012; Maniaci & Rogge, 2014; Meade & Craig, 2012) throughout the questionnaire (see Appendix E). I selected inconspicuous infrequency items to minimize the amount of attention drawn to these items. An example infrequency item was “I have been to every country in the world.” I distributed the infrequency items throughout the questionnaire in a pseudo-random fashion to ensure the infrequency items were spaced adequately apart. On average, 40 personality items were between each adjacent infrequency item.

Respondents answered the infrequency items on a five-point rating scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). I recoded the infrequency scores into a dichotomous variable, such that there were two correct responses. For example, for the infrequency item “I have been to every country in the world,” the responses *strongly disagree* and *disagree* would be coded as correct (i.e., 0) and any other responses would be coded as careless (i.e., 1). I summed the recoded values to compute the overall infrequency score. The maximum possible infrequency score was 12. Larger values corresponded to greater likelihood of carelessness.

**Semantic Synonyms.** Semantic synonyms consist of nearly identically worded item pairs that are embedded across different questionnaire sections. Careful responders
should reply consistently across items within a pair. I embedded five items pairs from the inconsistency subscale of the Attentive Responding scale (ARS; Maniaci & Rogge, 2014) on each half of the questionnaire (see Appendix E). This resulted in 10 pairs (i.e., 20 items) total. I embedded the items within a pair on separate quarters of the same questionnaire half. This allowed for the comparison of semantic synonym scores across questionnaire halves. An example item pair was “I am an active person” and “I have an active lifestyle.” Respondents rated these items on a five-point rating scale ranging from 1 (strongly disagree) to 5 (strongly agree). Because each comparison contained only five item pairs, I scored the items by computing the absolute value of response differences of each item pairs; I assumed that five pairs were insufficient to compute reliable within-person correlations. I summed the response differences across all item pairs for each questionnaire half. Larger values indicated higher probability of CR.

**Completion time index.** I embedded timing questions into Qualtrics that tracked the amount of time respondents spent on each questionnaire page. Because respondents must engage in mental processing when answering questionnaire items (Krosnick, 1991; Tourangeau, 1984), I assumed that exceptionally fast completion times represented a high probability of CR. Based on techniques of prior researchers (see Bowling et al., 2016; Chiaburu, Huang, Hutchins, & Gardner, 2014; Huang et al., 2012), I adopted a two second per item cutoff score. I included 25 items on each questionnaire page, so the page time cutoff criterion was 50 seconds. Thus, I recoded completion time scores above 50 seconds as careful (i.e., 0) and scores below 50 seconds as careless (i.e., 1). I summed respondent scores across all questionnaire pages to compute a scale completion time score, with larger scores reflecting more CR.
Post-hoc CR indices. I computed two post-hoc CR indices to test my hypotheses to complement the a-priori indices. I computed the multivariate outlier index and the psychometric antonym index. Note that I used the long string index to trip the interactive warning (see description above) and thus excluded this index as a criterion variable. Below I describe these two indices.

Psychometric Antonyms. Psychometric antonyms involve empirically identifying item pairs with strong, negative correlations (see Curran, 2016 for a detailed description). In order to compute the index, researchers first create two vectors, with one item per pair entered into each vector. Then, the within-person correlation is computed across the two vectors. Curran described that observed positive values for the psychometric antonyms index denotes a high probability of carelessness. In general, positive values indicate high probability of careless responding.

Mahalanobis Distance. Mahalanobis distance, a multivariate outlier analysis, is a relatively new method to identify careless responders (see Curran, 2016; Meade & Craig, 2012). The main assumption for Mahalanobis D is that careless responders should have different response patterns compared to careful responders across multiple factors within the questionnaire. Stated simply, this index identifies whether a respondent is an outlier of the multivariate distribution created by all items. Large Mahalanobis distance scores indicate greater likelihood of CR.

Manipulation check items
**Social power manipulation check items.** I adapted six items from Nesler, Aguinis, Quigley, Lee, and Tedeschi (1999) to measure the participants’ perceived use of social power (see Appendix E). A sample item was “The researcher influenced me to work hard during the study.” Participants used a sliding rating scale ranging from 1-5. I computed the average score for each person for the scale score. For the current study, the Cronbach’s alpha estimate was .88.

**Warning message.** Respondents answered four items that served as manipulation checks for both the typical non-interactive and interactive messages. The first item stated, “The researcher told me that it was important that I provide accurate and thoughtful responses to today’s survey questions.” The second item stated, “The researcher told me that sophisticated statistical control methods were used to detect the accuracy and thoughtfulness of my responses to today’s survey questions.” The third item stated, “The researcher told me that I would lose my research participation credits if I failed to provide accurate and thoughtful responses to today’s survey questions.” The fourth item stated, “I received an Internet pop-up window that stated my response patterns were similar to someone not putting forth their full effort into the survey.” The first two items were taken from Gibson and Bowling (2019), whereas I created the latter two items for this study specifically. Respondents answered these items on a sliding scale ranging from 1 (strongly disagree) to 5 (strongly agree).
**Demographics.** I included three demographic items. Those included age, gender, and native language. Respondents could refuse to respond to any of the demographic item.
III. RESULTS

Preliminary Analyses

Data cleaning. I examined the data for missing values and outliers. Missing values on the infrequency scales were coded as non-CR (Maniaci & Rogge, 2014; Meade & Craig, 2012). I examined the data for skewness and kurtosis. The distributions for the average page time index displayed positive skew and positive kurtosis. Thus, I transformed scores on the page time variables using a log transformation (see Tabachnick & Fidell, 2007). I reported the results of the long string index using the log-transformed data.

Convergent validity of CR scales. The descriptive statistics and correlations for the CR indices are shown in Table 1, and the descriptive statistics and correlations of the CR indices across the four questionnaire segments are shown in Table 2. Overall, the CR indices showed modest levels of convergence (absolute value of correlations ranged from .01 to .48, with a mean of .18). The highest convergence was between the infrequency index and the page time index, which parallels previous research findings (e.g., Gibson & Bowling, 2019). Because some item pairs in the semantic synonyms and semantic antonyms indices were weakly related, I used only the psychometric synonyms index. Unfortunately, I identified insufficient number of pairs to include the psychometric antonyms. Thus, the results below omitted the semantic synonyms,
semantic antonyms, and psychometric antonyms indices but included the psychometric synonyms index.

**Incidence of careless responding.** In order to compare the current incidence of CR to other studies, I calculated the percent of respondents who answered carelessly throughout the entire survey. In order to obtain cutoff values across the specific indices, I followed the guidance described in Curran (2016). Specifically, respondents were identified as careless if they answered three or more infrequency items incorrectly or completed three or more survey pages suspiciously fast (i.e., faster than 50 seconds). I identified participants as careless if they had a long string value larger than 15 on at least one survey page. Finally, participants were identified as careless if they showed (a) an overall Mahalanobis D value larger than three standard deviations above the mean, (b) a positive value for the overall psychometric synonyms index, or (c) a positive value for the overall even-odd consistency index. Overall, I found that 15.6% of the participants were identified as careless, which is slightly larger than the 10 to 12% incidence noted by Meade and Craig (2012). Thus, I observed similar incidence of CR than other CR studies.

**Manipulation Check Analyses**

**Consequence message manipulation.** The first manipulation check item stated, “The researcher told me he will use advance statistical techniques to detect the accuracy and thoughtfulness of my responses to today’s survey questions.” This message was relevant to participants assigned to the traditional warning message and the careless participants assigned to either interactive consequence message conditions. These
participants were more likely to endorse the first manipulation check item \((M = 3.83, SD = 1.33)\) compared to participants assigned to the control condition and careful participants in the interactive warning conditions \((M = 2.73, SD = 1.33)\), \(t(249) = 7.69, p < .01, d = 0.83\). The consequence message was effective in communicating to participants that the accuracy of participants’ responses was being monitored.

The second incentive manipulation check item stated, “The researcher told me that I will lose my research credits if I fail to provide accurate and thoughtful responses to today's survey questions.” Participants assigned to traditional warning message or those who triggered the interactive warning message \((M = 4.19, SD = 1.25)\) were more likely to endorse this manipulation check item than were participants who weren’t shown this message \((M = 2.60, SD = 1.48)\), \(t(249) = 10.92, p < .01, d = 1.10\). The consequence message was effective in communicating to participants the consequences of responding carelessly.

The third consequence message manipulation check item stated, “The researcher told me that it was important that I provide accurate and thoughtful responses to today’s survey questions.” This message was relevant to participants assigned to the traditional warning condition and careless participants assigned to the interactive encouraging condition. These participants were less likely to endorse the third manipulation item \((M = 1.46, SD = 0.86)\) compared to participants who weren’t shown this message \((M = 2.38, SD = 1.36)\), \(t(321) = -8.01, p < .01, d = -0.74\). Thus, the consequence message was ineffective in communicating to participants the importance of responding carefully.

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The fourth consequence message check stated, “I received an Internet pop-up message that stated my response patterns were similar to someone not putting forth their full effort into the survey.” Participants who actually encountered this warning message were careless responders assigned to either interactive consequence conditions. Those participants who triggered the interactive consequence messages ($M = 4.19$, $SD = 1.27$) were more likely to endorse this item compared to those who failed to encounter an interactive message ($M = 1.48$, $SD = 1.01$), $t(29) = 9.69$, $p < .01$, $d = 2.60$ (see Table 3). These findings provide partial support the effectiveness of the consequence manipulation. Overall, I observed partial support for the effectiveness of the consequence warning manipulations.

**Social Power manipulation.** The social power manipulation check items measured the extent to which the researcher influenced participants’ responding behaviors during the study. In order to test the effectiveness of the social power manipulation, I compared participants’ self-reported power perceptions across the four experimental conditions. A one-way ANOVA analysis found no significant differences of social power scores across the four experimental conditions, $F(3, 397) = 0.18$, $p > .05$, $\eta^2 = .01$, although the differences across groups were in the expected direction. Note that the limited number of participants who triggered the interactive consequence message constrained the analyses (i.e., the sample sizes per cell would be extremely uneven if I considered only participants that triggered the interactive warning message). Thus, I observed no support for the effects of the interactive message on participants’ self-reported perceptions of social power.

**Hypothesis Testing Analyses**

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Effects of Interactive warning on CR (Hypothesis 1a and 1b).

Hypothesis 1a predicted that participants assigned to the interactive warning message will have lower CR scores than participants assigned to the control condition. Because the infrequency index and page time index were count variables with non-normal distributions, I tested all hypotheses using generalized linear regression models (GLMs) with a binomial distribution when the outcome variable was infrequency index and the page time index. For these tests, I compared the cell mean contrasts using the emmeans function from the emmeans package (Lenth, 2018; R Core Team, 2018). Because the multiple contrasts were non-orthogonal (see Kirk, 2013, Chapter 5), I used the Dunn-Sidak Multiple Comparison Test from the dunn.test package (Dinno, 2017; R Core Team, 2018). Cell means and standard deviations are shown in Table 4.

Because each CR index was tested twice for Hypothesis 1 (i.e., Hypothesis 1a and Hypothesis 1b), I controlled the Type-1 error rate to .025 (i.e., total Type-1 error rate divided by two; see Kirk, 2013, Chapter 5). Based on the a-priori contrasts, I observed no significant mean differences for the infrequency index, the page time index, the even-odd consistency index, the Mahalanobis D index, nor the long string index. Surprisingly, the control group engaged in significantly less CR overall than the interactive warning condition for the psychometric synonyms index ($M_{\text{diff}} = -0.03, z = -2.00, p = .02, \eta^2 = .01$; see Table 5). Note, however, that the effect size was small, so the significant difference observed should be interpreted cautiously. Thus, I found no support for Hypothesis 1a.
Hypothesis 1b predicted that those assigned to an interactive warning message will have lower incidence of CR compared to a typical non-interactive warning condition. Contrary to my expectations, I observed no significant differences between the interactive warning and traditional warning for the infrequency index, the even-odd consistency index, the Mahalanobis D index, nor the long string index. Participants assigned to the interactive warning message engaged in significantly higher levels of CR compared to those assigned to the control condition according to the page time index (OR = 0.16, z = -7.76, p < .01, $\eta^2 = .05$) and the psychometric synonyms index ($M_{diff} = -0.05, z = -2.40, p < .01, \eta^2 = .03$; see Table 5). Thus, I observed no support for Hypothesis 1b.

