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**The Independent Effects of Personality and Situations on
Real-time Expressions of Behavior and Emotion**

Ryne A. Sherman¹

John F. Rauthmann²

Nicolas A. Brown¹, David G. Serfass,¹ & Ashley Bell Jones¹

¹Florida Atlantic University (USA)

²Humboldt-Universität zu Berlin (Germany)

Ryne A. Sherman, Department of Psychology, Florida Atlantic University; John F. Rauthmann, Department of Psychology, Humboldt-Universität zu Berlin; Nicolas A. Brown, Department of Psychology, Florida Atlantic University; David G. Serfass, Department of Psychology, Florida Atlantic University; Ashley Bell Jones, Department of Psychology, Florida Atlantic University.

Correspondence regarding this article should be sent to Ryne Sherman, Department of Psychology, Florida Atlantic University, 777 Glades Road, Boca Raton, FL 33431. E-mail: rsherm13@fau.edu. We are grateful to Jeremy Biesanz for a discussion of data analytic strategies related to this article. However, all errors or omissions remain our own.

Abstract

The joint influence of persons and situations on behavior has long been posited by personality and social psychological theory (Funder, 2006; Lewin, 1951). However, a lack of tools for real-time behavioral and situation assessment has left direct investigations of this sort immobilized. This study combines recent advances in situation assessment and experience sampling methodology to examine the simultaneous effects of personality traits and situation characteristics on real-time expressions of behavior and emotion in $N = 210$ participants. The results support an additive model such that both personality traits and situation characteristics independently predict real-time expressions of behavior and emotion. These results have implications for several prominent theoretical perspectives in personality, including both trait and cognitive theories.

Keywords: *Personality Traits, Situations, P×S Interactions, Situational Eight DIAMONDS, HEXACO*

The Independent Effects of Personality and Situations on Real-time Expressions of Behavior and Emotion

Why do people behave the way they do? Why do people feel the way they do? These two questions are fundamental to personality and social psychology. Kurt Lewin (1951) famously noted that a person's behavior (B) is a function the person (P) and his or her environment (E). A debate regarding which of these two forces, persons or situations, is a more powerful predictor of behavior (e.g., Block, 1977; Bowers, 1973; Epstein, 1979; Mischel, 1968) landed us in many ways back where we started: most modern researchers recognize that both the characteristics of persons and situations have important effects on behavior (Fleeson & Nofhle, 2009; Kenrick & Funder, 1988). Indeed, many researchers concluded that the person-situation debate was always based on a false dichotomy (e.g., Funder, 2006, 2009; Hogan, 2009; Johnson, 1999, 2009): person and situation factors are not mutually exclusive, but they interact in complex ways (Schmitt, Gollwitzer, et al., 2013). Regardless, two key re-recognitions¹ stemmed from the person-situation debate: (a) global personality traits are useful for predicting state expressions (i.e., cognitions, emotions, and behaviors) across many situations (Epstein, 1979; Fleeson, 2001, 2007; Funder & Colvin, 1991) and (b) a single state expression by a given individual in a specific situation is substantially dependent on the characteristics of his or her situation (Funder & Colvin, 1991; Mischel & Shoda, 1995; Zayas & Shoda, 2009). Nonetheless, empirical investigations of how persons and situations conjointly predict behavior enacted *in situ* are relatively scarce (cf. Fleeson, 2007). The current work thus examines the extent to which broad personality traits and people's perceptions of situation characteristics shape real-time expressions of behavioral states.

Theoretical Perspectives

Although Lewin's equation, $B = f(P, E)$, points to the importance of both persons and situations on behavior, it does not offer much in terms of explaining the processes by which persons and situations interact to produce behavior. Several theoretical perspectives speak to such processes. These perspectives are summarized here and provide context for this research, but readers are advised to consult the full accounts of these approaches to truly appreciate their insights.

Trait Theories. Trait theories of personality (e.g., Allport, 1937; Buss & Craik, 1983; DeYoung, Quilty, & Peterson, 2007; John, Naumann, & Soto, 2008; Lee & Ashton, 2008; McCrae & Costa, 2008; Zuroff, 1986) posit that individuals reliably differ in their thoughts, feelings, motivations, and behavior across time and situations, and that such reliable differences are due to their underlying personality traits. Perhaps the most well-developed current trait theory is Five-Factor Theory (FFT: McCrae & Costa, 2008). As such, we will focus our discussion of the present work in terms of predictions from FFT; however, many of the predictions from FFT would be similar to those made by other trait theories (e.g., rank-order consistency, links to life outcomes). There is ample empirical support for trait theories of personality, including many of the postulates outlined by FFT. Personality traits are demonstrably (a) relatively stable across situations and time (Fleeson & Nofhle, 2008) and (b) linked to a wide-variety of behaviors and life outcomes (Ozer & Benet-Martínez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Although FFT largely emphasizes and discusses the role of traits in behavior, situations are posited to be directly linked to behavior as well (see McCrae & Costa, 2008, Figure 5.1).

