

**Evaluating the Effects of Data Collection Methodology on the
Assessment of Situations with the Riverside Situational Q-Sort**

by

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A Thesis Submitted to the Faculty of
The Charles E. Schmidt College of Science
in Partial Fulfillment of the Requirements for the Degree of
Master of Arts

Florida Atlantic University

Boca Raton, FL

August 2014


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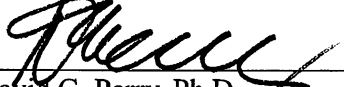
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This thesis was prepared under the direction of the candidate's thesis advisor, Dr. Ryne A. Sherman, Department of Psychology, and has been approved by the members of his supervisory committee. It was submitted to the faculty of the Charles E. Schmidt College of Science and was accepted in partial fulfillment of the requirements for the degree of Master of Arts.

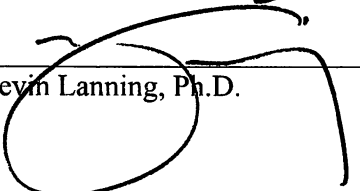
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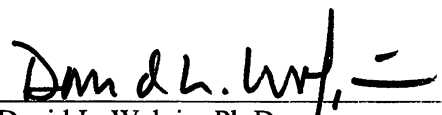
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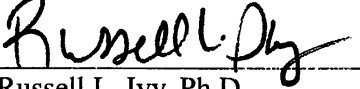
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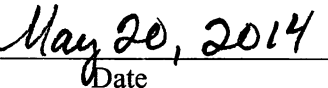
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Acknowledgements

I would like to thank my advisor, Dr. Ryne Sherman, for his guidance and expertise, without which this would not have been possible. I would also like to thank my labmates for their support throughout this project. Finally, I would like to thank my committee members for their insightful contributions.

Abstract

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Institution: Florida Atlantic University
Thesis Advisor: Dr. Ryne A. Sherman
Degree: Master of Arts
Year: 2014

The practice of evaluating situations with the Riverside Situational Q-Sort (RSQ; Wagerman & Funder, 2009) is relatively new. The present study aimed to investigate the theoretical framework supporting the RSQ with regards to the potential confounds of emotional state and the use of Likert-type ratings. Data were collected from a sample of Florida Atlantic University students ($N = 206$). Participants were primed for either a positive or negative mood state and asked to evaluate a situation with the RSQ in either the Q-Sort or Likert-type response format. Results suggested that response format has a significant influence on RSQ evaluations, but mood and the interaction between mood and response format do not. Exploratory analyses were conducted to determine the underlying mechanisms responsible.

Dedication

This manuscript is dedicated to my father, Rick Frasca. Without your support and encouragement, I would not have had the opportunity to walk down this path. I am glad that I was able to share part of this journey with you, and I wish that you were here with me to celebrate its completion.

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I. Introduction

Personality and social psychologists have long considered situations to be an important aspect of understanding behavior. Indeed, a vast majority of experimental research in social psychology depends on manipulating situational variables to observe their effects on behavior (Funder & Ozer, 1983). The situationist position was emboldened by Mischel's (1968) critique that suggested personality psychologists overestimated the role of behavioral dispositions; he proposed instead that much of behavior is the result of situation variables. The person-situation debate dominated personality psychology for decades before the controversy subsided (Kenrick & Funder, 1988; Funder, 2006). Regardless of their specific position, most, if not all, contemporary researchers consider the situation as an important component of behavior. Despite the widespread acknowledgment of the importance of situations, very few researchers have attempted to directly measure and study situations in a comprehensive way (Wagman & Funder, 2009).

Of the sparse research that has primarily focused on situations, a few different approaches have emerged. The lexical approach, popularized by Goldberg's (1981) exploration of the factor structure of personality, was implemented by Van Heck (1984). Van Heck (1984) analyzed adjectives deemed to be descriptive of situations. This resulted in a taxonomy of situations comprised of ten factors (e.g., "Interpersonal conflict," "Rituals," "Sport"). Alternatively, some researchers have taken an empirical

approach that constructed taxonomies of situations (Magnusson, 1971; Moos, 1973; Price & Buffard, 1974); however, these types of studies resulted in taxonomies that were domain specific or overly broad and difficult to interpret (Wagerman & Funder, 2009). For example, Magnusson (1971) studied situations encountered by students in an academic setting, providing a domain specific taxonomy of situations. Alternatively, Moos (1973) conceptualized three dimensions of situations through the study of different social organizations: *relationship dimensions*, *personal development dimensions*, and *system maintenance and change dimensions*. The resulting taxonomy, while empirically supported, offered only a broad categorization of situations. With little agreement on how to define and approach the problem of studying situations, it is clear why there has been a lack of consistency in the obtained results.

The issue of studying situations presents a rather difficult challenge. Operationally defining a situation, identifying when one situation ends and another begins, and devising a way to quantify situations are all issues at the heart of the problem. Further complicating this problem is the fact that situations are filtered through the perceptions of those experiencing them. Therefore, the influence a situation has on behavior will, at least to some extent, be the result of their perception of it. To address these problems, researchers have revisited and expanded upon Murray's (1938) distinction between alpha and beta press (Wagerman & Funder, 2009).

Making a distinction between alpha press and beta press is important for making the study of situations more approachable. This conceptualization considers alpha press to consist of the intrinsic elements of a situation that are objectively true, whereas beta

press involves the individual's subjective response and interpretation to the objective elements of a situation (Murray, 1938). This distinction was expanded to three levels of analysis by Block and Block (1981) and was recently adopted by Saucier, Bel-Bahar, and Fernandez (2007), as well as Gelfand (2007). The first level of analysis includes purely objective aspects of a situation, closely resembling Murray's (1938) alpha press (Wagerman & Funder, 2009). The second level of analysis involves socio-cultural elements of a situation that are consensually agreed upon and therefore may be considered objective in a relative sense. This second level of analysis also constitutes alpha press, though perhaps in a more psychologically relevant way (Wagerman & Funder, 2009). The third level of analysis is that of the subjective interpretation of situational characteristics and therefore can be considered as purely beta press (Wagerman & Funder, 2009; Sherman, Nave, & Funder, 2012; Serfass & Sherman, 2013a). Working from this framework allows for a more focused and clearly delineated approach to the study of situations.

Recently, a program of research has been developed with the goal of providing a means by which to comprehensively study situations at the second level of analysis. The particular emphasis placed on the second level of analysis is due to a few important factors. Primarily, in order to objectively study situations, researchers must analyze them independently from people's perception. (Wagerman & Funder, 2009). This stringent requirement forces situational analysis beyond level three, which specifically deals with a person's subjective response to situations, or beta press. Situational analysis at level one is certainly possible; although it clearly influences behavior, "the situation as it affects

human behavior must be more than its location or raw physical facts” (Wagerman & Funder, 2009, p. 35). Therefore, turning the analysis to level two and operating from the principle that subjective assessments of situational characteristics aggregated across individuals will provide a consensual description of situations has resulted in the construction of the Riverside Situational Q-Sort (RSQ; Wagerman & Funder, 2009; Sherman, Nave, & Funder, 2010). The RSQ, an eighty-nine item scale designed to capture the psychologically relevant aspects of situations, has since demonstrated its potential as a comprehensive tool for assessing situations.

Recent work implementing the RSQ has proven its utility in observing the complex relationships among situations, personality, and behavior (Funder, Guillaume, Kumagai, Kawamoto, & Sato, 2012; Rauthmann, et al., under review; Sherman, Nave, & Funder, 2010, 2012, 2013; Serfass & Sherman, 2013a). However, because the practice of assessing situations from this framework and implementation of the RSQ are somewhat novel, a few basic questions remain unanswered. Of these questions, two methodological concerns are particularly salient and warrant closer inspection.

Specifically, the RSQ relies on consensus to define the psychologically relevant characteristics of a situation; however, recent research has demonstrated that personality influences an individual’s situational construal as measured by the RSQ, evidencing the presence of beta press (Sherman et al., 2013). In a meta-analysis investigating the relationship between subjective well-being and personality, Steel, Schmidt, and Shultz (2008) found strong relationships between positive affect and extraversion ($r = .44$) and negative affect and neuroticism ($r = .54$). Considering the influence of personality on

situation construal and the correlations observed between affect and personality, temporary mood states may present another means by which beta press can influence RSQ assessments. This influence may be especially salient in situations in which mood states vary systematically due to the testing environment, methodology, or some other uncontrolled variable. If emotion plays a role in situation construal and significantly influences assessments made with the RSQ, researchers should administer the RSQ using procedures that take these effects into consideration.