**Effects of the interactive messages on within-person changes in CR (Hypothesis 2).** I expected that respondents’ CR scores would decrease following the interactive consequence message. In order to test whether within-person changes in CR decreased following the interactive messages, I used repeated measure ANOVAs to test whether CR indices scores decreased over questionnaire segments for participants who triggered either interactive consequence message. I included only the 28 participants assigned to the two interactive consequences messages who triggered the message. I observed no significant decline in CR, the Mahalanobis D index, the Psychometric Synonyms index, nor the long string index. Although I observed no support for Hypothesis 2, I found medium effect sizes for the page time index ($\eta^2 = .09$), the even-odd consistency index ($\eta^2 = .08$), and the Mahalanobis D index ($\eta^2 = .08$; see Table 6). Although the results were non-significant, participants’ CR scores decreased
over time as expected. Note that the low statistical power observed when testing Hypothesis 2, which was a result of the small sample size \((n = 28)\), likely influenced the findings described above.

**Effects of the interactive encouraging message on fairness perceptions (Hypothesis 3a).** Hypothesis 3a stated that those who triggered the interactive encouraging message condition will report higher levels of perceived fairness compared to participants who triggered the interactive warning message. I tested the differences in fairness perceptions on the basis of interactive message content by running an independent-samples \(t\)-test and included only the participants who triggered the message \((n = 28)\). The results showed no differences in perceived study fairness between those who triggered the interactive encouraging message compared to participants who triggered the interactive warning message, see Table 5. Although I found no support for Hypothesis 3a, participants shown the interactive warning message \((M = 3.79, SD = 0.54)\) reported higher study fairness perceptions than participants shown the interactive encouraging message \((M = 3.46, SD = 0.54)\). Note that the medium effect size \((d = -0.63;\) see Table 7) observed highlights the practical importance of the findings that interactive warning message might enhance respondents’ fairness perceptions.

**Effects of the interactive encouraging message on study satisfaction perceptions (Hypothesis 3b).** Hypothesis 3b stated that participants who triggered the interactive encouraging condition would report higher levels of study satisfaction compared to participants who triggered the interactive warning message. Again, I included only the participants who triggered the interactive
message \((n = 28)\). The results showed no differences in perceived study fairness between participants who triggered the interactive encouragement message and participants who triggered the interactive warning message, see Table 5.

Although I found no support for Hypothesis 3b, I found that participants assigned to the interactive warning condition \((M = 3.60, SD = 0.93)\) reported higher levels of perceived study satisfaction than did participants assigned to the interactive encouraging message \((M = 3.32, SD = 1.09)\), although the effect size estimate was smaller \((d = 0.29)\) compared to perceived fairness (see Table 7). The interactive warning message may have positively influenced participants’ perception of the study’s merit.

**Effects of Interactive encouragement on CR (Hypothesis 4a and 4b).** I predicted that participants assigned to an interactive message with encouraging content will have lower CR scores than participants assigned to the control condition. Because I tested each CR index twice for Hypothesis 4 (i.e., Hypothesis 4a and Hypothesis 4b), I controlled the Type-1 error rate to .025 (i.e., total Type-1 error rate divided by two). I found significantly lower CR scores for the interactive encouraging message compared to the control condition for the infrequency index \((OR = 0.57, z = -3.13, p < .01, \eta^2 = .05)\) and the page time index \((OR = 0.62, z = -3.27, p < .01, \eta^2 = .05)\). I observed no significant differences in CR scores for the even-odd consistency index, the Mahalanobis D index), the Psychometric Synonyms index, nor the long string index (see Table 8). Thus, I found partial support for Hypothesis 4a.
Hypothesis 4b stated that participants assigned to an interactive encouraging message will have lower incidence of CR compared to those assigned to a typical non-interactive warning condition. I observed no significant differences between the interactive encouraging CR scores and traditional warning scores for the infrequency index, the even-odd consistency index, the Mahalanobis D index, the psychometric synonym index, nor the long string index. Unexpectedly, participants assigned to the interactive encouraging message had significantly higher page time scores (OR = 0.24, \( z = -5.71, p < .01, \eta^2 = .18 \); see Table 8) compared to those assigned to the control condition. Thus, I observed no support for Hypothesis 4b.

**Differences in CR scores between two interactive message types (RQ1).**
Research question one asked whether participants assigned to an interactive, encouraging message have lower CR scores compared to participants assigned to an interactive, punitive message. Participants assigned to the interactive encouragement message scored significantly lower than the participants assigned to the interactive warning message according to the page time index (OR = 1.55, \( z = 3.03, p < .01 \)). I found no significant differences in CR scores between the two groups for the infrequency index, the even-odd consistency index, the Mahalanobis D index, the psychometric synonyms index, nor the long string index (see Table 9). Thus, I observed limited evidence of differences in CR scores across the two interactive warning conditions.
IV. DISCUSSION

The purpose of the current study was to examine the effects of interactive consequence messages on CR. This study was the first to incorporate interactive messages to prevent CR, although several authors have used traditional, non-interactive warning messages (e.g., Gibson & Bowling, 2019; Huang et al., 2012). Contrary to my expectations, I found that an interactive warning message failed to reduce CR scores compared to a control condition or to a traditional warning message (Hypotheses 1a and Hypothesis 1b). I observed no significant within-person decreases in CR after respondents encountered the interactive warning. Thus, the interactive warning message failed to reduce within-person CR scores (Hypothesis 2).

Hypotheses 3a and 3b predicted that participants who triggered the interactive encouraging message would report higher levels of perceived fairness and study satisfaction, respectively. I observed no support for these hypotheses, as participants who triggered the interactive warning message reported higher levels of perceived fairness and study satisfaction compared to those shown the interactive warning message.

I found limited support for the effectiveness of an interactive encouraging message in reducing CR compared to the control condition for the infrequency index and the page time index (Hypothesis 4a). I failed to find support, however, for the effectiveness of an interactive encouraging message in reducing CR.
compared to a traditional warning message (Hypothesis 4b). Finally, participants assigned to the interactive encouraging message had significantly lower page time index scores compared to those assigned to the interactive warning condition. This latter finding provides limited evidence that an interactive warning message may be effective in preventing participants from engaging in unusually fast responding in real time. In sum, I found very limited support for all hypotheses, which I explain further in the sections below.

**Theoretical Implications**

The current findings have implications for researchers’ understanding of CR. First, CR researchers have measured the usefulness of prevention methods by comparing CR indices mean scores across the experimental conditions. Using this approach, I found very limited support for the interactive consequence messages in reducing CR compared to both the control condition and traditional warning condition. Because prior research has identified CR as a typically motivational phenomenon (see Meade & Craig, 2012; Huang et al., 2012), these results would suggest that an interactive message does not increase the motivation for respondents to complete the questionnaire carefully compared to a traditional warning message. Note that comparing the overall mean CR scores across experimental conditions might not be a sound approach for comparing the effectiveness of CR prevention techniques due to several issues (e.g., a small subset of respondents actually engage in CR creating skewed response distributions). Rather, comparing the number of people who were identified as careless (using the conservative estimates for cutoff scores typically used; see
Curran, 2016) per condition might be a better approach, and I describe this approach further below.

The extent to which it is appropriate to compare mean CR scores across both experimental conditions and across time remains equivocal. For example, the strength of the correlated pairs in the psychometric synonyms index were weakest in the third questionnaire segment, which might have attenuated the observed psychometric synonyms scores for this segment (i.e., the consistency indices scores appear to result in scale dependent distributions). Additionally, cutoff scores for the CR indices are still debatable (see Curran, 2016), which challenges the appropriateness of using OLS-based tests to measure differences across CR prevention techniques and differences within a specific CR index across time.

Second, careless respondents failed to reduce their CR scores following the interactive consequence messages. Respondents—even after being recognized as careless individually—lacked the motivation to exert the necessary attentional resources to respond carefully. A possible explanation for these findings is that CR is driven, at least partially, by a motivation to disrupt the experiment, which aligns with previous findings that CR related positively with a conditional reason test of implicit aggression (DeSimone, Davidson, Schoen, & Bing, 2018; Study 3). Note that neither a punitive message (i.e., a threat of the revocation of research credits) nor an encouraging message (i.e., stating the importance of CR) reduced CR scores. Thus, a subset of the population may respond carelessly regardless of the CR prevention technique adopted. More
research is needed to identify the relationship between respondent personality (e.g., implicit aggression) and CR prevention techniques.

In the context of respondent perceived fairness and satisfaction, respondents may begin to respond carelessly without conscious awareness. Note that Bowling et al. (2016) suggested that CR might be driven, at least partially, by a lack of ability to respond carefully, given the cognitive resources needed to sustain attention for long periods of time (Krosnick, 1991). The interactive message may have jarred participants, if they began engaged in CR unconsciously. This may provide an explanation for the neutral study satisfaction perceptions, especially for those who triggered the interactive encouraging message (i.e., 3.22 on a five-point scale from one to five). Indeed, prior research has found that sustained attention for lengthy time periods increases the frequency of attentional errors (Cheyne, Carriere, & Smilek, 2006; Malkovsky, Merrifield, Goldberg, & Danckert, 2012). If some participants engage in CR unconsciously, all prevention manipulations based on motivational theories might fail to deter CR. Specifically, whereas prevention methods based on motivation theories will only deter participants who engage in CR to finish the questionnaire as quickly as possible, preventative methods that provide respondents rest breaks may be needed to deter CR that occurs unconsciously. More research, however, is needed to clarify the relationship between conscious awareness and CR.

Finally, manipulations based on social power theory—particularly those used in the current study—appear to be ineffective in preventing CR. First, I observed no significant effects of the interactive messages on perceived social
power. Furthermore, the observed effect size for the interactive message on perceived power was nearly zero (i.e., $\eta^2 = .01$). In order to address prior findings that an electronic social presence had stronger effects when paired with a traditional warning message (Ward & Pond, 2015), CR researchers should investigate different theoretical models to help explain these findings.

Alternatively, the social power manipulations I used might have been too weak to influence respondent behavior. Because social power, particularly coercive power, is more salient when participants believe the agent is able to monitor the behavior (see Raven, 1959), I could have strengthened the manipulation by increasing perceived presence (e.g., recording a video where I read the manipulation scripts and the interactive messages). Below, I discuss the practical implications that stem from the current findings.

**Practical Implications**

Currently, researchers should refrain from using interactive messages in isolation to deter CR. Based on the established effectiveness of using the traditional warning messages (Gibson & Bowling, 2019; Huang et al., 2012; Meade & Craig, 2012), traditional warnings appear to be most appropriate currently. One should note, however, that the effects of a traditional warnings may weaken throughout a lengthy questionnaire (see Bowling, Gibson, Houpt, & Brower, 2018). Although not considered in the current study, researchers may consider combining a traditional warning with an interactive message, especially when the questionnaire contains many items.
In order to motivate CR participants sufficiently, research might need to use multiple prevention techniques. For example, Ward and Pond (2015) found that a warning message and a virtual monitor reduced CR scores more than either technique individually. Note that an interactive consequence message prevents CR only after respondents have begun answering carelessly. As a result, an interactive message alone may occur too late to prevent the harmful effects of CR on data quality (Huang, Liu, & Bowling, 2015). Researchers may prevent CR better by providing a motivational prevention technique throughout all questionnaire segments (e.g., combining a traditional warning message with an interactive message). This would also address any saliency attenuation of a traditional warning message after respondents have completed many items.