Cognitive-Affective Processing Systems (CAPS). The Cognitive-Affective Processing System model (CAPS: Mischel, 1973; Mischel & Shoda, 1995; 2008) is one prominent theory of personality belonging to a larger group of cognitive theories of personality (Cervone, 2004; Kelly, 1963; Read et al., 2010; Rotter, 1966). The CAPS model posits that a variety of cognitive and affective units explain individual differences in situation-based behavioral contingencies. Essentially, a person's behavior is dependent upon how his or her personality system processes the situation characteristics that he or she is experiencing. Thus, personality is a mediator of the relationship between situation characteristics and behavior. On one hand, the literature contains a sizeable amount of empirical support for the CAPS model. For example, if-then patterns of behavior (i.e., situation-based contingencies) exhibit some stability across time (Fournier, Moskowitz, & Zuroff, 2009; Smith, Shoda, Cumming, & Smoll, 2009) and seem to be associated with cognitive structures (e.g., Pauletti, Cooper, & Perry, 2014). On the other hand, however, the utility of the CAPS model is still hampered by the fact that no general taxonomy of cognitive-affective processes that make up the personality system has been yet identified or described.

Trait Activation Theory. Trait Activation Theory (TAT: Tett & Gutterman, 2000) posits that “*the behavioral expression of a trait requires arousal of that trait by trait-relevant situational cues*” (p. 398, emphasis in original; see also Tett & Burnett, 2003). In other words, TAT suggests that situation characteristics serve as moderators of the relationship between personality traits and behavior.² For example, TAT predicts that “aggressive behavior is generally expected as a response to aggression-inducing stimuli, but people high in aggression will show a quicker or heightened response or greater sensitivity to weaker cues” (Tett & Gutterman, 2000, p. 398). Thus, while TAT recognizes the existence of main effects of traits and situations on behavior, it posits that much of behavior is explained by the interaction (Lievens,

De Koster, & Schollaert, 2008; Tett & Burnett, 2003). Alternatively one could state that, like the CAPS model, TAT posits the existence of situation-based behavioral contingencies (i.e., situation effects). Further, like FFT, TAT posits individual differences in overall levels of behavior. However, unlike the CAPS model or FFT, TAT also posits that individual differences in situation-based contingencies can be predicted by personality traits (i.e., a person \times situation interaction).

There is some empirical support for TAT. One study demonstrated that the correlations between self-reported trait levels and behavioral intentions in hypothetical situations were higher for those situations that were relevant for a particular trait (Tett & Gutterman, 2000). Another study demonstrated more convergence (agreement) in assessment center ratings of targets when the trait being judged was considered relevant to the task being performed (Haaland & Christiansen, 2002). Finally, a third study, combining multi-trait multi-method matrices from assessment centers, showed that convergent validity correlations were higher among exercises designed to observe behavior related to a relevant trait (Lievens, Chasteen, Day, & Christiansen, 2006). However, it is worth noting that the aforementioned studies did not test for person \times situation interactions *per se*, as outlined by TAT.

Whole Trait Theory. Whole Trait Theory (WTT: Fleeson, 2012; Fleeson & Jayawickreme, in press) is an attempt to integrate trait perspectives on personality (e.g., Costa & McCrae, 1992; DeYoung et al., 2007; John et al., 2008; Lee & Ashton, 2008) with social-cognitive perspectives (e.g., Kelly, 1963; Mischel & Shoda, 1995; Read et al., 2010; Rotter, 1966). Specifically, WTT posits that an individual's behavior (or other state expressions such as affect or cognition) can be conceptualized and quantified by a density distribution. Further, the central tendency (mean) of such a density distribution, or one's average behavior across

situations, corresponds roughly to one's trait level (as measured by personality tests). Lastly, behavioral deviations from one's central tendency can be explained by situation-based contingencies. Thus, WTT embraces the important role of cognitive-affective units in behavior, but at the same time also recognizes individual differences in typical state expressions (Fleeson, 2012; Fleeson & Jayawickreme, in press).