The other salient methodological concern at the forefront is response format. The RSQ was designed to be administered as a Q-Sort, but recent studies have used a Likert-type response format. It is important then to investigate to what extent the effectiveness of the RSQ depends upon response format, if at all. The Q-Sort methodology forces participants to place items into a quasi-normal distribution. In so doing, participants are required to evaluate items in relation to the others, forcing the most characteristic and least characteristic aspects of a situation into the tails of the distribution. Alternatively, Likert-type ratings offer an unrestricted selection of responses, but are susceptible to response styles and other methodological issues. Little is known about the extent to which these issues influence data quality and how the Likert-type results will differ from those obtained using a Q-Sort response format.

Although research with the RSQ has demonstrated its utility in the study of situations, addressing the potential limitations that can result from its use is important. The primary goal of the present study is to determine how methodology influences situation assessments made with the RSQ, both in terms of response format and affect.

The following section will examine the existing literature regarding the relative strengths and weaknesses of both Likert-type and Q-Sort response formats. This section regarding response format will offer support for the hypothesis that significant differences will be observed between Q-Sorts and Likert-type ratings on the RSQ. Subsequently, the review will focus on research concerning mood and its role in various social and cognitive processes. The section concerning affect will offer support for the hypothesis that mood influences situational construal and thereby affects RSQ assessments. Finally, a foundation will be provided for the hypothesis that a significant interaction exists between response format and mood, such that mood will have a differential effect on results depending on how the RSQ is administered.

Response Format

Traditionally, Likert scales have been the primary scaling technique used in the social sciences. Stephenson (1935) first introduced the Q-Sort methodology as a psychometric technique providing an alternative scaling method. At this time, psychologists were exploring factor analytic techniques and observing correlations between tests, such as Spearman's general intelligence factor, *g* (Spearman, 1904). Stephenson (1938) aptly observed that the sample size requirements and test restrictions imposed by prominent methods could be overcome by instead administering a large number of tests or test items to a smaller sample. In so doing, an inverted factor analysis could then be conducted resulting in factor estimates of test items (Stephenson, 1938).

Although Q methodology was met with resistance soon after its inception (Burt & Stephenson, 1939; Burt, 1937), its application to numerous domains of scientific inquiry

has taken hold. Brown (1993) points out that “fundamentally, Q methodology provides a foundation for the systematic study of subjectivity” (p. 93). This ability to assess the structure of subjective attitudes has given Q methodology its broad reach. Importantly, Block (1961) shifted Q methodology away from only studying the structure of subjectivity by demonstrating that it could be used for personality assessment (Brown, 1993). He constructed the California Q-Set (CQ-Set; Block, 1961), an instrument intended to provide external, or objective assessments of personality (Brown, 1993). He drew attention to the fact that when observer evaluations were aggregated to form a consensus judgment, the results were highly reliable (Block, 1961). The CQ-Set was the foundation to the well-known research project *Lives Through Time* (Block & Haan, 1971) and has become a widely used instrument among personality psychologists. Stemming from the research tradition afforded by the CQ-Set, the Riverside Behavioral Q-Sort (RBQ: Funder, Furr, & Colvin, 2000) and the Riverside Situational Q-Sort were constructed, each representing one component of the personality triad (personality, behavior, and situations).

As previously mentioned, the RSQ was designed with the aim of comprehensively evaluating situations in order to study their complex interactions with personality and behavior (Funder, 2009). To this end, the RSQ set is comprised of statements that describe situations that offer an opportunity for personality traits to find expression. More specifically, items were drawn from the CQ-set and modified to express situational characteristics (Wagerman & Funder, 2009). The decision to present the RSQ as a Q-Sort was based upon Q methodology’s theoretical and empirical foundation which

demonstrates its effectiveness in evaluating complex stimuli. Addressing this decision, Funder (2009) states, “the intention is for people who have participated in, experienced, or observed a psychological situation to be able to translate their subjective impressions into an empirically usable format with a common vocabulary - the exact purpose of Q-Sort methodology” (p. 124). The primary benefit of Q methodology being offered in this context is that the imposed quasi-normal distribution forces participants to make comparisons among items, thereby eliminating any influence of response styles. Furthermore, the restriction of very few items to the tails of the distribution requires more careful consideration of what truly constitutes a salient characteristic/uncharacteristic item (Wagerman & Funder, 2009).

Although the RSQ may be relatively immune to response sets when presented in the Q-Sort format, recent research has identified ordering effects in sorted data (Serfass & Sherman, 2013b). This research demonstrated that across multiple studies utilizing different instruments, Q-Sort data showed reliable evidence of decreased variance and more central placement for items appearing at the end of the sort (Serfass & Sherman, 2013b). This finding suggests that participants tend to place items appearing late in the set into the neutral center, instead of conducting careful comparisons among items. If participants fail to make these relative comparisons, some of the benefits offered by Q methodology may be overstated.

In contrast to Q methodology, Likert-type rating scales stand as one of the most popular and widely used techniques to obtain self-report data. Likert (1932) first introduced this method for scaling attitudes by requiring participants to indicate their

level of agreement with a stimulus statement. Likert scales are bipolar and ascribe a numerical value corresponding with responses ranging from strongly disagree, disagree, neither agree nor disagree, agree, and strongly agree. Likert-*type* ratings follow a similar format, however they vary in the number of response choices offered, their polarity (unipolar/bipolar), and often use different response labels.

Although Likert-type ratings have become a standard scaling technique within Personality, Social Psychology, and beyond, they are not without fault. Researchers have long debated several issues inherent in the Likert-type method. Some of these issues include the ideal number of response choices (Matell & Jacoby, 1971; Lissitz & Green, 1975; Dawes, 2008), the subjectivity of intervals between response choices (Schwarz, 1999; Jamieson, 2004), response bias and response styles (Cronbach, 1946; Paulhaus, 1991), and cross-cultural comparison concerns (Chen, Lee, & Stevenson, 1995; Heine, Lehman, Peng, & Greenholtz, 2002). Some of these issues pose a threat to adopting a Likert-type response format for the RSQ and therefore must be considered. Of specific interest is the role of response styles in RSQ Likert-type ratings. Extreme response bias is a tendency to rate items using only the ends of the scale (Greenleaf, 1992). For the purposes of the Q-Sort, determining the most salient characteristic/uncharacteristic attributes of a situation becomes challenging if a majority of the items lie in the extremes. Similarly, midpoint and mild response styles that avoid extremes give rise to the same problem (Baumgartner & Steenkamp, 2001). Another relevant issue introduced by the Likert-type scaling technique is the subjectivity of intervals between choices. When participants perform a Q-Sort, the response choices and labels become somewhat

irrelevant because items are being compared with one another. However, the Likert-type format does not impose these comparisons, and thus participants are probably more likely to anchor their responses to the response labels and the number values attached to them. Because response labels can be interpreted differently for each participant, one participant's response of 7 may not be equivalent to another's (Schwarz, 1999; Cronbach, 1946). This subjectivity introduces uncontrollable variance into situational assessments and may subtly interfere with the aims of the RSQ.

One stark difference between Q methodology and Likert-type ratings is the type of measurements they produce. While Likert-type ratings produce normative data, Q-Sorts produce ipsative data. Cattell (1944) paid particular attention to the distinction between normative and ipsative forms of measurement. Ipsative forms of measurement obtain scores that are relative to the individual's mean, and therefore are a measurement within individuals. Normative forms of measurement are scores considered in relation to the group's mean, and therefore are a measurement between individuals. This distinction formed the basis of a critique of ipsative data being treated normatively during statistical analyses (Block, 1957). The primary concern was that individual differences in ipsative data are precarious because there is not a single scale to form the basis of comparison. In response to this critique, Block (1957) tested the functional equivalence of ipsative ratings treated normatively with corresponding normative data. The results of this analysis showed a median correlation corrected for attenuation of .95 in one study, and a median correlation corrected for attenuation of .79 in another (Block, 1957). The author

concluded that these results demonstrate a functional equivalence that supports the normative treatment of ipsative ratings (Block, 1957).