Manipulations based on social power theory appear to be an ineffective means to prevent CR in the current context. Thus, future attempts to reduce CR should adopt techniques based on alternative theories. Because CR occurs mostly from a lack of motivation (see Meade & Craig, 2012), motivational theories may be effective in reducing CR (e.g., goal-setting theory; Locke & Latham, 1990). Given researchers’ struggles to find large effect sizes of manipulations to prevent CR (e.g., Gibson & Bowling, 2019; Ward & Pond, 2015), researchers should expand possible theoretical underpinnings when using experimental manipulations to prevent and reduce CR.

**Future research**

In general, the findings suggest that researchers should investigate further prevention methods to deter CR. Other than traditional warning messages (e.g.,
Gibson & Bowling, 2019; Huang et al., 2012) and warnings paired with virtual agents (Ward & Pond, 2015), CR researchers have struggled to identify effective CR prevention techniques. Given the negative, often unexpected, effects of CR on data quality (Huang et al., 2015), as well as the issues with removing CR cases (see Bowling et al., 2016), future research is warranted. Because CR may occur due to both a lack of motivation and ability, combining manipulation techniques based on motivational and cognitive theories may reduce CR more than either individually.

Future research should examine respondents’ perceptions directly after encountering an interactive consequence message. When detecting CR, researchers must consider the sensitivity (i.e., the proportion of careless responders flagged correctly) and specificity (i.e., the proportion of careful respondents identified as careful) when setting cut scores for flagging CR. Stated differently, researchers will inadvertently flag careful responders as careless, and the effects of being flagged incorrectly on subsequent respondent behavior is unknown currently.

Future research should consider the effects of both item content and the psychometric properties of the substantive scales on CR scores when studying how CR rates change over time. Researchers have noted that many CR indices are scale and distribution dependent (e.g., psychometric synonyms, Mahalanobis D; Curran, 2016). The content of infrequency scales and semantic pairs may also influence CR rates, as prior research has shown that endorsement rates vary across infrequency items (e.g., Meade & Craig, 2012). Meade and Craig removed
specific items from analyses, due to exceptionally high endorsement rates and identified item content as a potential reason for those particularly high endorsement rates. Thus, future research should clarify the degree to which CR indices and substantive scales item properties influences CR rates. Otherwise, across-sample and within-person comparisons will remain ambiguous at best and futile at worst.

Future research could add physical embodiments to the virtual presence manipulation to increase the saliency of the online monitor. In the current study, I provided only a written interactive message with no other features to identify the researcher to participants. This may have diminished the interactive message algorithm’s ability to influence respondents’ behavior. Specifically, participants were unaware of the source of the virtual monitoring system. Regardless of whether the algorithm is portrayed as deriving from the researcher or a virtual agent, this information should be conveyed clearly to participants.

Finally, researchers should increase the transparency of the CR algorithm by providing information regarding the methods in which participants were flagged as careless. Prior research has found that transparency helps increase trust in automated aids (see Lyons, 2013; Lyons et al., 2017). Researchers could describe the CR index used to identify participants as careless, which might increase participants’ perceptions of the researchers’ ability to identify CR. This increased transparency may increase respondents’ commitment—and more importantly their probability of compliance—to the CR algorithm. In the section below, I describe limitations to the current study.

Limitations
When creating the questionnaire, I failed to consider the effects of both the scale reliability (i.e., when calculating the even-odd consistency index) and the strength of item correlations (i.e., when calculating the psychometric synonyms) across the four questionnaire segments. Specifically, Cronbach’s alpha estimates for the personality scales in the third segment were noticeably lower than the scales used throughout the other three questionnaire segments. Theoretically, the lower reliability estimates would have lowered the psychometric synonym scores for all participants, which would influence the observed within-person changes in CR. This occurred for several personality scales on the third questionnaire segments, which limited the opportunities to remove those scales with low internal consistency estimates when computing the consistency indices.

In order to follow IRB guidelines, I told participants that the study would last an hour and that they would receive three credits for participating. Thus, careless participants may have been suspicious that carelessness would actually result in losing their research credits. I failed to measure the extent to which participants believed I could realistically revoke their credits, which could have partially addressed this possibility.

Respondents may have ignored the careless responding messages. As shown in Appendix B to Appendix D, the careless responding messages were presented as a large block of text. Prior research has shown that participants often skim over large blocks of text without reading thoroughly (Oppenheimer, Meyvis, & Davidenko, 2009). Furthermore, Oppenheimer et al. found that participants failing to read experimental instructions can limit the effectiveness of classic
psychological manipulations. Because the careless responding messages were the main manipulation, respondents ignoring the messages may help explain the small observed effect sizes.

Finally, I failed to explain the mechanism driving the CR algorithm that indicated CR. Participants were unaware of whether the interactive consequence message was caused by a human (i.e., the researcher) or an automated aid. One method to address this issue is to either state that the researcher created the algorithm or to place the researcher’s picture alongside the interactive message. This would eliminate some ambiguity as to the driving mechanism behind the interactive consequence message.

**Conclusion**

The purpose of this study was to examine whether an interactive consequence message would deter CR in real-time and prevent CR on future questionnaire segments. Unlike a traditional warning message placed at the beginning of a survey, an interactive warning can communicate the researchers’ ability to detect CR and immediately exert a consequence for CR. Unfortunately, the interactive consequence message failed to reduce CR scores compared to a control condition and a traditional warning message, which was contrary to my predictions. On a positive note, future researchers can possibly tweak the interactive message features to have larger effects on respondents’ behavior (e.g., increase transparency and embody the monitoring agent)
V. REFERENCES


procedures for delineating and testing multilevel theories of homology. Organizational Research Methods, 8, 375-409.


Table 1

Descriptive Statistics and Correlations for CR Indices across Entire Survey

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrequency index</td>
<td>.66</td>
<td>1.39</td>
<td>(.74)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Page time index</td>
<td>.89</td>
<td>2.69</td>
<td>.48**</td>
<td>(.93)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Even-odd consistency</td>
<td>-.59</td>
<td>.16</td>
<td>.11*</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mahalanobis D index</td>
<td>402.79</td>
<td>0.10</td>
<td>-.20**</td>
<td>-.11*</td>
<td>.01</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Psychometric Synonyms</td>
<td>-.60</td>
<td>.17</td>
<td>.46**</td>
<td>.30**</td>
<td>.33**</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Long string index</td>
<td>3.88</td>
<td>1.42</td>
<td>.47**</td>
<td>.40**</td>
<td>.12*</td>
<td>.12*</td>
<td>.36**</td>
<td>(.90)</td>
</tr>
</tbody>
</table>

Note. Study 1 N = 405. Cronbach’s alpha estimates shown along diagonals

*p < .05; **p < .01.
Table 2

Descriptive Statistics and Correlations across Four Questionnaire Segments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Segment 1</th>
<th></th>
<th></th>
<th>Segment 2</th>
<th></th>
<th></th>
<th>Segment 3</th>
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<th>Segment 4</th>
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<th></th>
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<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td>3</td>
<td>4</td>
<td></td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>1. Infrequency index</td>
<td>0.11</td>
<td>0.43</td>
<td>(.67)</td>
<td>0.18</td>
<td>0.53</td>
<td>(.62)</td>
<td>0.17</td>
<td>0.47</td>
<td>(.45)</td>
<td>0.21</td>
<td>0.54</td>
<td>(.49)</td>
</tr>
<tr>
<td>2. Page time index</td>
<td>0.19</td>
<td>0.74</td>
<td>.50**</td>
<td>(.83)</td>
<td>-</td>
<td>0.25**</td>
<td>(.83)</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Even-Odd Consistency</td>
<td>-.75</td>
<td>.22</td>
<td>.24**</td>
<td>.24**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Mahalanobis D index</td>
<td>124.70</td>
<td>33.31</td>
<td>.05</td>
<td>.06</td>
<td>.25**</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td>5. Psychometric Synonyms</td>
<td>-.47</td>
<td>0.22</td>
<td>.21**</td>
<td>.10*</td>
<td>.33**</td>
<td>.00</td>
<td>-</td>
<td></td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Long string index</td>
<td>3.62</td>
<td>1.63</td>
<td>.49**</td>
<td>.38**</td>
<td>.20**</td>
<td>-.19**</td>
<td>.14**</td>
<td>(.85)</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05; **p < .01.
Table 3

ANOVA Tests for Manipulation Checks

<table>
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<tr>
<th>Outcome</th>
<th>df</th>
<th>F</th>
<th>C</th>
<th>IE</th>
<th>IW</th>
<th>TW</th>
<th>Pooled SD</th>
</tr>
</thead>
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<tr>
<td>Social Power Scale</td>
<td>3, 397</td>
<td>0.18</td>
<td>2.65</td>
<td>2.61</td>
<td>2.72</td>
<td>2.68</td>
<td>1.04</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>df</th>
<th>t</th>
<th>Incentive</th>
<th>No Incentive</th>
<th>Pooled SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>249</td>
<td>7.69**</td>
<td>3.83</td>
<td>2.73</td>
<td>1.33</td>
</tr>
<tr>
<td>249</td>
<td>10.92**</td>
<td>4.19</td>
<td>2.60</td>
<td>1.41</td>
</tr>
<tr>
<td>321</td>
<td>-8.01**</td>
<td>2.38</td>
<td>1.46</td>
<td>1.22</td>
</tr>
<tr>
<td>28</td>
<td>10.81**</td>
<td>1.48</td>
<td>4.19</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Note. N = 397-401. C = Control condition. IE = Interactive Encourage message. IW = Interactive warning condition. TW = traditional warning condition.

aThis item asked whether the researcher incorporated statistical control methods into the study (relevant to the traditional warning, interactive warning message, and interactive encouraging message conditions).

bThis item asked whether researchers told participants that careless responding would result in revoked research credits (relevant to traditional warning and interactive warning conditions).

cThis item asked whether researchers told them that it was important to be careful (relevant to traditional warning and interactive encouraging message conditions).

dThis item asked whether respondents encountered an interactive message.