There is a sizeable amount of empirical support for WTT. Epstein (1979) demonstrated that personality traits are more closely associated with average levels of behavior across time than single instances of behavior. Further, several studies have now demonstrated that momentary expressions of personality form density distributions centered around trait levels (Ching et al., 2014; Church et al., 2013; Fleeson, 2001, 2007; Fleeson & Gallagher, 2009; Judge, Simon, Hurst, & Kelley, 2014). A particular strength of these studies was the use of experience sampling methods, which are less prone to memory errors that can occur when using retrospective self-reports (Shiffman, Stone, & Hufford, 2008), to assess how people were behaving in the moment. Further, two of these studies also demonstrated that deviations from density distribution means were predicted by situation-contingent stimuli. Specifically, Fleeson's (2007) study showed that situational contingencies for task orientation—a composite of obligation, imposition, deadline nearness, and the dullness of the situation—strongly predicted state expressions of conscientiousness (see Fleeson, 2007, Table 2). In addition, Judge et al.'s (2014) study showed that deviations from central tendencies were predicted by internal processes (e.g., motivation) and situational experiences (e.g., interpersonal conflict with co-workers).

Situations

An important component of all of the aforementioned theoretical perspectives is the situation. FFT suggests that situations directly influence behavior. The CAPS model stipulates

that personality (cognitive-affective units) mediates the effect of situations on behavior. TAT suggests that situations moderate the effect of personality traits on state expressions. And WTT posits that situations account for state expressions that deviate from one's central tendency (trait-level). Despite the importance of situations to these very diverse perspectives on personality, none offer any theoretically or empirically derived taxonomy of situation characteristics. Trait theories, despite their recognition of the importance of situations, largely ignore the questions of what is meant by situations and how they influence behavior. Likewise, the CAPS model often identifies situation characteristics simply as "Feature a, b, c, etc." (Mischel & Shoda, 1995, p. 254), but it remains unknown what these features represent. And, while situation relevance ratings used in TAT studies draw from personality psychology's Big Five (e.g., Haaland & Christiansen, 2002), there is no compelling empirical reason to believe that situations map onto a Big Five structure (cf. Rauthmann, 2012). Further, those studies that directly measured real-world situation characteristics relied on no particular theoretical perspective and did so in a rather *ad hoc* fashion (Fleeson, 2007; Judge et al., 2014).

This state of affairs is not surprising. For decades psychologists have lamented the fact that no taxonomy of important situation characteristics has been identified and widely used (Argyle, Furnham, & Graham, 1981; Endler, 1993; Frederiksen, 1972; Hogan, 2009; Reis, 2008; Saucier, Bel-Bahar, & Fernandez, 2007; Yang, Read, & Miller, 2006, 2009). Although numerous efforts have been made to develop situational taxonomies (e.g., Edwards & Templeton, 2005; Endler, Hunt, & Rosenstein, 1962; Kelley, Holmes, Kerr, Reis, Rusbult, & van Lange, 2003; Krahe, 1986; Magnusson, 1971; Van Heck, 1984; Vansteelandt & Van Mechelen, 2004; Yang et al., 2006), these efforts were largely focused on situation *classes*, or types, of situations (see Rauthmann, in press; Rauthmann, Sherman, & Funder, forthcoming). However, a better

understanding of situations and their effects might be gleaned by focusing on situation characteristics (Rauthmann et al., 2014) as the psychologically important meanings of situations or their descriptive attributes (de Raad, 2004; Edwards & Templeton, 2005). In addition, previous efforts to taxonomize situations rarely yielded measures that would (a) be useful for a wide variety of everyday situations and (b) allow for the quantification of similarity and differences among situations (see Sherman, Nave, & Funder, 2010). Thus, for researchers attempting to study the effects of situations on behavior or state expressions, it has been unclear how situations should be conceptualized or measured.

One effort to rectify this problem led to the development of the Riverside Situational Q-sort (RSQ; Wagerman & Funder, 2009; see also Sherman et al., 2010). The RSQ (Version 3.15; see Funder, Guillaume, Kumagai, Kawamoto, & Sato, 2012) contains 89 situation characteristics and has been recognized as the most widely available measure of situations (Rauthmann et al., 2014). Moreover, when the dimensional structure of the RSQ was examined in a sample of over 1,500 participants from 5 different countries, 8 robust dimensions of situation characteristics were identified. The Situational Eight DIAMONDS are Duty (*Does something need to be done?*), Intellect (*Is deep thinking required or desired?*), Adversity (*Are there external threats?*), Mating (*Is the situation sexually and/or romantically charged?*), pOsitivity (*Is the situation enjoyable?*), Negativity (*Does the situation elicit unpleasant feelings?*), Deception (*Is someone being untruthful or dishonest?*), and Sociality (*Are social interaction and relationship formation possible, required, or desired?*). A single-item measure for each of the DIAMONDS dimensions has also been developed (Rauthmann & Sherman, in press a).