With regards to the present study, Block's (1957) findings support the assumption that Q-Sorts and Likert-type ratings can be compared with normative statistical techniques. Furthermore, in the context of personality measurement, these scaling techniques produce functionally equivalent data. However, what is not known is whether these different scaling techniques will produce significantly different results when applied to situation assessments made with the RSQ. Because the RSQ was initially designed to be administered as a Q-Sort, its conversion to a Likert-type format carries with it some of the conventional challenges of Likert-type ratings, as well as some that may be unique to the RSQ. Although Q-Sorts have shown some evidence of ordering effects, the Q method's forced quasi-normal distribution should successfully necessitate inter-item comparisons. The lack of imposed comparisons present in the Likert-type scaling format results in absolute judgments that are possibly influenced by response styles and subjectively interpreted intervals. For these reasons, it is hypothesized that significant differences will be observed between RSQ's administered as Q-Sorts and those given in a Likert-type format.

Affect and Beta Press

Beyond the methodological concern of response format, the influence of emotion represents another unaddressed and potentially confounding issue. The role of emotion in situational assessment is a question arising from the distinction between alpha and beta press in the levels of situational analysis framework. While the response format issue

questions the scaling requirements needed to produce valid and interpretable results, the role of emotion questions the theoretical distinctions made about the dimensions of situations. More specifically, the RSQ intends to assess situations at the second level of analysis which is theoretically rendered free from the influence of beta press through aggregation and consensus (Wagerman & Funder, 2009). However, recent research with the RSQ has shown that on the individual level, beta press in the form of personality influences situational construal (Sherman et al., 2013). This research suggests that RSQ data can only be considered free from the influence of beta press on the consensual level, but hints that any systematic variability in mood could potentially skew the consensus.

The literature on emotion is both vast and diverse, however there are some important findings that relate to the subject at hand. In a recent review, Blanchette and Richards (2010) concluded that emotion can influence higher level cognition pertaining to interpretation, judgment, decision making, and reasoning. Perhaps more closely related is the empirical evidence demonstrating state anxiety can influence interpretations of ambiguous stimuli, reporting an emotion-congruent interpretive bias (Eysenck, Mogg, May, Richards, & Mathews, 1991). Beyond interpretation, there is a growing body of evidence that emotion can lead to emotion-congruent appraisals (Blanchette & Richards, 2010). Both interpretation and appraisal being influenced by emotion are relevant findings as they suggest that situations evaluated with the RSQ may be interpreted and appraised in a manner congruent with mood.

Another pertinent body of work highlights the influence of emotions on person-perception (Forgas & Bower, 1987; Forgas, 1995; Ambady & Gray, 2002). Forgas and

Bower (1987) found robust evidence for mood-contingent processing biases. Results of their study on person-perception showed that participants invested more time and attention to details when presented with information consistent with their own mood (positive or negative), and were faster at making mood-consistent judgments (Forgas & Bower, 1987). Further, when asked to recall or recognize details of persons, memory for mood-consistent characteristics was superior (Forgas & Bower, 1987). Extending this research, Ambady and Gray (2002) found that sad participants were less accurate when making social judgments. It can be argued that the mechanisms responsible for person-perception may be strikingly similar to those that contribute to situation perception. Considering this strong possibility, it is hypothesized that significant differences will emerge when presenting the same situation to participants primed to positive and negative mood states.

One relevant body of research suggests that situation perception is moderated by cues that can alter situation construal. Cattell (1963) argued that situations can be considered to have a focal meaning that people can agree upon at the consensual level and a global meaning that is moderated by *ambient* cues on the individual level. These ambient cues interact with an individual's personality, social roles, and moods and are therefore responsible for the differences observed between individuals' situation construal (Cattell, 1963). If the RSQ contains items that represent ambient cues, then it is likely that these items will significantly differ between the mood conditions.

Thus, emotion likely plays a role in situational construal. Moreover, there is further evidence that emotion may directly influence situational assessments made with

the RSQ. Gasper and Clore (2002) conducted a study to determine the extent to which emotion regulates local versus global processing. In one study, participants were required to reproduce a drawing from memory; in the second, participants were asked to classify geometric shapes. The results of these studies indicated that participants in sad moods were more likely to be guided by local processing strategies, while participants in happy moods were using a global processing strategy. The experimenters concluded that “individuals in sad moods are less likely to see the forest and more likely to see the trees than individuals in happier moods” (Gasper & Clore, 2002, p. 39). This finding seems to suggest that positive moods elicit a holistic or gestalt processing strategy which takes into account relationships among individual elements, whereas negative moods elicit a strategy that focuses on individual elements or details. This finding has specific import to the question of how emotion influences RSQ assessments, especially in light of the debate regarding response format. If positive moods elicit a cognitive processing strategy that emphasizes the interrelationships among situational characteristics, assessments made by participants in positive moods may be less prone to the lack of forced comparisons present in the Likert-type response format. Based upon this evidence, it is hypothesized that an interaction will be observed between mood and response format, such that moods will demonstrate a greater influence on RSQ assessments made with Likert-type rating scales than with Q-Sorts.

II. Method

Participants

A total of 206 undergraduates (113 female, 93 male) from the Florida Atlantic University participant pool were recruited through the use of posted fliers. Participants received partial credit to fulfill their research participation requirement as part of an Introductory Psychology course. The ethnic breakdown was as follows: 47% Caucasian, 22% Hispanic, 17% African American, 5% Asian, 9% Other or No Response.

Procedure

Before the study began, participants were randomly assigned to a method condition (Q-Sort/Likert) and a mood condition (Positive/Negative). Upon completion of the informed consent, participants were shown a brief clip intended to induce the mood congruent with their condition. After viewing this clip, participants were administered the Positive and Negative Affect Scale (PANAS: Watson, Clark, & Tellegen, 1988) in order to assess the effectiveness of the priming. After completing the PANAS, all participants were shown the target stimulus which depicted a situation similar to what one could expect to encounter in their normal daily routine. Participants then evaluated the target situation they viewed using the RSQ, either in the Likert-type response format or the Q-Sort format. Upon completion of the RSQ, participants were debriefed to inform them of the intent of the priming portion of the study, as well as to answer any questions they had regarding the purpose of the study.

Materials

Riverside Situational Q-Sort v.3.15. The Riverside Situational Q-Sort (RSQ: Wagerman & Funder, 2009; Sherman, et al., 2010) is comprised of 89 items intended to capture the psychologically relevant characteristics of situations. Each item is composed of a statement which describes one potentially salient characteristic of a situation (e.g., “Members of the opposite sex are present,” “Social interaction is possible,” “Situation is potentially enjoyable,” for a complete list of item content see Appendix A). Half the participants were administered the RSQ in the Q-Sort format, with responses ranging from 1 (*Extremely Uncharacteristic*) to 9 (*Extremely Characteristic*) following a distribution of 3, 6, 11, 15, 19, 15, 11, 6, 3 respectively. The other half of the participants were administered the RSQ in the Likert-type rating format ranging from 1 (*Extremely Uncharacteristic*) to 9 (*Extremely Characteristic*).

Positive and Negative Affect Scales. The Positive and Negative Affect Scale (PANAS: Watson, Clark, & Tellegen, 1988) is a 20 item scale measuring positive and negative mood states. The positive scale consists of ten positive adjectives (e.g., “Enthusiastic,” “Active,” “Excited,”), and the negative scale consists of ten negative adjectives (e.g., “Scared,” “Upset,” “Distressed”). The adjectives were rated on a Likert-type scale ranging from 1 (*Very slightly or not at all*) to 5 (*Extremely*). The PANAS has been demonstrated to be highly internally consistent, and the constructs are largely uncorrelated (Watson, Clark, & Tellegen, 1988). For the purposes of this study, the PANAS sufficiently assessed the effectiveness of the mood induction priming.

Mood induction priming. Meta-analyses have shown that of the eleven most widely used mood induction procedures, presentation of a film or story are the most effective methods of inducing both positive and negative mood states (Westerman, Spies, Stahl, & Hesse, 1996). Because this study required the induction of both positive and negative mood states, presentation of a short film was used. Selection of the priming stimuli was guided by Gross and Levenson (1995) and Rottenberg, Ray, and Gross (2007) who validated the emotional responses to various film clips. The positive stimulus selected was a clip from Robin Williams Live (3'25") validated to induce the target emotion "Amusement." The negative stimulus selected was a clip from The Champ (2'25") validated to induce the target emotion "Sadness."

Target stimulus. The target stimulus used for this study was a short clip depicting a first person perspective in an everyday situation. The clip was obtained in a previous study in which participants wore small cameras and captured events of their daily lives. The selected clip was chosen from a group of six and was rated by ten research assistants on a scale from 1 (*negative*) to 5 (*positive*). Affect neutrality was chosen as the selection criteria to prevent the stimulus from influencing mood after the completion of mood induction priming. The stimulus was rated as the most affect neutral ($M = 2.9$, $SD = .56$). The clip shows a participant and a friend walking down the sidewalk past a small gathering of people on Florida Atlantic University campus.