*p < .01
<table>
<thead>
<tr>
<th>CR Index</th>
<th>Message Condition</th>
<th>Control</th>
<th>IE</th>
<th>IW</th>
<th>TW</th>
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</thead>
<tbody>
<tr>
<td>Infrequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Survey Segment</td>
<td>0.11 (0.44)</td>
<td>0.10 (0.39)</td>
<td>0.15 (0.52)</td>
<td>0.07 (0.35)</td>
<td>0.11 (0.43)</td>
<td></td>
</tr>
<tr>
<td>Second Survey Segment</td>
<td>0.28 (0.74)</td>
<td>0.09 (0.32)</td>
<td>0.19 (0.48)</td>
<td>0.14 (0.47)</td>
<td>0.18 (0.53)</td>
<td></td>
</tr>
<tr>
<td>Third Survey Segment</td>
<td>0.23 (0.52)</td>
<td>0.15 (0.52)</td>
<td>0.11 (0.34)</td>
<td>0.18 (0.48)</td>
<td>0.17 (0.47)</td>
<td></td>
</tr>
<tr>
<td>Fourth Survey Segment</td>
<td>0.25 (0.59)</td>
<td>0.18 (0.50)</td>
<td>0.21 (0.50)</td>
<td>0.20 (0.57)</td>
<td>0.21 (0.54)</td>
<td></td>
</tr>
<tr>
<td>Overall (12 max)</td>
<td>0.87 (1.90)</td>
<td>0.51 (0.89)</td>
<td>0.65 (1.14)</td>
<td>0.58 (1.41)</td>
<td>0.66 (1.39)</td>
<td></td>
</tr>
<tr>
<td>Page time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Survey Segment</td>
<td>0.17 (0.74)</td>
<td>0.20 (0.68)</td>
<td>0.36 (1.06)</td>
<td>0.03 (0.17)</td>
<td>0.19 (0.74)</td>
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<tr>
<td>Second Survey Segment</td>
<td>0.25 (0.93)</td>
<td>0.10 (0.44)</td>
<td>0.28 (0.85)</td>
<td>0.00 (0.00)</td>
<td>0.16 (0.67)</td>
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</tr>
<tr>
<td>Third Survey Segment</td>
<td>0.30 (1.01)</td>
<td>0.21 (0.67)</td>
<td>0.29 (0.95)</td>
<td>0.04 (0.20)</td>
<td>0.21 (0.78)</td>
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</tr>
<tr>
<td>Fourth Survey Segment</td>
<td>0.55 (1.20)</td>
<td>0.32 (0.99)</td>
<td>0.33 (0.90)</td>
<td>0.14 (0.57)</td>
<td>0.22 (0.95)</td>
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</tr>
<tr>
<td>Overall (20 max)</td>
<td>1.28 (3.52)</td>
<td>0.82 (2.29)</td>
<td>1.25 (3.19)</td>
<td>0.21 (0.70)</td>
<td>0.89 (2.69)</td>
<td></td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Survey Segment</td>
<td>-.54 (.32)</td>
<td>-.52 (.36)</td>
<td>-.53 (.31)</td>
<td>-.57 (.32)</td>
<td>-.54 (.33)</td>
<td></td>
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<tr>
<td>Second Survey Segment</td>
<td>-.63 (.35)</td>
<td>-.72 (.23)</td>
<td>-.67 (.34)</td>
<td>-.70 (.28)</td>
<td>-.68 (.30)</td>
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<tr>
<td>Third Survey Segment</td>
<td>-.42 (.48)</td>
<td>-.29 (.51)</td>
<td>-.39 (.54)</td>
<td>-.43 (.49)</td>
<td>-.39 (.51)</td>
<td></td>
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<td>Fourth Survey Segment</td>
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<td>-.53 (.45)</td>
<td>-.51 (.42)</td>
<td>-.54 (.42)</td>
<td>-.53 (.43)</td>
<td></td>
</tr>
<tr>
<td>Overall (-1.0 max)</td>
<td>-.57 (.17)</td>
<td>-.60 (.15)</td>
<td>-.58 (.16)</td>
<td>-.59 (.17)</td>
<td>-.59 (.16)</td>
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<tr>
<td>Mahalanobis D</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>First Survey Segment</td>
<td>121.8 (33.7)</td>
<td>117.6 (28.5)</td>
<td>119.1 (33.3)</td>
<td>128.4 (36.5)</td>
<td>121.7 (33.3)</td>
<td></td>
</tr>
<tr>
<td>Second Survey Segment</td>
<td>122.4 (35.9)</td>
<td>118.9 (32.9)</td>
<td>118.0 (32.4)</td>
<td>127.5 (38.3)</td>
<td>121.7 (35.1)</td>
<td></td>
</tr>
<tr>
<td>Third Survey Segment</td>
<td>126.4 (42.0)</td>
<td>116.8 (35.3)</td>
<td>118.6 (36.3)</td>
<td>125.0 (43.9)</td>
<td>121.7 (39.6)</td>
<td></td>
</tr>
<tr>
<td>Fourth Survey Segment</td>
<td>122.5 (40.7)</td>
<td>116.6 (35.8)</td>
<td>122.7 (35.1)</td>
<td>125.0 (40.8)</td>
<td>121.7 (38.2)</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>402.8 (0.1)</td>
<td>402.8 (0.1)</td>
<td>402.8 (0.1)</td>
<td>402.8 (0.1)</td>
<td>402.8 (0.1)</td>
<td></td>
</tr>
<tr>
<td>Psychometric Synonyms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Survey Segment</td>
<td>-.51 (.24)</td>
<td>-.52 (.23)</td>
<td>-.47 (.28)</td>
<td>-.49 (.24)</td>
<td>-.49 (.25)</td>
<td></td>
</tr>
<tr>
<td>Second Survey Segment</td>
<td>-.56 (.23)</td>
<td>-.58 (.23)</td>
<td>-.55 (.27)</td>
<td>-.56 (.25)</td>
<td>-.56 (.24)</td>
<td></td>
</tr>
<tr>
<td>Third Survey Segment</td>
<td>-.42 (.27)</td>
<td>-.48 (.23)</td>
<td>-.47 (.21)</td>
<td>-.50 (.24)</td>
<td>-.47 (.24)</td>
<td></td>
</tr>
<tr>
<td>Fourth Survey Segment</td>
<td>-.44 (.30)</td>
<td>-.42 (.31)</td>
<td>-.43 (.29)</td>
<td>-.52 (.26)</td>
<td>-.45 (.29)</td>
<td></td>
</tr>
<tr>
<td>Overall (-1.0 max)</td>
<td>-.60 (.19)</td>
<td>-.60 (.16)</td>
<td>-.57 (.17)</td>
<td>-.62 (.16)</td>
<td>-.60 (.17)</td>
<td></td>
</tr>
<tr>
<td>Long string</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Survey Segment</td>
<td>3.82 (1.73)</td>
<td>3.51 (0.92)</td>
<td>4.00 (2.86)</td>
<td>3.40 (0.72)</td>
<td>3.68 (1.78)</td>
<td></td>
</tr>
<tr>
<td>Second Survey Segment</td>
<td>4.07 (2.49)</td>
<td>3.83 (1.98)</td>
<td>3.73 (1.02)</td>
<td>3.41 (0.71)</td>
<td>3.76 (1.72)</td>
<td></td>
</tr>
<tr>
<td>Third Survey Segment</td>
<td>4.13 (2.36)</td>
<td>4.06 (2.46)</td>
<td>4.06 (2.07)</td>
<td>3.83 (0.87)</td>
<td>4.02 (2.04)</td>
<td></td>
</tr>
<tr>
<td>Fourth Survey Segment</td>
<td>4.36 (3.18)</td>
<td>3.90 (1.05)</td>
<td>4.16 (1.83)</td>
<td>3.80 (0.95)</td>
<td>4.05 (1.98)</td>
<td></td>
</tr>
<tr>
<td>Overall (25 max)</td>
<td>4.09 (2.20)</td>
<td>3.82 (1.11)</td>
<td>3.99 (1.21)</td>
<td>3.61 (0.63)</td>
<td>3.88 (1.42)</td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 405.
Table 5  

*Results for Hypothesis 1 for the Interactive Warning Message using the Dunnett’s Pairwise Statistics*

<table>
<thead>
<tr>
<th>CR Index</th>
<th>Message Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>TW</td>
<td>IW</td>
<td>z</td>
<td>η²</td>
</tr>
<tr>
<td>Hypothesis 1a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrequency index</td>
<td>0.87</td>
<td>N/A</td>
<td>0.65</td>
<td>-1.85</td>
<td>.01</td>
</tr>
<tr>
<td>Page time index</td>
<td>1.28</td>
<td>N/A</td>
<td>1.24</td>
<td>-0.24</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td>-.57</td>
<td>N/A</td>
<td>-.58</td>
<td>-0.57</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Mahalanobis D index</td>
<td>0.04</td>
<td>N/A</td>
<td>0.05</td>
<td>0.44</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Psychometric Synonyms</td>
<td>-.60</td>
<td>N/A</td>
<td>-.57</td>
<td>-2.00*</td>
<td>.01</td>
</tr>
<tr>
<td>Long string index (log)</td>
<td>1.35</td>
<td>N/A</td>
<td>1.35</td>
<td>-0.30</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Hypothesis 1b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrequency index</td>
<td>N/A</td>
<td>0.58</td>
<td>0.65</td>
<td>-0.64</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Page time index</td>
<td>N/A</td>
<td>0.21</td>
<td>1.24</td>
<td>-7.76*</td>
<td>.21</td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td>N/A</td>
<td>-.59</td>
<td>-.58</td>
<td>0.36</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Mahalanobis D index</td>
<td>N/A</td>
<td>-0.16</td>
<td>0.05</td>
<td>1.35</td>
<td>.01</td>
</tr>
<tr>
<td>Psychometric Synonyms</td>
<td>N/A</td>
<td>-.62</td>
<td>-.57</td>
<td>2.40*</td>
<td>.03</td>
</tr>
<tr>
<td>Long string index (log)</td>
<td>N/A</td>
<td>1.27</td>
<td>1.35</td>
<td>1.78</td>
<td>.03</td>
</tr>
</tbody>
</table>

*Note. N = 405. Mahalanobis D scores were transformed to z-scores and long string scores were log-transformed.*  

*p < .025.*
Table 6

*Results for Hypothesis 2 Testing Within-Person Changes in CR over Time*

<table>
<thead>
<tr>
<th>CR Index</th>
<th>Time Period</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time1</td>
<td>Time2</td>
<td>Time3</td>
<td>Time4</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Infrequency index</td>
<td>0.61</td>
<td>0.50</td>
<td>0.46</td>
<td>0.25</td>
<td>0.83</td>
<td>.03</td>
</tr>
<tr>
<td>Page time index</td>
<td>1.07</td>
<td>0.57</td>
<td>0.61</td>
<td>0.36</td>
<td>2.79</td>
<td>.05</td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td>-.30</td>
<td>-.52</td>
<td>-.27</td>
<td>-.48</td>
<td>2.11</td>
<td>.05</td>
</tr>
<tr>
<td>Mahalanobis D index</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>2.31</td>
<td>.03</td>
</tr>
<tr>
<td>Psychometric Synonyms</td>
<td>-.41</td>
<td>-.39</td>
<td>-.41</td>
<td>-.37</td>
<td>0.12</td>
<td>.01</td>
</tr>
<tr>
<td>Long string index (log)</td>
<td>5.95</td>
<td>5.26</td>
<td>6.14</td>
<td>4.72</td>
<td>.64</td>
<td>.02</td>
</tr>
</tbody>
</table>

Note. n = 28. No observed results were statistically significant. Mahalanobis D scores were transformed to z-scores and long string scores were log-transformed.
Table 7

Independent Samples t-tests for the Effects of Interactive Message Content on Perceived Fairness and Study Satisfaction

<table>
<thead>
<tr>
<th>Outcome</th>
<th>df</th>
<th>t</th>
<th>Encouraging</th>
<th>Warning</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Fairness</td>
<td>25</td>
<td>-1.57</td>
<td>3.46 (0.54)</td>
<td>3.79 (0.54)</td>
<td>-0.63</td>
</tr>
<tr>
<td>Study Satisfaction</td>
<td>24</td>
<td>-0.37</td>
<td>3.32 (1.09)</td>
<td>3.60 (0.93)</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Note. n = 28.
Table 8

*Results for Hypothesis 4 for the Interactive Encouraging Message using the Dunnett’s Pairwise Statistics*

<table>
<thead>
<tr>
<th>CR Index</th>
<th>Hypothesis 4a</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Message Condition</td>
<td>Control</td>
<td>TW</td>
<td>IE</td>
<td>z</td>
<td>( \eta^2 )</td>
<td></td>
</tr>
<tr>
<td>Infrequency index</td>
<td>0.87</td>
<td>N/A</td>
<td>0.51</td>
<td>-3.13*</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page time index</td>
<td>1.28</td>
<td>N/A</td>
<td>0.82</td>
<td>-3.27*</td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td>-.57</td>
<td>N/A</td>
<td>-.60</td>
<td>1.26</td>
<td>&lt;.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahalanobis D index</td>
<td>.04</td>
<td>N/A</td>
<td>0.08</td>
<td>0.04</td>
<td>&lt;.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychometric</td>
<td>-.60</td>
<td>N/A</td>
<td>-.60</td>
<td>0.00</td>
<td>&lt;.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synonyms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long string index (log)</td>
<td>1.35</td>
<td>N/A</td>
<td>1.31</td>
<td>0.67</td>
<td>&lt;.01</td>
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Hypothesis 4b