III. Results

The present study employed a 2 (method: Likert-type/Q-Sort) \times 2 (mood: Positive/Negative) Analysis of Variance (ANOVA) design. Eighty-nine individual ANOVAs were analyzed to observe effects on the item level of the RSQ. This design offered a means by which to simultaneously test effects for method, mood, and the expected interaction between the two. Further examination of results involved exploratory analyses to determine if a pattern emerged from the data.

Preliminary Analysis

One-way ANOVAs were conducted to test for differences in positive and negative moods across the priming conditions to ensure the priming was effective. Results showed a significant difference for positive mood $F(1,204) = 15.16, p < .001$ and negative mood $F(1,204) = 75.13, p < .001$ between the priming conditions. These results suggest that the priming successfully induced higher levels of positive affect in the positive mood condition ($M = 26.62, SD = 9.08$) than the negative mood condition ($M = 22.26, SD = 6.77$), and produced higher levels of negative affect in the negative mood condition ($M = 18.85, SD = 6.89$) than the positive mood condition ($M = 12.29, SD = 3.44$).

Following the confirmation of mood priming, two-way ANOVAs were conducted for each of the 89 items of the RSQ. The results of the analysis showed 27 main effects for response format at $p < .05$, 1 main effect for mood at $p < .05$, and 1 interaction at $p < .$

05. Although the design of this experiment is ideal to test the hypotheses being investigated, using large numbers of statistical tests introduces an increased risk for Type I errors. Therefore, before interpreting results, two steps were taken to mitigate this risk: analysis of effect sizes and a randomization test.

Conversion of the F-statistic into an effect size (r) was accomplished by taking the square root of the F-value divided by the sum of the F-value and the residual degrees of freedom (df), or $\sqrt{F/(F + df)}$. Table 1 reports the effect sizes for each statistically significant finding and includes indicators of the p -values. To assist in the interpretation of the results directionality was assigned to the effects, and they were sorted by the strength of effect for method. For method effects, a positive effect is the result of a Likert-type rating with a greater mean value than for Q-Sorts, whereas a negative effect reflects a greater mean value in Q-Sorts than for Likert-type ratings. For example, item 56 (“Social interaction is possible”) showed a greater mean value on Likert-type ratings ($M = 7.52$) than for Q-Sorts ($M = 6.76$), $r = .32$. For the mood effects, a positive value shows a greater mean value for the positively primed participants than the negatively primed participants, and vice versa. For example, item 1 (“Situation is potentially enjoyable”) showed a greater mean value for the positively primed participants ($M = 4.44$) than the negatively primed participants ($M = 3.71$), $r = .15$.

The next step in the analysis involved a randomization test intended to mitigate the risk of Type I errors. Previous research has shown that when researchers are confronted with a need to compute a large number of statistical tests, randomization tests offer a means of significance testing (Sherman & Funder, 2009; Block, 1960).

Table 1.

Significant Method Effects Observed

## - RSQ Item	Method	Mood	Interaction
73 Members of the opposite sex are present.	0.32***	-0.03	0.10
56 Social interaction is possible.	0.22**	-0.05	0.06
87 Success requires cooperation.	0.21**	-0.12	0.12
85 People present at different levels of status.	0.20**	-0.06	0.12
34 Situation includes small annoyances.	0.18**	0.00	0.02
14 Situation is uncertain.	0.17*	0.04	0.04
84 Opportunity to demonstrate verbal fluency.	0.14*	-0.05	0.02
66 Situation is potentially anxiety-inducing.	0.14*	0.01	0.03
55 Potential for immediate gratification of desires.	-0.12	0.05	0.17*
57 Situation is humorous.	-0.14*	0.06	0.09
81 Others are requesting advice from P.	-0.15*	-0.00	0.04
46 Allows a free range of emotional expression.	-0.15*	-0.02	0.02
27 Situation involves competition.	-0.15*	-0.05	0.03
72 P is being abused or victimized.	-0.16*	0.07	0.05
59 Situation includes sensuous stimuli..	-0.16*	-0.06	0.08
35 Situation might evoke warmth or compassion.	-0.16*	-0.00	0.06
62 P controls resources.	-0.17*	0.01	0.05
65 Situation includes aesthetic stimuli.	-0.17*	0.01	0.04
51 Close relationships present or can develop.	-0.18**	0.05	0.12
03 A job needs to be done.	-0.18**	-0.04	0.01
88 P is being complimented or praised.	-0.21**	0.05	0.09
60 Situation is relevant to bodily health.	-0.21**	-0.04	0.01
70 Situation includes sexual stimuli.	-0.22**	0.04	0.04
02 Situation is complex.	-0.22**	0.00	0.07
53 Includes intellectual or cognitive stimuli.	-0.22***	-0.03	0.01
04 Someone is trying to impress P.	-0.24***	-0.01	0.01
76 Situation is basically simple and clear-cut.	-0.25***	0.01	0.07
01 Situation is potentially enjoyable.	-0.36***	0.15*	0.11

Note. RSQ Item content abbreviated. Positive effects for method indicate greater mean values for Likert-type ratings. Positive effects for mood indicate greater mean values for positive affect condition. *** = $p < .001$, ** = $p < .01$, * = $p < .05$

The randomization test utilized in this study functioned by generating 1,000 pseudo samples from the existent data set (see Appendix B for the complete code.) Each pseudo sample was then analyzed in a 2×2 ANOVA yielding a sampling distribution of the number of significant main effects and interactions. The distribution was then used to calculate a confidence interval for the 95th percentile of the main effects and interaction terms. A *p*-value was obtained by comparing the observed number of statistically significant effects to the sampling distribution to determine whether the number of effects observed significantly differed from the number of effects expected by chance. Table 2 shows that based on the randomization test, the observed effects (27) between Likert-type and Q-Sort response formats exceeded what is to be expected by chance ($M = 4.36$, $SD = 2.84$, $p < .001$); however, neither the main effect for mood¹ nor the interaction term reached significance. Figure 1 offers a graphical representation of the randomized sampling distribution for method and demonstrates that the differences observed between response formats are indeed a reliable phenomenon.

Table 2.

Randomization test results

	Method	Mood	Interaction
<i>N</i>	206	206	206
Observed significant	27.00	1.00	1.00
Expected by chance	4.36	4.46	4.44
SE	2.84	2.88	2.86
<i>p</i> -value	< 0.001	0.97	0.96
95 th %	10.00	10.00	10.00

Note. Based on 1,000 trials.

1 Linear regression models were conducted treating affect as a continuous variable. Results showed that affect was a significant predictor for 6 items. However, because this result is only slightly greater than what one would expect by chance (4.46), it is prudent to interpret this result with caution. Thus, affect was omitted from further analysis.

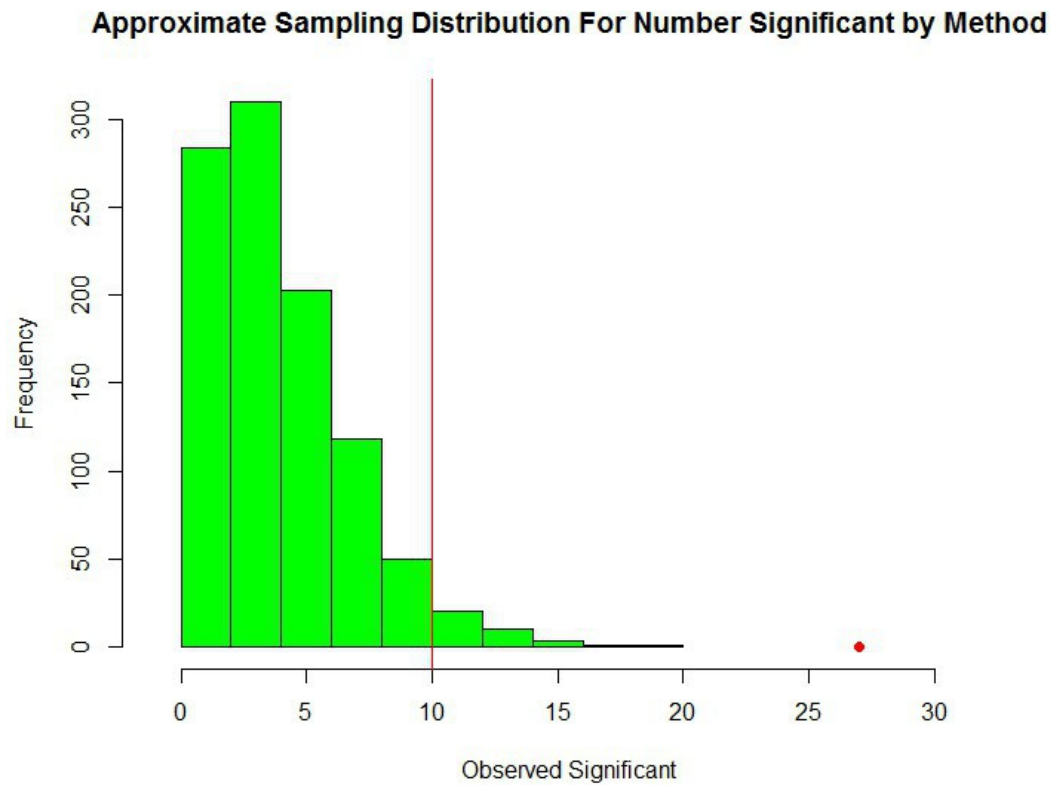


Figure 1. Approximate sampling distribution for number significant by method. Randomization distribution based on 1,000 trials. The solid vertical line indicates the 95th percentile confidence interval. The solid point indicates the observed value.

Recent research identified the eight most robust situational dimensions of the RSQ: *Duty, Intellect, Adversity, Mating, Positivity, Negativity, Deception, and Sociality*. (Rauthmann, et al., under review). As an exploratory analysis I investigated whether these situational dimensions would differ based on response format, mood, and their interaction. Composite scores for each dimension were computed by calculating the mean of the four items comprising their respective dimension. Eight ANOVAs were conducted following the same analysis procedures reported above. Table 3 summarizes the results of this analysis showing that response format influenced Positivity ($r = -.32$,

$p < .001$), Intellect ($r = -.17, p < .05$), and Duty ($r = .14, p < .05$), while mood influenced only Positivity ($r = .14, p < .05$). These results demonstrate that the Positivity and Intellect dimensions had greater means when sorted, while Duty had greater means when using Likert-type ratings. Finally, the Positivity result shows that participants in the positive condition had greater means than participants in the negative condition.

Table 3.
Big 8 composite effects

	Method	Mood	Interaction
Duty	0.14*	0.06	0.02
Intellect	-0.18*	0.02	0.02
Adversity	0.01	0.05	0.01
Mating	0.01	0.05	0.02
Positivity	-0.32***	0.14*	0.07
Negativity	0.10	0.00	0.02
Deception	0.09	0.03	0.02
Sociality	0.01	0.01	0.00

Note. Positive effects for method indicate greater mean values for Likert-type ratings. Positive effects for mood indicate greater mean values for positive affect condition.

*** = $p < .001$, ** = $p < .01$, * = $p < .05$

Exploratory Analysis

Because the primary analysis only found evidence for response format effects, mood and the format \times mood interaction were omitted from the remaining exploratory analyses. Thus, the exploratory analysis focused on interpreting the pattern of results observed for response format.

Item content. Primarily, it was believed that reviewing item content would offer a conceptual understanding of the observed effects. After examining the item content for statistically significant differences between response formats in Table 1, it appeared that a distinction could be made between situational *characteristics* and situational *cues*

(Rauthmann et al., under review). Situational cues are composed of items that can be likened to alpha press in that they typically describe physical components of a situation (e.g., “Members of the opposite sex are present”). Conversely, situational characteristics are composed of items that are more open to interpretation (e.g., “Situation is potentially enjoyable”). Because situation cues are more dichotomous in nature (i.e., they are either present or not present), participants responding on Likert-type ratings may be more likely to respond using the extremes of the scale. For example, as illustrated in Figure 2, RSQ item 73, the situation cue “Members of the opposite sex are present”, showed more extreme responding for Likert-type ratings ($M = 7.89$, $SD = 2.06$) than for Q-Sorts ($M = 6.65$, $SD = 1.62$). Alternatively, Q-Sorts require comparison among items to select the most or least salient characteristics of the situation, and although a situation cue may indeed be present in a given situation, it may not be the most salient aspect of the situation. Therefore, the distinction between situation cues and characteristics could potentially explain the mean differences observed between Likert-type ratings and Q-Sort ratings. To explore this explanation I used a logistic regression model predicting category membership from the standardized method effects plus the standardized method effects squared (see Appendix D for category membership). Results of this analysis showed that the differences between Likert-type ratings and Q-Sort ratings could not be explained by category membership.

Normative and ipsative measurement. To investigate the extent to which the different scaling techniques inherent to their respective response formats could explain the observed differences, the data were ipsatized and the ANOVAs were re-tested. The

results of the analysis showed a .74 correlation between the observed method effects of the raw data and the observed effects when ratings were ipsatized. Although there were minor variations in the weaker effects, the differences were not significant ($t(88) = 1.47$). Both mood and the interaction did not produce significant effects. These findings suggest that the differences between scaling techniques cannot explain the effects observed between response formats.

Absolute or relative judgment. Because item content proved unsuccessful in explaining the observed method effects, the focus was shifted toward the innate functioning of the different response formats. As previously mentioned, Q-Sort ratings require constant comparisons among items to determine the most and least salient characteristics of a situation. Therefore, sorted data is comprised of relative judgments of items. Conversely, Likert-type ratings require little to no comparisons among items and therefore can be considered absolute judgments of the characteristicness of each item. Figure 2 offers a visual representation of the stark differences that were observed between response formats and suggests that perhaps judgment style may be responsible for some of the observed differences. During the course of the investigation attempting to determine whether the nature of how judgments are made about each item's characteristicness may be responsible for the observed effects, *adjacency correlations* were calculated. Adjacency correlations were calculated as the average correlation between each item and the following item. Randomization was used to obtain a baseline adjacency correlation that would be expected due to chance. The randomization test calculated the average adjacency correlation of 1,000 simulated samples from the existent