<table>
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<tr>
<th>CR Index</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Message Condition</td>
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<td>0.58</td>
<td>0.51</td>
<td>0.68</td>
<td>&lt;.01</td>
<td></td>
</tr>
<tr>
<td>Infrequency index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page time index</td>
<td></td>
<td>N/A</td>
<td>0.21</td>
<td>0.82</td>
<td>-5.71*</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td></td>
<td>N/A</td>
<td>-.59</td>
<td>-.60</td>
<td>-.22</td>
<td>&lt;.01</td>
<td></td>
</tr>
<tr>
<td>Mahalanobis D index</td>
<td></td>
<td>N/A</td>
<td>-0.16</td>
<td>0.08</td>
<td>1.87</td>
<td>&lt;.01</td>
<td></td>
</tr>
<tr>
<td>Psychometric</td>
<td></td>
<td>N/A</td>
<td>-.62</td>
<td>-.60</td>
<td>1.00</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Synonyms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long string index (log)</td>
<td></td>
<td>N/A</td>
<td>1.27</td>
<td>1.31</td>
<td>0.70</td>
<td>.01</td>
<td></td>
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</tbody>
</table>

*Note. n = 202 to 203. Mahalanobis D scores were transformed to z-scores and long string scores were log-transformed. *p < .025.
Table 9

*Results for Research Question 1 for the Interactive Consequence Messages using the Dunnett’s Pairwise Statistics*

<table>
<thead>
<tr>
<th>CR Index</th>
<th>IW</th>
<th>IE</th>
<th>z</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrequency index</td>
<td>0.65</td>
<td>0.51</td>
<td>1.32</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Page time index</td>
<td>1.24</td>
<td>0.82</td>
<td>3.03*</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Even-Odd Consistency</td>
<td>-.58</td>
<td>-.60</td>
<td>0.56</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Mahalanobis D index</td>
<td>0.05</td>
<td>0.08</td>
<td>-0.50</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Psychometric Synonyms</td>
<td>-.57</td>
<td>-.60</td>
<td>1.44</td>
<td>.01</td>
</tr>
<tr>
<td>Long string index (log)</td>
<td>1.35</td>
<td>1.31</td>
<td>1.10</td>
<td>.01</td>
</tr>
</tbody>
</table>

*Note. n = 202. Mahalanobis D scores were transformed to z-scores. IW = interactive warning. IE = interactive encouragement. *$p < .025$.}
Appendix A

Control Condition Instructions

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.
Appendix B

Typical Non-Interactive Warning Condition Instructions

It is vital to our study that participants devote their full attention to this questionnaire. Otherwise, years of effort (the researchers’ time and the time of other participants) could be wasted. Please be aware that I will use sophisticated statistical control methods to detect the accuracy and thoughtfulness of your responses. If you do not provide accurate and thoughtful responses to today’s survey, you will not receive course credit for completing the survey.
Appendix C

Interactive Warning Condition Message

Based on your response patterns thus far, your response profile is similar to that of someone who is putting forth little effort into this questionnaire. I have embedded sophisticated statistical control methods in this survey to detect the accuracy and thoughtfulness of your responses, and you have been identified as someone providing inaccurate responses. If you continue to provide inaccurate responses to this survey, you will not receive course credit for completing the survey.
Appendix D

Interactive Encouraging Condition Message

Based on your response pattern thus far, your response profile is similar to that of someone who is putting forth little effort on this survey. It is vital to this study that you devote your full attention to this questionnaire. Otherwise, years of effort (the researchers’ time and the time of other participants) would be wasted. I have embedded sophisticated statistical control methods to detect the accuracy and thoughtfulness of your responses, and you have been identified as someone providing inaccurate responses. Because I rely on you to provide accurate responses in order to run a successful study, I ask that you please put forth your utmost attention on the remaining items.
### Appendix E

#### Questionnaire Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Stem</th>
<th>Item Source</th>
<th>Construct Assessed by Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I stick to my chosen path.</td>
<td>IPIP</td>
<td>Planfulness</td>
</tr>
<tr>
<td>2.</td>
<td>I get fed up easily. (R)</td>
<td>IPIP</td>
<td>Good-nature</td>
</tr>
<tr>
<td>3.</td>
<td>I carry out my plans.</td>
<td>IPIP</td>
<td>Security</td>
</tr>
<tr>
<td>4.</td>
<td>I dislike imperfect work.</td>
<td>IPIP</td>
<td>Rationality</td>
</tr>
<tr>
<td>5.</td>
<td>I feel desperate. (R)</td>
<td>IPIP</td>
<td>Optimism</td>
</tr>
<tr>
<td>6.</td>
<td>I am an active person</td>
<td>Maniaci &amp; Rogge (2014)</td>
<td>Inconsistency Pair #1</td>
</tr>
<tr>
<td>7.</td>
<td>I challenge others' points of view.</td>
<td>IPIP</td>
<td>Dominance</td>
</tr>
<tr>
<td>8.</td>
<td>I remain calm under pressure.</td>
<td>IPIP</td>
<td>Poise</td>
</tr>
<tr>
<td>9.</td>
<td>I dislike myself. (R)</td>
<td>IPIP</td>
<td>Self-Deception</td>
</tr>
<tr>
<td>10.</td>
<td>I act wild and crazy. (R)</td>
<td>IPIP</td>
<td>Self-Control</td>
</tr>
<tr>
<td></td>
<td>I carry the conversation to a higher level.</td>
<td></td>
<td>Complexity</td>
</tr>
<tr>
<td>11.</td>
<td>I take control of things.</td>
<td>IPIP</td>
<td>Assertiveness</td>
</tr>
<tr>
<td>12.</td>
<td>I ridicule people.</td>
<td>IPIP</td>
<td>Rudeness</td>
</tr>
<tr>
<td></td>
<td>I skip difficult words while reading.</td>
<td>IPIP</td>
<td>Comprehension</td>
</tr>
<tr>
<td>15.</td>
<td>(R) I skip difficult words while reading.</td>
<td>IPIP</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>I see the humor in situations.</td>
<td>IPIP</td>
<td>Depth</td>
</tr>
<tr>
<td>17.</td>
<td>I feel threatened easily. (R)</td>
<td>IPIP</td>
<td>Poise</td>
</tr>
<tr>
<td>18.</td>
<td>I tell the truth.</td>
<td>IPIP</td>
<td>Impression Management</td>
</tr>
<tr>
<td></td>
<td>I remember my failures more easily than my successes.</td>
<td>IPIP</td>
<td>LOC: Powerful Others</td>
</tr>
<tr>
<td>19.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>I am not sure where my life is going.</td>
<td>(R)</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>I wouldn't harm a fly.</td>
<td>IPIP</td>
<td>Happiness</td>
</tr>
<tr>
<td>22.</td>
<td>I cheat to get ahead. (R)</td>
<td>IPIP</td>
<td>Impression Management</td>
</tr>
<tr>
<td>23.</td>
<td>I enjoy wild flights of fantasy.</td>
<td>IPIP</td>
<td>Imagination</td>
</tr>
<tr>
<td>24.</td>
<td>I enjoy crude jokes. (R)</td>
<td>IPIP</td>
<td>Timidity</td>
</tr>
<tr>
<td></td>
<td>I have a reputation for asking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>inappropriate questions.</td>
<td>IPIP</td>
<td>Rudeness</td>
</tr>
<tr>
<td>26.</td>
<td>I am a very energetic person.</td>
<td>Maniaci &amp; Rogge (2014)</td>
<td>Inconsistency Pair #1</td>
</tr>
<tr>
<td>27.</td>
<td>I find it difficult showing people I care about them. (R)</td>
<td>IPIP</td>
<td>Positive Expressivity</td>
</tr>
<tr>
<td></td>
<td>I am skilled in handling social situations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>I try not to think about the needy. (R)</td>
<td>IPIP</td>
<td>Responsibility</td>
</tr>
<tr>
<td>29.</td>
<td>I am guided by my moods. (R)</td>
<td>IPIP</td>
<td>Temperance</td>
</tr>
<tr>
<td>30.</td>
<td>I let my attention wander off. (R)</td>
<td>IPIP</td>
<td>Rationality</td>
</tr>
<tr>
<td></td>
<td>I get so involved with things that I forget the time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>I like to act on a whim.</td>
<td>IPIP</td>
<td>Recklessness</td>
</tr>
<tr>
<td>33.</td>
<td>I let people pull my leg. (R)</td>
<td>IPIP</td>
<td>Rationality</td>
</tr>
<tr>
<td>34.</td>
<td>I wait for others to lead the way. (R)</td>
<td>IPIP</td>
<td>Assertiveness</td>
</tr>
<tr>
<td>35.</td>
<td>I look down on any weakness. (R)</td>
<td>IPIP</td>
<td>Sympathy</td>
</tr>
<tr>
<td>36.</td>
<td>I try to forgive and forget.</td>
<td>IPIP</td>
<td>Responsibility</td>
</tr>
<tr>
<td></td>
<td>I see other people as my competitors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>(R)</td>
<td>IPIP</td>
<td>Good-nature</td>
</tr>
<tr>
<td>38.</td>
<td>I enjoy my work.</td>
<td>IPIP</td>
<td>Optimism</td>
</tr>
</tbody>
</table>
78

I tend to vote for liberal political candidates.  
I am polite to strangers. (R)  
I get bored easily. (R)  
I am not embarrassed easily.  
I would never go hang gliding or bungee jumping.  
I don't like to draw attention to myself.  
I react intensely. (R)  
I rarely look for a deeper meaning in things. (R)  
I have a lot of fun.  
I do things by the book.  
I live in a world of my own. (R)  
I do not like art. (R)  
It frustrates me when people keep me waiting  
I try to surpass others' accomplishments.  
I would never take things that aren't mine.  
I express my affection physically.  
I want to prove myself.  
I feel at ease with people.  
I leave a mess in my room.  
I sympathize with the homeless.  
I follow orders. (R)  
I take things as they come.  
I continue until everything is perfect.  