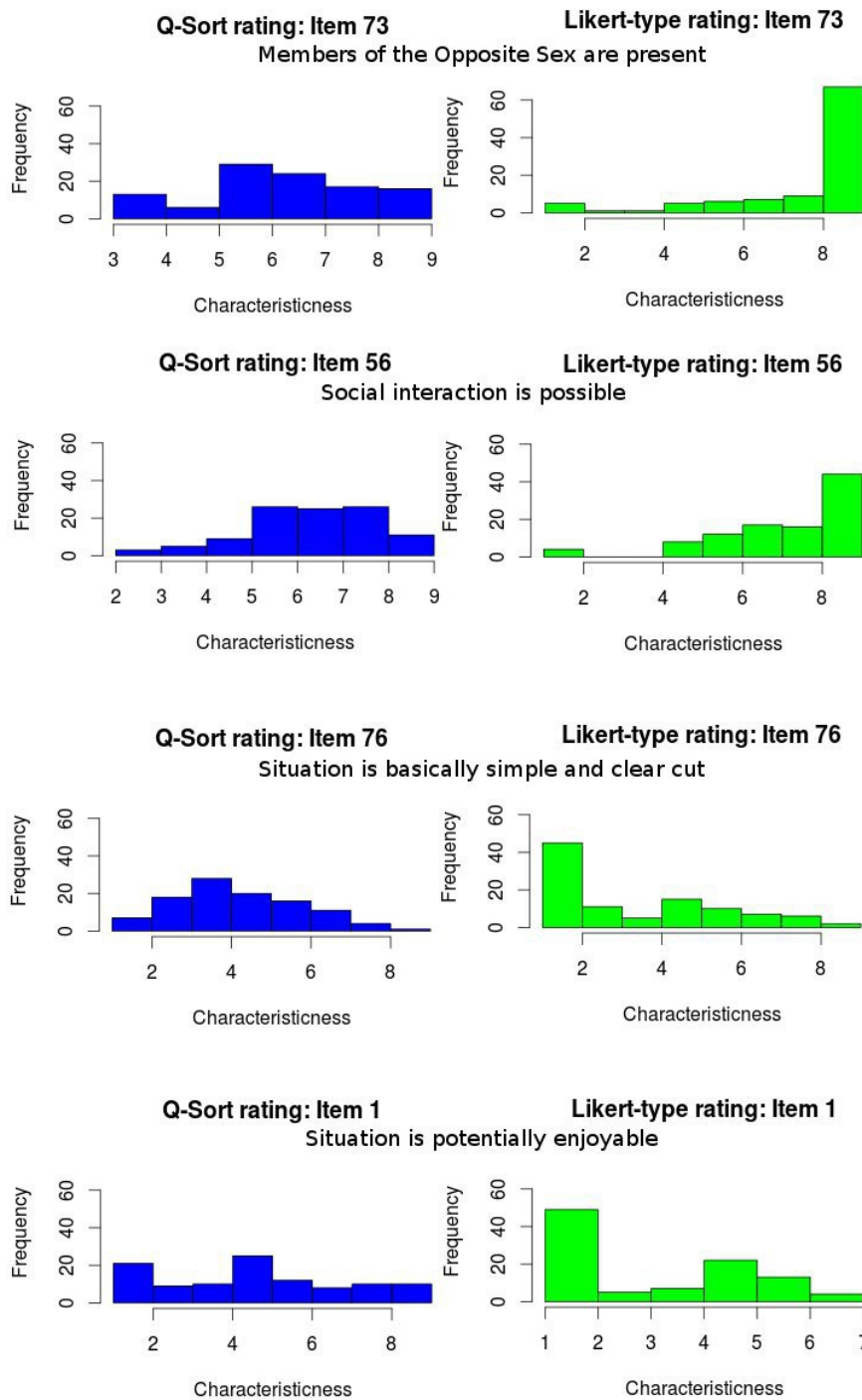


Figure 2. Histograms of the strongest method effects. This figure illustrates the unique distributions of each format and the extreme responding in Likert-type ratings.

data set. Table 4 presents the results of this analysis and shows that the average adjacency correlation for Likert-type ratings was .31, while the adjacency correlation for Q-Sort ratings was .04. Results of the randomization test revealed that the adjacency correlation for Likert-type ratings to be expected by chance were .17 and -.01 for Q-Sort ratings. To determine if these findings were observable beyond the present study, adjacency correlations were calculated in four additional studies. Two studies used Likert-type ratings with the RSQ and found adjacency correlations of .32 and .25, with adjacency correlations expected by chance of .22 and .15 respectively. Analysis of two studies using Likert-type ratings with the California Adult Q-Sort (CAQ: Block, 1961) revealed adjacency correlations of .14 and .12, with adjacency correlations expected by chance of .07 and .02 respectively. These findings suggest that when using the Likert-type response format on a Q set, participants anchor their responses to their previous response.

Table 4.

Item Adjacency correlations

<u>Study</u>	<u>Instrument</u>	<u>N</u>	<u>Adjacency (<i>r</i>)</u>	<u>Expected by chance (<i>r</i>)</u>
<u>Likert-type</u>				
PS	RSQ	101	0.31	0.17
AMT	RSQ	444	0.32	0.22
VMI	RSQ	63	0.25	0.15
VMI	CAQ	63	0.14	0.07
MPS	CAQ	189	0.12	0.06
<u>Sorts</u>				
PS	RSQ	105	0.05	-0.01
PES	RSQ	240	0.09	-0.01

Note. Abbreviations are as follows: Present Study (PS), Amazon M-Turk Situations (AMT), Video MI study (VMI), Meta-perception of Situations (MPS), and Perception of Everyday Situations (PES). Adjacency correlations are calculated as the average correlation between each item and the following item. Correlations expected by chance are calculated as the average of 1,000 adjacency correlations of randomized samples.

IV. Discussion

The present study served to test three hypotheses stemming from the use of the RSQ to comprehensively measure situations. The results demonstrated that the method by which ratings are performed have an observable effect on the data. However, contrary to the hypothesized relationship, mood did not influence ratings. Furthermore, response format and mood did not interact to influence situation assessments.

Response Format

The present study found reliable differences between Likert-type ratings and Q-Sort ratings for situations assessed with the RSQ. Although this particular study offers a novel angle to the issue of how response format can influence results, how the questions shape the answers is far from a new argument. Schwarz (1999) presented several empirical findings to support the claim that features of the research instrument, question wording, format, and context have a strong influence on responses. However, the present study addressed this issue with regards to the differences between Likert-type ratings and Q-Sort ratings, a question which has not received much attention.

One of the more perplexing findings was the influence of response format on three of the eight situational dimensions: positivity, intellect, and duty. The situational dimensions analysis found the strongest relationship between method and positivity. In other words, when sorting, the situation was considered higher in positivity. An explanation for this effect, as well as the weaker effects of method on the intellect and duty dimensions, was not apparent. Therefore, exploratory analyses were conducted in

an attempt to investigate the underlying mechanisms responsible for the observed differences in both the dimensional analysis and the method effects for the study at large.

Item content. The analysis that investigated the role of differences in item content as a potential explanation for the observed effects returned null findings. That certain items within the RSQ are more susceptible to interpretation is undoubtedly a relevant question to ask, as it addresses the distinction between alpha and beta press. The theoretical framework of the RSQ posits that situations must be measured independently of their subjective interpretations. Accomplishing this does not necessitate the removal of items that are influenced by subjective interpretation but rather can be achieved through aggregation and consensus. By aggregating responses across persons the unique interpretations are effectively removed and what is left is consensual agreement regarding the relevant characteristics of a situation. Although there may be room for interpretation on some items more so than others, the present findings suggest that these differences cannot account for the differences observed between Likert-type ratings and Q-Sort ratings.

Normative and ipsative measurement. The difference between normative and ipsative measurement scales has resulted in a debate regarding the normative treatment of ipsative data. In order to overcome these differences in the present study, the Likert-type ratings were ipsatized in order to put them on an equivalent scale as the Q-Sorts. In so doing it was possible to determine that the differences observed between response formats could not be accounted for by differences in scaling techniques. Therefore, it can be inferred that the observed differences in the present study should be attributed to

differences in the way judgments are made between formats and/or response styles and biases inherent in the different formats.

Adjacency correlations. The adjacency correlation analysis sought to offer an explanation of the observed differences between response formats that is based on the types of judgments that each format affords. Q-Sorts produce results that rely upon relative judgments that make comparisons among all items. Conversely, Likert-type ratings offer independent evaluations of each item, or absolute judgments. During the investigation of judgment type and response format, adjacency correlations were discovered. The data showed a moderate average adjacency correlation for Likert-type ratings on the RSQ that exceeded the weak correlation expected by chance. Q-Sorts did not show any such adjacency correlation. Following this analysis, adjacency correlations were found to be present in four additional data sets that implemented a Likert-type response format on Q sets.

The presence of an adjacency correlation in the Likert-type ratings implies that raters anchored their responses to their response on the preceding item. Although this is not necessarily evidence of a difference in judgment type, it introduces a previously unexplored source of response bias in Likert-type ratings of Q sets.

Affect

The present study found minimal support for the hypothesis that situation construal is influenced by mood. The only result which may provide evidence for this relationship was found in the composite situational dimensions analysis. The positivity dimension showed an effect such that positively primed participants rated this dimension

higher. A stronger conclusion could be drawn from this finding had the negativity dimension found an effect for mood, or alternatively if there were mood effects beyond what is to be expected by chance in the preliminary analysis. The lack of support for an influence of mood on situation construal seems counter-intuitive in light of the research demonstrating the role of personality in situation construal (Sherman et al., 2012; Serfass & Sherman, 2013). These previous studies have reliably shown that situation construal is associated with personality traits. Similarly, Cattell (1963) suggested a unifying theory of moderators to situation construal such that personality, social roles, and mood act to moderate situation perception. This theory posits that *ambient* cues within a given situation interact with characteristics of the individual to alter their perception of situations; this includes mood. The distinction drawn between characteristics and cues (Appendix D) within the RSQ suggests that some items are more open to interpretation, and therefore they are more susceptible to beta-press. However, an analysis of item category membership in relation to mood was meaningless considering the lack of observable differences between the positive and negative mood conditions.

The present study did not observe any effect of mood on situation construal; however, work by Blanchette and Richards (2010) indicates a potential explanation for this null finding. In their review of the influence of affect on cognition, a distinction is made between *integral* and *incidental* affect. Integral affect is an emotional state that is produced by the contents of the stimulus that the cognitive task is addressing. Incidental affect is an emotional state that is orthogonal to the contents of the cognitive task (Blanchette & Richards, 2010). Blanchette and Richards (2010) posit that this distinction

is important when considering the role of affect on higher level cognitive tasks. The present study relied on incidental affect and thus it is possible that the induced emotional state did not have any import to the cognitive task of identifying situational characteristics for a separate stimulus. This potential design flaw presents a limitation to the present study and suggests that the null finding for the influence of emotion on situation construal may not be generalizable.

Mood × Method Interaction

This study did not find any evidence to support the hypothesis that response format would interact with mood to influence situation assessments. This hypothesis was based on the finding that positive and negative moods influence processing style, such that positive moods produce a global processing style and negative moods produce a local processing style (Gasper & Clore, 2002). Based on this finding, it was believed that mood would have a differential influence on situation assessments depending on response format. The evidence suggests that although mood may influence processing style, it does not have a differential influence on Q-Sort or Likert-type situation assessments. One possible explanation for this finding is that because the differences between judgment type inherent to their respective response formats are so distinct, differences between processing styles produced by emotional states do not contribute any additional influence. Alternatively, similar to the null findings for the influence of affect on situation construal, it is possible that because the primed emotional state was not integral to the stimulus being rated, the interaction did not occur. In other words, the cognitive

task of rating the stimulus was orthogonal to the induced emotional state and therefore mood did not influence processing style during the ratings.

Limitations and Future Directions

The present study is not without limitations. Primarily, the aforementioned distinction between integral and incidental emotional states suggests that because the mood priming was produced by an orthogonal stimulus, the induced emotional state may not have influenced cognitive processing. Without knowing whether the emotional state exerted an influence on cognitive processing, it is difficult to conclude with certainty that mood does not have an influence on situation construal. Future research should consider a study design that produces integral mood states, thereby assuring the mood state will be active during the situation assessment.

Another important limitation of the present study is that because only one situation was assessed, it is difficult to know whether specific items of the RSQ are more or less vulnerable to different response formats. In other words, the present study showed several items that were distinctly different across method, however this may be partially due to the stimulus. Future research should investigate whether the observed differences are consistent across situations. It is possible that the strongest effects may be replicated, however if the differences are wholly due to the unique natures of the response formats and not specific to individual items, different items will likely emerge across situations.

Perhaps the most important limitation of the present study is the inability to determine the extent to which the differences in response format affect the practical application of the RSQ. Future research should attempt to replicate these findings with

the inclusion of either personality or behavioral measures. How these differences will influence correlations between personality constructs and situation variables, as well as the influence on the predictability of situation variables remain important questions for future research.

Future research should also investigate the prevalence and significance of adjacency correlations. The present work identified that this effect was not unique to this study or this instrument. It was suggested that at least within the context of RSQ and CAQ assessments, adjacency correlations may be a significant limitation of Likert-type ratings insofar as they contribute to measurement error. Whether this is a pervasive problem of Likert-type ratings is a potential avenue for future work.

Conclusions

The present study found significant differences between Likert-type ratings and Q-Sort ratings for situation assessments made with the RSQ. The RSQ is used in various contexts serving different research goals. Response format is often changed to suit the needs of the study's design or to alleviate time constraints. Moreover, it is not uncommon for Q-Sort data to be combined with Likert-type data within a single study. Careful consideration should be given to the effects produced by differences in response format and how they may influence results.

Appendices

Appendix A – Riverside Situational Q-Sort Version 3.15

1. Situation is potentially enjoyable.
2. Situation is complex.
3. A job needs to be done.
4. Someone is trying to impress P.
5. Someone is trying to convince P of something.
6. P is counted on to do something.
7. Talking is permitted.
8. Talking is expected or demanded.
9. P is being asked for something.
10. Someone needs help.
11. Minor details are important.
12. Situation evokes values concerning lifestyles or politics.
13. Affords an opportunity to demonstrate intellectual capacity. (e.g., an intellectual discussion, a complex problem needs to be solved)
14. Situation is uncertain.
15. Another person (present or discussed) is under threat.
16. P is being criticized, directly or indirectly.
17. Someone is attempting to dominate or boss P.
18. Situation is playful.
19. Introspection is possible. (e.g., the atmosphere allows or encourages reflection upon deeply personal issues)
20. Things are happening quickly. (Low placement implies things are happening slowly.)
21. Someone (present or discussed) is unhappy or suffering.
22. A reassuring other person is present.
23. P is being blamed for something.
24. A decision needs to be made.
25. Rational thinking is called for.
26. Situation calls for self-restraint.
27. Situation involves competition.
28. Affords an opportunity for P to do things that might make P liked or accepted.
29. Others are present who need or desire reassurance.
30. Situation entails frustration. (e.g., a goal is blocked)
31. Physical attractiveness of P is relevant.
32. It is important for P to make a good impression.
33. Situation would make some people tense and upset.
34. Situation includes one or more small annoyances.
35. Situation might evoke warmth or compassion.
36. A person or activity could be undermined or sabotaged.
37. It is possible for P to deceive someone.
38. Someone else in this situation (other than P) might be deceitful.
39. Situation may cause feelings of hostility.
40. People are disagreeing about something.
41. Affords an opportunity to express unusual ideas or points of view.
42. Situation contains physical threats.
43. Situation contains emotional threats.

44. Situation raises moral or ethical issues. (e.g., a moral dilemma is present; a discussion of morality)
45. A quick decision or quick action is called for.
46. Situation allows a free range of emotional expression.
47. Others present might have conflicting or hidden motives.
48. Situation entails or could entail stress or trauma.
49. Affords an opportunity to ruminate, daydream or fantasize.
50. Situation has potential to arouse guilt in P.
51. Close personal relationships are present or have the potential to develop.
52. Someone other than P is counted on to do something.
53. Situation includes intellectual or cognitive stimuli. (e.g., books, lectures, intellectual conversation)
54. Assertiveness is required to accomplish a goal.
55. Situation includes potential for immediate gratification of desires. (e.g., food, shopping, sexual opportunities)
56. Social interaction is possible.
57. Situation is humorous or potentially humorous. (if one finds that sort of thing funny)
58. P is the focus of attention.
59. Situation includes sensuous stimuli. (e.g., touch, taste, smell, physical contact)
60. Situation is relevant to bodily health of P. (e.g., possibility of illness; a medical visit)
61. Success in this situation requires self-insight.
62. P controls resources needed by others.
63. Others present a wide range of interpersonal cues. (e.g., body language, tone of voice, social signals)
64. Situation includes behavioral limits. (e.g., rules or social norms that might or might not be challenged)
65. Situation includes aesthetic stimuli. (e.g., art, music, drama, beauty)
66. Situation is potentially anxiety-inducing.
67. Situation makes demands on P. (either explicitly or implicitly)
68. Affords an opportunity to express or demonstrate ambition.
69. Situation might make P feel inadequate.
70. Situation includes stimuli that could be construed sexually.
71. Situational demands are rapidly shifting.
72. P is being abused or victimized.
73. Members of the opposite sex are present.
74. Potential romantic partners for P are present.
75. Situation has potential to arouse competing motivations.
76. Situation is basically simple and clear-cut.
77. Affords an opportunity to express charm.
78. Situation involves social comparison.
79. Situation raises issues of power. (for P or others present)
80. Affords an opportunity to express masculinity.
81. Others may need or are requesting advice from P.
82. Independence or autonomy of P is questioned or threatened.
83. Situation is potentially emotionally arousing.
84. Affords an opportunity for demonstrating verbal fluency. (e.g., a debate, a monologue, an active conversation)
85. People who are present occupy different social roles or levels of status.
86. P is being pressured to conform to the actions of others.
87. Success requires cooperation.
88. P is being complimented or praised.
89. Affords an opportunity to express femininity.