IPIP Liberalism  
IPIP Responsibility  
IPIP Stability  
IPIP Forcefulness  
IPIP Timidity  
IPIP Introversion  
IPIP Calmness  
IPIP Complexity  
IPIP Adventurousness  
IPIP Dutifulness  
IPIP Stability  
IPIP Liberalism  
IPIP Maniaci & Rogge (2014) Inconsistency Pair #1  
IPIP Dominance  
IPIP Impression Management  
IPIP Positive Expressivity  
IPIP Negative Valence  
IPIP Happiness  
IPIP Disorder  
IPIP Tolerance  
IPIP Self-Disclosure  
IPIP Calmness  
IPIP Disorder
I am not easily affected by my emotions.  
I am good at many things.  
I make enemies. (R)  
I enjoy relaxing in my free time.  
I have been to every country in the world.  
I enjoy bringing people together.  
I panic easily. (R)  
I remember my friends' birthdays.  
I know how to get around the rules.  
(R)  
I impose my will on others.  
I copy others.  
I have a broad outlook on what is going on.  
I love flowers.  
I am exacting in my work.  
I seldom joke around. (R)  
I am not always honest with myself.  
(R)  
I think highly of myself.  
I come up with alternatives.  
I seldom get mad.  
I am easily discouraged. (R)  
I have little to say. (R)  
I have time for play and relaxation.  
I demand explanations from others.
87. I lose my temper. (R)  
88. I express myself easily.  
   I always admit it when I make a mistake.  
89. I am relaxed most of the time.  
90. I go straight for the goal.  
91. I am not easily annoyed.  
92. I am afraid that I will do the wrong thing. (R)  
93. I cheer people up.  
94. I am open about myself to others.  
95. I can work under pressure.  
96. I am relaxed most of the time.  
97. I am concerned about others.  
98. I like to get lost in thought.  
99. I enjoy the company of my friends  
   I sometimes laugh out loud when reading or watching TV.  
100. I like to please others.  
101. I think quickly.  
102. I find it difficult to get down to work. (R)  
103. I do a lot in my spare time.  
104. I always know why I do things.  
105. I do things in a logical order.  
106. I speak ill of others. (R)  
107. I have a mature view on life.  
108. I don't like the idea of change. (R)  

Maniaci & Rogge (2014)  

IPIP Calmness  
IPIP Assertiveness  
IPIP Impression Management  
IPIP Calmness  
IPIP Self-Discipline  
IPIP Amiability  
IPIP Forcefulness  
IPIP Warmth  
IPIP Self-Disclosure  
IPIP Resourcefulness  
IPIP Sympathy  
IPIP Imagination  
IPIP Inconsistency Pair #1  
IPIP Positive Expressivity  
IPIP Nurturance  
IPIP Self-Efficacy  
IPIP Self-Discipline  
IPIP Politeness  
IPIP Self-Deception  
IPIP Rationality  
IPIP Calmness  
IPIP Prospective/Wisdom  
IPIP Depth
| 110. | It feels good to be appreciated. | Maniaci & Rogge (2014) | CR Infrequency |
| 111. | I am often down in the dumps. | IPIP | Happiness |
| 112. | I am willing to talk about myself. | IPIP | Complexity |
| 113. | I show a mastery of language. | IPIP | Comprehension |
| 114. | I enjoy contemplation. | IPIP | Intellect |
| 115. | I have sometimes had to tell a lie. | IPIP | Impression Management |
| 116. | I do not have a good imagination. | IPIP | Self-Efficacy |
| 117. | I automatically take charge. | IPIP | Assertiveness |
| 118. | I am full of ideas. | IPIP | Competence |
| 119. | I get upset easily. | IPIP | Good-nature |
| 120. | I amuse my friends. | IPIP | Adventurousness |
| 121. | I say nothing new. | IPIP | Insight |
| 122. | I am easily hurt. | IPIP | Competence |
| 123. | I follow through on my commitments. | IPIP | Planfulness |
| 124. | I distrust people. | IPIP | Tolerance |
| 125. | I try to avoid complex people. | IPIP | Intellect |
| 126. | I read quickly. | IPIP | Comprehension |
| 127. | I don't talk a lot. | IPIP | Introversion |
| 128. | I believe in human goodness. | IPIP | Calmness |
| 129. | I don't like action movies. | IPIP | Sentimentality |
| 130. | I am not bothered by disorder. | IPIP | Disorder |
| 131. | I am easily put out. | IPIP | Politeness |
| 132. | I know how to enjoy myself. | IPIP | LOC: Powerful Others |
| 133. | I talk mainly about myself. | IPIP | Negative Valence |
| 134. | I take precautions. | IPIP | Recklessness |
| 135. | I am not good at figuring out what really matters. | IPIP | Prospective/Wisdom |
I feel sympathy for those who are worse off than myself.  

136. I start conversations.  

137. I automatically take charge.  

138. I am willing to try anything once.  

139. I see difficulties everywhere. (R)  

140. I am not interested in speculating about things. (R)  

141. I have an active lifestyle  

142. I come up with something new.  

143. I will do anything for others.  

144. I choose the easy way. (R)  

145. I have never used a computer.  

146. I get irritated easily. (R)  

147. I am very pleased with myself.  

148. I show my feelings.  

149. I believe in a logical answer for everything.  

150. I have a soft heart.  

151. I approach others in a positive manner.  

152. I fear for the worst. (R)  

153. I put a new perspective on things.  

154. I understand people who think differently.  

155. I act without planning. (R)  

156. I break rules. (R)  

157. I know how to comfort others.  

IPIP Sympathy  

IPIP Sociability  

IPIP Assertiveness  

IPIP Playfulness  

IPIP Optimism  

IPIP Complexity  

Maniaci & Rogge (2014) Inconsistency Pair #2  

IPIP Insight  

IPIP Nurturance  

IPIP Planfulness  

Huang et al. (2014) CR Infrequency item  

IPIP Good-nature  

IPIP Forcefulness  

IPIP Self-Disclosure  

IPIP Rationality  

IPIP Nurturance  

IPIP Depth  

IPIP Optimism  

IPIP Insight  

IPIP Complexity  

IPIP Dutifulfulness  

IPIP Impression Management  

IPIP Warmth
159. I change myself to suit others. IPIP Negative Valence
160. I rush into things. IPIP Recklessness
161. I keep in the background. IPIP Introversion
162. I am likely to show off if I get the chance. (R) IPIP Impression Management
163. I do things according to a plan. IPIP Dutifulness
164. I never challenge things. (R) IPIP Self-Efficacy
165. I am not interested in theoretical discussions. (R) IPIP Intellect
166. I am not easily frustrated. IPIP Calmness
167. I know that my decisions are correct. IPIP Self-Deception
168. I get a head start on others. IPIP Rationality
169. I know that I am not a special person. (R) IPIP Competence
170. I engage in discussions. IPIP Complexity
171. I try to lead others. IPIP Assertiveness
172. I believe that too much tax money goes to support artists. (R) IPIP Liberalism
173. I look at the facts. IPIP Planfulness
174. I often feel uncomfortable around others. (R) IPIP Sociability
175. I rarely overindulge. IPIP Impression Management
176. I like to spend time with my friends. IPIP Inconsistency Pair #2
177. I get annoyed with others' behaviors. (R) IPIP Politeness
178. I make people feel at ease. IPIP Depth
179. I try out new things. IPIP Adventurousness
180. I know how things work. (R) IPIP Sentimentality
181. I avoid responsibilities. (R) IPIP Self-Discipline
182. I hang up the phone on people. (R)  
183. I investigate all possibilities (R)  
184. I reassure others.  
185. I see that rules are observed. (R)  
186. I like to solve complex problems.  
187. I enjoy thought-provoking movies.  
188. I don't like getting speeding tickets.  
189. I have a rich vocabulary.  
190. I believe that we should be tough on crime. (R)  
191. I feel that my life lacks direction.  
192. I overuse my credit. (R)  
193. I can see different points of view.  
194. I become overwhelmed by events. (R)  
195. I try to follow the rules.  
196. I like to be of service to others.  
197. I have a lot of energy  
188. CR Infrequency item  
189. Comprehension  
190. Liberalism  
191. LOC: Powerful Others  
192. Dutifulness  
193. Complexity  
194. Happiness  
195. Impression Management  
196. Responsibility  
197. Inconsistency Pair #2  
198. Amiability  
199. Sympathy  
200. Politeness  
201. Sociability  
202. Adventurousness  
203. Introversion  
204. Timidity  
205. Sentimentality
206. I readily overcome setbacks.  
207. I respect authority.  
208. I can't come up with new ideas. (R)  
209. In my time off I like to relax.  
210. I find political discussions interesting.  
211. I look for hidden meanings in things. (R)  
212. I trust others.  
213. I get angry easily. (R)  
214. I do things behind other people's backs. (R)  
215. I love excitement.  
216. I am on good terms with nearly everyone.  
217. I make plans and stick to them.  
218. I act comfortably with others.  
219. I change my mood a lot. (R)  
220. I follow through with my plans.  
221. I snap at people. (R)  
222. I cry easily.  
223. I retreat from others. (R)  
224. I waste my time. (R)  
225. I worry about what people think of me. (R)  
226. I conform to others' opinions.  
227. I have difficulty imagining things. (R)  
228. It's annoying when people are late.

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IPIP Forcefulness  
IPIP Dutifulness  
IPIP Assertiveness  
Maniaci & Rogge (2014) Inconsistency Pair #2

IPIP Intellect  
IPIP Calmness  
IPIP Stability  
IPIP Amiability  
IPIP Politeness  
IPIP Playfulness  
IPIP Calmness  
IPIP Dutifulness  
IPIP Sociability  
IPIP Temperance  
IPIP Planfulness  
IPIP Stability  
IPIP Sentimentality  
IPIP Security  
IPIP Self-Discipline  
IPIP Self-Deception  
IPIP Negative Valence  
IPIP Insight  
Maniaci & Rogge (2014) Inconsistency Pair #2
229. I dislike new foods. (R) IPIP Complexity
230. I feel lucky most of the time. IPIP Good-nature
231. I insult people. IPIP Rudeness
232. I don't always practice what I preach. (R) IPIP Impression Management
233. I laugh out loud if something is funny. IPIP Positive Expressivity
234. I have an excellent view of the world. IPIP Prospective/Wisdom
235. I bottle up my feelings. (R) IPIP Self-Disclosure
236. I don't like to get involved in other people's problems. (R) IPIP Warmth
237. I sleep less than one hour per night. Meade and Craig (2012) CR Infrequency item
238. I enjoy being reckless. (R) IPIP Timidity
239. I handle tasks smoothly. IPIP Poise
240. I take charge. (R) IPIP Introversion
241. I habitually blow my chances. (R) IPIP Optimism
242. I grumble about things. (R) IPIP Temperance
243. I get lost in my dreams. IPIP Imagination
244. I feel crushed by setbacks. (R) IPIP Competence
245. I am sure of my ground. IPIP Happiness
246. I often forget to put things back in their proper place. IPIP Disorder
247. I do not like poetry. (R) IPIP Depth
248. I let others determine my choices. (R) IPIP Self-Efficacy
249. I like to read. IPIP Comprehension
250. I believe in the importance of art. IPIP Liberalism
251. I lay down the law to others. IPIP Dominance
252. I take an interest in other people's lives. IPIP Warmth
<p>| 253. | I need the approval of others. | IPIP | Negative Valence |
| 254. | I can handle a lot of information. | IPIP | Resourcefulness |
| 255. | I am easily disturbed. (R) | IPIP | Good-nature |
| 256. | I have been described as wise beyond my years. | IPIP | Prospective/Wisdom |
| 257. | I hold a grudge. (R) | IPIP | Calmness |
| 258. | I say inappropriate things. (R) | IPIP | Temperance |
| 259. | I have little to contribute. (R) | IPIP | Insight |
| 260. | I am hard to understand. (R) | IPIP | Stability |
| 261. | I appreciate people who wait on me. | IPIP | Responsibility |
| 262. | I question my ability to do my work properly. (R) | IPIP | Competence |
| 263. | I like order. (R) | IPIP | Disorder |
| 264. | I mess things up. (R) | IPIP | Poise |
| 265. | I don't put a lot of thought into things. (R) | IPIP | Politeness |
| 266. | I like to take responsibility for making decisions. | IPIP | Self-Deception |
| 267. | I talk about my worries. | IPIP | Self-Disclosure |
| 268. | I spend most of my time worrying. | IPIP | Inconsistency Pair #3 |
| 269. | I think of others first. | IPIP | Nurturancen |
| 270. | I spend more money than I have. (R) | IPIP | Dutifulness |
| 271. | I want to be in charge. (R) | IPIP | Introversion |
| 272. | I anticipate the needs of others. | IPIP | Responsibility |
| 273. | I find it hard to forgive others. (R) | IPIP | Tolerance |
| 274. | I come up with unworkable plans. (R) | IPIP | Planfulness |
| 275. | I don't understand people who get emotional. (R) | IPIP | Sentimentality |</p>
<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Scale</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>276</td>
<td>I seldom take offense.</td>
<td>IPIP</td>
<td>Amiability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>277</td>
<td>(R) I believe that I am better than others.</td>
<td>IPIP</td>
<td>Nurturance</td>
</tr>
<tr>
<td>278</td>
<td>I take the initiative.</td>
<td>IPIP</td>
<td>Forcefulness</td>
</tr>
<tr>
<td>279</td>
<td>(R) I disregard rules.</td>
<td>IPIP</td>
<td>Self-Discipline</td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td>280</td>
<td>I experience very few emotional highs and lows.</td>
<td>IPIP</td>
<td>Self-Control</td>
</tr>
<tr>
<td>281</td>
<td>I let others make the decisions. (R)</td>
<td>IPIP</td>
<td>Assertiveness</td>
</tr>
<tr>
<td>282</td>
<td>I enjoy games of strategy. (R)</td>
<td>IPIP</td>
<td>Sentimentality</td>
</tr>
<tr>
<td>283</td>
<td>I rarely talk about sex.</td>
<td>IPIP</td>
<td>Impression Management</td>
</tr>
<tr>
<td>284</td>
<td>I have never brushed my teeth.</td>
<td>Meade and Craig (2012)</td>
<td>CR Infrequency item</td>
</tr>
<tr>
<td>285</td>
<td>I am apprehensive about new encounters. (R)</td>
<td>IPIP</td>
<td>Forcefulness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>286</td>
<td>I like to sleep on things before acting. (R)</td>
<td>IPIP</td>
<td>Recklessness</td>
</tr>
<tr>
<td>287</td>
<td>I am a very considerate person.</td>
<td>Maniaci &amp; Rogge (2014)</td>
<td>Inconsistency Pair #3</td>
</tr>
<tr>
<td>288</td>
<td>I interfere in other people's business.</td>
<td>IPIP</td>
<td>Negative Valence</td>
</tr>
<tr>
<td>289</td>
<td>I can perform a wide variety of tasks.</td>
<td>IPIP</td>
<td>Resourcefulness</td>
</tr>
<tr>
<td>290</td>
<td>I have no sympathy for criminals.</td>
<td>IPIP</td>
<td>Rationality</td>
</tr>
<tr>
<td>291</td>
<td>I suffer from others' sorrows.</td>
<td>IPIP</td>
<td>Sentimentality</td>
</tr>
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</tr>
<tr>
<td>292</td>
<td>I return extra change when a cashier makes a mistake.</td>
<td>IPIP</td>
<td>Responsibility</td>
</tr>
<tr>
<td>293</td>
<td>I use flattery to get ahead. (R)</td>
<td>IPIP</td>
<td>Impression Management</td>
</tr>
<tr>
<td>294</td>
<td>I scheme against others. (R)</td>
<td>IPIP</td>
<td>Politeness</td>
</tr>
<tr>
<td>295</td>
<td>I have frequent mood swings. (R)</td>
<td>IPIP</td>
<td>Calmness</td>
</tr>
<tr>
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</tr>
<tr>
<td>296</td>
<td>I want everything to be &quot;just right.&quot;</td>
<td>IPIP</td>
<td>Disorder</td>
</tr>
<tr>
<td>297</td>
<td>(R) I am put off by unexpected events.</td>
<td>IPIP</td>
<td>Good-nature</td>
</tr>
</tbody>
</table>
I am filled with doubts about things.  
298. (R) IPIP Security  
299. I never spend more than I can afford. IPIP Self-Control  
300. I formulate ideas clearly. IPIP Self-Efficacy  
301. I am not easily bothered by things. IPIP Optimism  
302. I find it easy to open up to my friends.  
   Manioci & Rogge (2014) Inconsistency Pair #3  
   I have difficulty understanding  
   abstract ideas. (R) IPIP Intellect  
303. I can handle complex problems. IPIP Self-Efficacy  
304. I take offense easily. (R) IPIP Optimism  
   I acknowledge others'  
   accomplishments. IPIP Tolerance  
305. I don't understand things. (R) IPIP Comprehension  
306. I try to outdo others. IPIP Competence  
307. I act quickly without thinking. (R) IPIP Calmness  
308. I just know that I will be a success. IPIP Dominance  
   I think twice before doing something. IPIP Self-Deception  
309. (R) IPIP Recklessness  
310. I do what others want me to do. (R) IPIP Self-Disclosure  
   I listen to my brain rather than my  
   heart. (R) IPIP Sympathy  
311. I play tricks on others. (R) IPIP Adventurousness  
312. I am the last to laugh at a joke. (R) IPIP Complexity  
313. I enjoy thinking about things.  
   Manioci and Rogge (2014) CR Infrequency item  
314. I look forward to my time off.  
315. I am wary of others. (R) IPIP Tolerance  
316. I cry during movies. IPIP Sentimentality
<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>321</td>
<td>I like to stand during the national anthem. (R)</td>
<td>IPIP</td>
<td>Liberalism</td>
</tr>
<tr>
<td>322</td>
<td>I use swear words. (R)</td>
<td>IPIP</td>
<td>Impression Management</td>
</tr>
<tr>
<td>323</td>
<td>Occasionally people annoy me.</td>
<td>Maniaci &amp; Rogge (2014)</td>
<td>Inconsistency Pair #3</td>
</tr>
<tr>
<td>324</td>
<td>I dislike learning. (R)</td>
<td>IPIP</td>
<td>Comprehension</td>
</tr>
<tr>
<td>325</td>
<td>I do things that others find strange. (R)</td>
<td>IPIP</td>
<td>Stability</td>
</tr>
<tr>
<td>326</td>
<td>I believe that I am important.</td>
<td>IPIP</td>
<td>Adventurousness</td>
</tr>
<tr>
<td>327</td>
<td>I demand attention. (R)</td>
<td>IPIP</td>
<td>Self-Control</td>
</tr>
<tr>
<td>328</td>
<td>I feel that my interests change quickly.</td>
<td>IPIP</td>
<td>Planfulness</td>
</tr>
<tr>
<td>329</td>
<td>I love life.</td>
<td>IPIP</td>
<td>Happiness</td>
</tr>
<tr>
<td>330</td>
<td>I do improper things. (R)</td>
<td>IPIP</td>
<td>Self-Discipline</td>
</tr>
<tr>
<td>331</td>
<td>I cut conversations short. (R)</td>
<td>IPIP</td>
<td>Politeness</td>
</tr>
<tr>
<td>332</td>
<td>I am a happy person</td>
<td>Maniaci &amp; Rogge (2014)</td>
<td>Inconsistency Pair #3</td>
</tr>
<tr>
<td>333</td>
<td>I would never cheat on my taxes.</td>
<td>IPIP</td>
<td>Impression Management</td>
</tr>
<tr>
<td>334</td>
<td>I take time out for others.</td>
<td>IPIP</td>
<td>Warmth</td>
</tr>
<tr>
<td>335</td>
<td>I hug my close friends.</td>
<td>IPIP</td>
<td>Positive Expressivity</td>
</tr>
<tr>
<td>336</td>
<td>I consider myself to be a wise person.</td>
<td>IPIP</td>
<td>Prospective/Wisdom</td>
</tr>
<tr>
<td>337</td>
<td>I demand a lot from others. (R)</td>
<td>IPIP</td>
<td>Nurturance</td>
</tr>
<tr>
<td>338</td>
<td>I am not highly motivated to succeed.</td>
<td>IPIP</td>
<td>Assertiveness</td>
</tr>
<tr>
<td>339</td>
<td>I don't bother to make an effort. (R)</td>
<td>IPIP</td>
<td>Planfulness</td>
</tr>
<tr>
<td>340</td>
<td>I can talk others into doing things. (R)</td>
<td>IPIP</td>
<td>Introversion</td>
</tr>
<tr>
<td>341</td>
<td>I rarely get irritated.</td>
<td>IPIP</td>
<td>Amiability</td>
</tr>
<tr>
<td>342</td>
<td>I try to impress others.</td>
<td>IPIP</td>
<td>Negative Valence</td>
</tr>
<tr>
<td>343</td>
<td>I have difficulty showing affection. (R)</td>
<td>IPIP</td>
<td>Positive Expressivity</td>
</tr>
</tbody>
</table>
344. I am easy to satisfy.  IPIP Calmness
345. I am often in a bad mood. (R)  IPIP Amiability
346. I have excellent ideas.  IPIP Self-Efficacy
347. I let myself go.  IPIP Adventurousness
348. I go on binges. (R)  IPIP Stability
349. I get confused easily. (R)  IPIP Competence

I get annoyed at the slightest
provocation. (R)  IPIP Good-nature
350. I want to control the conversation.  IPIP Dominance
351. I feel comfortable around people. (R)  IPIP LOC: Powerful Others
352. I say little. (R)  IPIP Self-Disclosure

I have days when I'm mad at the
world. (R)  IPIP Amiability
353. I would be happy if I won the lottery.  IPIP Maniaci and Rogge (2014) CR Infrequency item
354. I am the first to act.  IPIP Assertiveness
355. I go out of my way for others.  IPIP Nurturance

I feel that people have a hard time
understanding me. (R)  IPIP Happiness
356. I believe only in myself. (R)  IPIP Self-Disclosure
357. I am not as strict as I should be. (R)  IPIP Rationality

I don't know why I do some of the
things I do. (R)  IPIP Poise
358. I am the life of the party. (R)  IPIP Introversion
359. I avoid philosophical discussions. (R)  IPIP Intellect
360. I seek danger. (R)  IPIP Timidity