Appendix B

```
# A randomization test for 2x2 ANOVAs
rand.aov <- function (IVset, DVset, sims = 1000, crit = 0.95, seed = 2) {
  set1 <- data.frame(IVset)
  set2 <- data.frame(DVset)
  samp.distsigIV1 = rep(NA, sims)
  samp.distsigIV2 = rep(NA, sims)
  samp.distsigInt = rep(NA, sims)
  complete = complete.cases(cbind(set1, set2))
  set1.set = subset(set1, subset = complete)
  set2.set = subset(set2, subset = complete)
  n = nrow(set1.set)
  aovObsMat <- apply(set2.set, 2, function(x) matrix(unlist(summary(aov(x ~ set1.set[,1] *
set1.set[,2]))),ncol=5)[,5])
  SigObsIV1 <- rowSums(aovObsMat < .05)[1]
  SigObsIV2 <- rowSums(aovObsMat < .05)[2]
  SigObsInt <- rowSums(aovObsMat < .05)[3]
  if (seed != F) {
    set.seed(seed)
  }
  for (i in 1:sims) {
    rand.order = sample(n, n, replace = FALSE)
    aov.mat <- apply(set2.set[rand.order,], 2, function(x) matrix(unlist(summary(aov(x ~ set1.set[,1] *
set1.set[,2]))),ncol=5)[,5])
    samp.distsigIV1[i] <- rowSums(aov.mat < .05)[1]
    samp.distsigIV2[i] <- rowSums(aov.mat < .05)[2]
    samp.distsigInt[i] <- rowSums(aov.mat < .05)[3]
  }
  SimMeanIV1 = mean(samp.distsigIV1)
  SimMeanIV2 <- mean(samp.distsigIV2)
  SimMeanInt <- mean(samp.distsigInt)
  SimSDIV1 = sd(samp.distsigIV1)
  SimSDIV2 <- sd(samp.distsigIV2)
  SimSDInt <- sd(samp.distsigInt)
  Crit95IV1 <- quantile(samp.distsigIV1, crit)
  Crit95IV2 <- quantile(samp.distsigIV2, crit)
  Crit95Int <- quantile(samp.distsigInt, crit)
  pIV1 <- sum(samp.distsigIV1 >= SigObsIV1) / sims
  pIV2 <- sum(samp.distsigIV2 >= SigObsIV2) / sims
  pInt <- sum(samp.distsigInt >= SigObsInt) / sims
  outIV1 <- round(rbind(n, SigObsIV1, SimMeanIV1, SimSDIV1, pIV1, Crit95IV1), 4)
  outIV2 <- round(rbind(n, SigObsIV2, SimMeanIV2, SimSDIV2, pIV2, Crit95IV2), 4)
  outInt <- round(rbind(n, SigObsInt, SimMeanInt, SimSDInt, pInt, Crit95Int), 4)
  out <- data.frame(outIV1, outIV2, outInt)
  rownames(out) <- c("N", "Observed Significant", "Expected by Chance", "SE", "p", "95th %")
  colnames(out) <- c("IV1", "IV2", "Interaction")
  return(out)
}
```

Appendix C

Situation dimensions' RSQ composites.

Items	
<i>Duty</i>	
003	A job needs to be done.
006	P is counted on to do something.
011	Minor details are important.
025	Rational thinking is called for.
<i>Intellect</i>	
013	Affords an opportunity to demonstrate intellectual capacity.
053	Situation includes intellectual or cognitive stimuli.
041	Affords an opportunity to express unusual ideas or points of view.
012	Situation evokes values concerning lifestyles or politics.
<i>Adversity</i>	
015	Another person (present or discussed) is under threat.
016	P is being criticized, directly or indirectly.
023	P is being blamed for something.
017	Someone is attempting to dominate or boss P.
<i>Mating</i>	
074	Potential romantic partners for P are present.
073	Members of the opposite sex are present.
070	Situation includes stimuli that could be construed sexually.
031	Physical attractiveness of P is relevant.
<i>Positivity</i>	
018	Situation is playful.
001	Situation is potentially enjoyable.
076	Situation is basically simple and clear-cut.
057	Situation is humorous or potentially humorous.
<i>Negativity</i>	
048	Situation entails or could entail stress or trauma.
066	Situation is potentially anxiety-inducing.
033	Situation would make some people tense and upset.
030	Situation entails frustration.
<i>Deception</i>	
038	Someone else in this situation might be deceitful.
037	It is possible for P to deceive someone.
039	Situation may cause feelings of hostility.
036	A person or activity could be undermined or sabotaged.
<i>Sociality</i>	
056	Social interaction is possible.
051	Close personal relationships are present or have the potential to develop.
063	Behavior of others presents a wide range of interpersonal cues.
022	A reassuring other person is present.

Appendix D

RSQ Characteristic/Cue Categories.

Item #	Item Content	Characteristic	Cue
1	Situation is potentially enjoyable.	x	
2	Situation is complex.	x	
3	A job needs to be done.	x	
4	Someone is trying to impress P.		x
5	Someone is trying to convince P of something.		x
6	P is counted on to do something.	x	
7	Talking is permitted.	x	
8	Talking is expected or demanded.	x	
9	P is being asked for something.		x
10	Someone needs help.		x
11	Minor details are important.	x	
12	Situation evokes values concerning lifestyles or politics.	x	
13	Affords an opportunity to demonstrate intellectual capacity (e.g., an intellectual discussion, a complex problem needs to be solved).	x	
14	Situation is uncertain.	x	
15	Another person (present or discussed) is under threat.		x
16	P is being criticized, directly or indirectly.	x	
17	Someone is attempting to dominate or boss P.		x
18	Situation is playful.	x	
19	Introspection is possible (e.g., the atmosphere allows or encourages reflection upon deeply personal issues).	x	
20	Things are happening quickly.	x	
21	Someone (present or discussed) is unhappy or suffering.		x
22	A reassuring other person is present.		x
23	P is being blamed for something.	x	
24	A decision needs to be made.	x	
25	Rational thinking is called for.	x	
26	Situation calls for self-restraint.	x	
27	Situation involves competition.	x	
28	Affords an opportunity for P to do things that might make P liked or accepted.	x	
29	Others are present who need or desire reassurance.		x
30	Situation entails frustration (e.g., a goal is blocked)	x	

31	Physical attractiveness of P is relevant.	x	
32	It is important for P to make a good impression.	x	
33	Situation would make some people tense and upset.	x	
34	Situation includes one or more small annoyances.	x	
35	Situation might evoke warmth or compassion.	x	
36	A person or activity could be undermined or sabotaged.	x	
37	It is possible for P to deceive someone.	x	
38	Someone else in this situation (other than P) might be deceitful.	x	
39	Situation may cause feelings of hostility.	x	
40	People are disagreeing about something.		x
41	Affords an opportunity to express unusual ideas or points of view.	x	
42	Situation contains physical threats.		x
43	Situation contains emotional threats.		x
44	Situation raises moral or ethical issues (e.g., a moral dilemma is present; a discussion of morality).	x	
45	A quick decision or quick action is called for.	x	
46	Situation allows a free range of emotional expression.	x	
47	Others present might have conflicting or hidden motives.	x	
48	Situation entails or could entail stress or trauma.	x	
49	Affords an opportunity to ruminate, daydream or fantasize.	x	
50	Situation has potential to arouse guilt in P.	x	
51	Close personal relationships are present or have the potential to develop.	x	
52	Someone other than P is counted on to do something.		x
53	Situation includes intellectual or cognitive stimuli (e.g., books, lectures, intellectual conversation).		x
54	Assertiveness is required to accomplish a goal.	x	
55	Situation includes potential for immediate gratification of desires (e.g., food, shopping, sexual opportunities).	x	
56	Social interaction is possible.	x	
57	Situation is humorous or potentially humorous (if one finds that sort of thing funny).	x	
58	P is the focus of attention.	x	
59	Situation includes sensuous stimuli (e.g., touch, taste, smell, physical contact).		x
60	Situation is relevant to bodily health of P (e.g., possibility of illness; a medical visit).	x	
61	Success in this situation requires self-insight.	x	
62	P controls resources needed by others.	x	

63	Behavior of others presents a wide range of interpersonal cues.		x
64	Situation includes behavioral limits (that might or might not be challenged).	x	
65	Situation includes aesthetic stimuli (e.g., art, music, drama, beauty).		x
66	Situation is potentially anxiety-inducing.	x	
67	Situation includes explicit or implicit demands on P.	x	
68	Affords an opportunity to express or demonstrate ambition.	x	
69	Situation raises issues of personal adequacy (e.g., includes demands or expectations that P might not be able to meet).	x	
70	Situation includes stimuli that could be construed sexually.	x	x
71	Situational demands are rapidly shifting.	x	
72	P is being abused or victimized.	x	
73	Members of the opposite sex are present.		x
74	Potential romantic partners for P are present.	x	x
75	Situation has potential to arouse internal conflicts and related anxiety (e.g., ambivalence, approach-avoidance, competing motivations)	x	
76	Situation is basically simple and clear-cut.	x	
77	Affords an opportunity to express charm.	x	
78	Situation involves social comparison.	x	
79	Situation raises issues of power (for P or others present)	x	
80	Affords an opportunity to express masculinity.	x	
81	Others may need or are requesting advice from P.		x
82	Independence or autonomy of P is questioned or threatened.	x	
83	Situation is potentially emotionally arousing.	x	
84	Affords an opportunity for demonstrating verbal fluency (e.g., a debate, a monologue, an active conversation).	x	
85	People who are present occupy different social roles or levels of status.		x
86	P is being pressured to conform to the actions of others.	x	
87	Success requires cooperation.	x	
88	P is being complimented or praised.	x	
89	Affords an opportunity to express femininity.	x	

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