I believe there is never an excuse for
lying.  IPIP Impression Management
361. I am comfortable in unfamiliar
situations.  IPIP Happiness
367. I give up easily. (R) IPIP Forcefulness
368. I have an eye for detail. (R) IPIP Recklessness
369. I have a sharp tongue. (R) IPIP Calmness
370. I want everything to add up perfectly. (R) IPIP Disorder
371. I feel attacked by others. (R) IPIP Happiness
372. I like to organize things. IPIP Self-Discipline
373. I believe that the world is controlled by a few powerful people. IPIP LOC: Powerful Others
374. I do not think about decisions. (R) IPIP Planfulness
375. I am open to change. IPIP Adventurousness
376. I have difficulty expressing my feelings. (R) IPIP Sociability
377. I would describe my experiences as somewhat dull. (R) IPIP Insight
378. I hide my real intentions. (R) IPIP Depth
379. I do crazy things. (R) IPIP Self-Control
380. I put down others' proposals. (R) IPIP Tolerance
381. I come up with good solutions. IPIP Competence
382. I often express doubts. (R) IPIP Good-nature
383. I feel others' emotions. IPIP Warmth
384. I jump into things without thinking IPIP Recklessness
385. I like to do things for others. IPIP Sympathy
386. I choose my words with care. IPIP Planfulness
387. I resist authority. (R) IPIP Dutifulness
388. I am considered to be a wise person. IPIP Prospective/Wisdom
389. I get chores done right away. IPIP Self-Discipline
390. I am preoccupied with myself. (R) IPIP Temperance
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>391.</td>
<td>I am able to cooperate with others.</td>
<td>IPIP</td>
<td>Responsibility</td>
</tr>
<tr>
<td>392.</td>
<td>I have felt tired of sleepy in my lifetime.</td>
<td>Fervaha and Remington (2013)</td>
<td>CR Infrequency item</td>
</tr>
<tr>
<td>393.</td>
<td>I am known for saying offensive things.</td>
<td>IPIP</td>
<td>Rudeness</td>
</tr>
<tr>
<td>394.</td>
<td>I laugh at others. (R)</td>
<td>IPIP</td>
<td>Timidity</td>
</tr>
<tr>
<td>395.</td>
<td>I lose sight of what is most important in life. (R)</td>
<td>IPIP</td>
<td>Prospective/Wisdom</td>
</tr>
<tr>
<td>396.</td>
<td>I don't pay attention. (R)</td>
<td>IPIP</td>
<td>Resourcefulness</td>
</tr>
<tr>
<td>397.</td>
<td>I feel that I'm unable to deal with things. (R)</td>
<td>IPIP</td>
<td>Poise</td>
</tr>
<tr>
<td>398.</td>
<td>I feel comfortable with myself.</td>
<td>IPIP</td>
<td>Self-Deception</td>
</tr>
<tr>
<td>399.</td>
<td>I talk to a lot of different people at parties.</td>
<td>IPIP</td>
<td>Sociability</td>
</tr>
<tr>
<td>400.</td>
<td>I keep my cool.</td>
<td>IPIP</td>
<td>Optimism</td>
</tr>
<tr>
<td>401.</td>
<td>I have a poor vocabulary. (R)</td>
<td>IPIP</td>
<td>Comprehension</td>
</tr>
<tr>
<td>402.</td>
<td>I judge myself more harshly than others do. (R)</td>
<td>IPIP</td>
<td>Calmness</td>
</tr>
<tr>
<td>403.</td>
<td>I am quick to correct others.</td>
<td>IPIP</td>
<td>Dominance</td>
</tr>
<tr>
<td>404.</td>
<td>I reflect on things before acting. (R)</td>
<td>IPIP</td>
<td>Recklessness</td>
</tr>
<tr>
<td>405.</td>
<td>I avoid difficult reading material. (R)</td>
<td>IPIP</td>
<td>Intellect</td>
</tr>
<tr>
<td>406.</td>
<td>I dislike being the center of attention.</td>
<td>IPIP</td>
<td>Introversion</td>
</tr>
<tr>
<td>407.</td>
<td>I oppose authority. (R)</td>
<td>IPIP</td>
<td>Dutifulness</td>
</tr>
<tr>
<td>408.</td>
<td>I shoot my mouth off.</td>
<td>IPIP</td>
<td>Rudeness</td>
</tr>
<tr>
<td>409.</td>
<td>I am not really interested in others. (R)</td>
<td>IPIP</td>
<td>Warmth</td>
</tr>
<tr>
<td>410.</td>
<td>I give in to no one. (R)</td>
<td>IPIP</td>
<td>Self-Disclosure</td>
</tr>
<tr>
<td>411.</td>
<td>I am not afraid of providing criticism.</td>
<td>IPIP</td>
<td>Dominance</td>
</tr>
<tr>
<td>412.</td>
<td>I easily resist temptations.</td>
<td>IPIP</td>
<td>Impression-Management</td>
</tr>
</tbody>
</table>
I believe that people are essentially evil. (R)  
I express my happiness in a childlike manner.  
I accept people as they are.  
I always try to be considerate of other people.  
I do dangerous things. (R)  
I know how to convince others.  
I believe laws should be strictly enforced. (R)  
I sometimes have trouble making up my mind. (R)  
I put people under pressure.  
I disclose my intimate thoughts.  
I do things in a half-way manner. (R)  
I can tackle anything.  
I misuse power. (R)  
I do unexpected things. (R)  
I do not like concerts. (R)  
I often feel blue. (R)  
I am not bothered by messy people.  
I excel in nothing at all. (R)  
I need things explained only once.  
I have a dark outlook on the future. (R)  
It's easy for me to confide in my friends.  
I blurt out whatever comes into my mind. (R)
<table>
<thead>
<tr>
<th>Item</th>
<th>Statement</th>
<th>Measure</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>435.</td>
<td>I am quick to understand things.</td>
<td>IPIP</td>
<td>Self-Efficacy</td>
</tr>
<tr>
<td>436.</td>
<td>I rarely smile. (R)</td>
<td>IPIP</td>
<td>Depth</td>
</tr>
<tr>
<td>437.</td>
<td>I treat people as inferiors. (R)</td>
<td>IPIP</td>
<td>Tolerance</td>
</tr>
<tr>
<td>438.</td>
<td>I have a low opinion of myself. (R)</td>
<td>IPIP</td>
<td>Self-Deception</td>
</tr>
<tr>
<td>439.</td>
<td>I sympathize with others' feelings.</td>
<td>IPIP</td>
<td>Sentimentality</td>
</tr>
<tr>
<td>440.</td>
<td>I expect things to fail. (R)</td>
<td>IPIP</td>
<td>Calmness</td>
</tr>
<tr>
<td>441.</td>
<td>I get to work at once.</td>
<td>IPIP</td>
<td>Self-Discipline</td>
</tr>
<tr>
<td>442.</td>
<td>I enjoy receiving telemarketer's calls.</td>
<td>Maniaci and Rogge (2014)</td>
<td>CR Infrequency item</td>
</tr>
<tr>
<td>443.</td>
<td>I show my feelings when I'm happy.</td>
<td>IPIP</td>
<td>Positive Expressivity</td>
</tr>
<tr>
<td>444.</td>
<td>I reveal little about myself. (R)</td>
<td>IPIP</td>
<td>Self-Disclosure</td>
</tr>
<tr>
<td>445.</td>
<td>I prefer to stick with things that I know. (R)</td>
<td>IPIP</td>
<td>Intellect</td>
</tr>
<tr>
<td>446.</td>
<td>I love order and regularity. (R)</td>
<td>IPIP</td>
<td>Disorder</td>
</tr>
<tr>
<td>447.</td>
<td>I suspect hidden motives in others. (R)</td>
<td>IPIP</td>
<td>Amiability</td>
</tr>
<tr>
<td>448.</td>
<td>I get back at others. (R)</td>
<td>IPIP</td>
<td>Impression-Management</td>
</tr>
<tr>
<td>449.</td>
<td>I can't make up my mind. (R)</td>
<td>IPIP</td>
<td>Poise</td>
</tr>
<tr>
<td>450.</td>
<td>I reason logically.</td>
<td>IPIP</td>
<td>Rationality</td>
</tr>
<tr>
<td>451.</td>
<td>I throw a new light on the situation.</td>
<td>IPIP</td>
<td>Insight</td>
</tr>
<tr>
<td>452.</td>
<td>I act according to my conscience.</td>
<td>IPIP</td>
<td>Responsibility</td>
</tr>
<tr>
<td>453.</td>
<td>I am interested in many things.</td>
<td>IPIP</td>
<td>Depth</td>
</tr>
<tr>
<td>454.</td>
<td>Sometimes I find people irritating.</td>
<td>Maniaci &amp; Rogge (2014)</td>
<td>Inconsistency Pair #4</td>
</tr>
<tr>
<td>455.</td>
<td>I get caught up in my problems. (R)</td>
<td>IPIP</td>
<td>Optimism</td>
</tr>
<tr>
<td>456.</td>
<td>I love to read challenging material.</td>
<td>IPIP</td>
<td>Comprehension</td>
</tr>
<tr>
<td>457.</td>
<td>I consider myself an average person. (R)</td>
<td>IPIP</td>
<td>Insight</td>
</tr>
<tr>
<td>458.</td>
<td>I love to come up with objections. (R)</td>
<td>IPIP</td>
<td>Temperance</td>
</tr>
</tbody>
</table>
I am not interested in abstract ideas.  
(R)  
IPIP  
Intelect

I do not enjoy watching dance performances. (R)  
IPIP  
Sentimentality

I hate surprises. (R)  
IPIP  
Adventurousness

I let myself be directed by others. (R)  
IPIP  
Self-Efficacy

I suddenly lose interest. (R)  
IPIP  
Temperance

I know the answers to many questions.  
IPIP  
Comprehension

I don't mind being the center of attention. (R)  
IPIP  
Introversion

I am open about my feelings.  
IPIP  
Self-Disclosure

I am enrolled in a Psychology course currently.  
Meade and Craig (2012)  
CR Infrequency item

I rarely complain.  
IPIP  
Amiability

I pay attention to details.  
IPIP  
Poise

I hate to seem pushy. (R)  
IPIP  
Dominance

I am usually happy.  
Maniaci & Rogge (2014)  
Inconsistency Pair #4

I only feel comfortable with friends.  
(R)  
IPIP  
Sociability

I make a lot of noise. (R)  
IPIP  
Self-Control

I am easily offended. (R)  
IPIP  
Competence

I complete tasks successfully.  
IPIP  
Security

I am easily intimidated. (R)  
IPIP  
Forcefulness

I respect the opinions of others.  
IPIP  
Politeness

I want to increase my knowledge.  
IPIP  
Depth

I tend to vote for conservative political candidates. (R)  
IPIP  
Liberalism

I dislike myself. (R)  
IPIP  
Security
I keep my happy feelings to myself. (R)  
I want to be told I am right.  
I am rarely consulted for advice by others. (R)  
I believe in an eye for an eye. (R)  
I worry about things a lot.  
I try to please everyone. (R)  
I can manage many things at the same time.  
I am deeply moved by others' misfortunes.  
I am quick to judge others. (R)  
I come straight to the point.  
I believe that we coddle criminals too much. (R)  
I back out at the last moment. (R)  
I have a vivid imagination.  
I undertake few things on my own. (R)  
I seldom feel blue. (R)  
I take others' interests into account.  
I make rash decisions. (R)  
I keep my promises.  
I feel short-changed in life. (R)  
I express childlike joy.  
Generally, I was satisfied with today’s study.  
Overall, I was satisfied with the ease of completing this task.

Maniaci & Rogge (2014)  
Inconsistency Pair #4

IPIP  Positive Expressivity  
IPIP  Negative Valence  
IPIP  Prospective/Wisdom  
IPIP  Tolerance  
IPIP  Self-Disclosure  
IPIP  Resourcefulness  
IPIP  Sympathy  
IPIP  Calmness  
IPIP  Rationality  
IPIP  Liberalism  
IPIP  Politeness  
IPIP  Insight  
IPIP  Self-Efficacy  
IPIP  Security  
IPIP  Responsibility  
IPIP  Self-Control  
IPIP  Temperance  
IPIP  Optimism  
IPIP  Playfulness  
Regehr et al. (1995)  
Study Satisfaction  
Lewis (1995)  
Study Satisfaction
503. I liked participating in this study. Lewis (1995) Study Satisfaction
504. I enjoyed being a participant in this study. Lewis (1995) Study Satisfaction
505. Participating in this study was pleasant. Lewis (1995) Study Satisfaction
506. I was pleased with the way I was treated in this study. Lewis (1995) Study Satisfaction
507. I was satisfied with the experimenter of today’s study. Fogerson (2005) Study Satisfaction
508. Participating in this study was enjoyable. Croteau et al. (2010) Study Satisfaction
509. Participating in this study was a pleasant experience. Croteau et al. (2010) Study Satisfaction
510. This study was fun to complete. Croteau et al. (2010) Study Satisfaction
511. The researcher influenced me to work hard during the study. Nesler et al. (1998) Social Power
512. The researcher influenced the types of activities I performed during the study. Nesler et al. (1998) Social Power
513. The researcher influenced my research-related activities. Nesler et al. (1998) Social Power
515. The researcher could get what he wants from me. Nesler et al. (1998) Social Power
516. The researcher told me that he will use sophisticated statistical control methods to detect the accuracy and thoughtfulness of my responses to today's survey questions. Gibson & Bowling (2017) CR Message Manipulation Check
517. The researcher told me that I will lose my research credits if I fail to provide accurate and thoughtful responses to today's survey questions. Gibson & Bowling (2017) CR Message Manipulation Check
518. The researcher told me it was important to provide accurate and thoughtful in my responses to today's survey. Created for Current Study CR Message Manipulation Check
I received an Internet pop-up window that stated my response patterns were similar to someone not putting forth their full effort into the survey.

519. Created for Current Study

520. Overall, I was treated fairly in this experiment.

521. In general, the treatment I received here was fair.

522. It seems the way things worked in this experiment were not fair.

523. For the most part, this experiment treated people fairly.

524. What is your age in years?

525. What is your gender?

526. Is English your native language?