Although the DIAMONDS characteristics have been empirically identified, and measures of these dimensions are now available, the relationship between the DIAMONDS characteristics

and real-world instances of behavior/emotions has not been examined so far. Rauthmann and colleagues (2014) showed that retrospective self-reports of DIAMONDS characteristics were related to aggregated, retrospective self-reports of behavior. Of course, because of their reliance on memory, such retrospective self-reports are subject to several biases (see Shiffman et al., 2008). A better understanding of the relationships between the DIAMONDS dimensions and state expressions could be gleaned from momentary ecological assessment methods (Furr, 2009; Mehl & Conner, 2012), such as experience sampling. Moreover, the data used by Rauthmann and colleagues were limited to just three or four situations per person. Thus, to truly establish the DIAMONDS characteristics as predictors of real-world behavior and emotions, an ideal data set would include real-time reports of both the DIAMONDS characteristics and behavior across many different situations people experience in their daily lives.

Current Study

As outlined thus far, prominent personality theories (FFT, CAPS, TAT, WTT) (a) rely on different assumptions about how situations influence behavior and (b) make partially competing predictions on how personality and situations should bring forth behavior. As such, the current study draws from an ambulatory assessment project aimed at understanding the links between personality traits, situation characteristics, and behavior. We employed a multi-method, intensive longitudinal sampling design where different personality traits and situation characteristics dimensions were assessed. At the trait level, this project includes measures of the HEXACO dimensions (Ashton & Lee, 2007; Lee & Ashton, 2008) and Subjective Happiness (Lyubomirsky & Lepper, 1999). At the ambulatory assessment (i.e., state) level, it includes experienced DIAMONDS situation characteristics (Rauthmann & Sherman, in press a) and nine real-time expressions of personality (i.e., behavior and emotions). Thus, this project takes advantage of

recent advances in both situation assessment (i.e., the DIAMONDS characteristics) and experience sampling methods to examine the impact of personality and situation characteristics on real-time expressions of personality (i.e., behavior and emotions). Although other studies may result from the data gathered in this project, the present study was designed with four research questions in mind.

Question 1: How much variability in state expressions is between vs. within persons?

Trait theories of personality (e.g., Costa & McCrae, 1992; DeYoung et al., 2007; John et al., 2008; Lee & Ashton, 2008) hold that variability in behavior is due, at least in part, to inter-individual differences, namely personality traits. In other words, the trait approach predicts that behavior should be roughly similar so long as the same person is enacting the behavior, across both time and situations (i.e., rank-order consistency). There is ample empirical evidence supporting rank-order consistency in behavior (e.g., Epstein, 1979; Fleeson, 2001, 2007; Funder & Colvin, 1991; Sherman et al., 2010), and we expected to find similar support here. That is, there should be variability in trait expressions due to between-person processes. Like trait theories, WTT (Fleeson, 2012; Fleeson & Jayawickreme, in press) also predicts that variability in behavior is due to between-person factors. However, WTT also posits the existence of substantial within-person variability in behavior, and there is ample empirical evidence to support this (Ching et al., 2014; Church et al., 2013; Fleeson, 2001, 2007; Fleeson & Gallagher, 2009; Judge et al., 2014). As such, we also expected to find variability in trait expressions due to within-person processes. Indeed, in a meta-analysis of 15 experience sampling studies, Fleeson and Gallagher (2009) found that approximately 35% of variation in behavior was between persons, while 65% of variance was within persons. Thus, this first research question can be

considered a replication of these findings in a new sample from a different population. However, answering this research question is a necessary first step to examining the subsequent questions.

Question 2: How much variability in situation experiences is between vs. within persons?

Because situations are posited to play an important role in behavior (Lewin, 1951), it is important to understand the sources of variability in situation experience. Do people experience situations that are roughly consistent over time? Or do the situations that people experience fluctuate widely over time? This research question is almost completely unexplored as of yet. Fleeson (2007) demonstrated that situation characteristics show within-person variation, but these characteristics were sampled in an *ad hoc* fashion as no taxonomy of situation characteristics was available to rely on at that time. The DIAMONDS dimensions have not yet been measured intensively in real-time in daily life. Theory on situation selection (Ickes, Snyder, & Garcia, 1997) suggests that people have some influence, although perhaps not conscious or intentional, over the situations they find themselves in. And empirically, people do experience some consistency in the situations they experience across time (Sherman et al., 2010). Thus, it is still reasonable to expect some degree of consistency in situation experiences across time (i.e., between-person variance). On the other hand, given the findings of Fleeson (2007), it is also reasonable to expect sizeable within-person variation in situation experiences. Regardless, describing the sources of variability in situation experiences is important for understanding the relative influences of personality and situations on behavior. If variability in situation experience is largely a between-person phenomenon, then one can examine, for example, the ways in which situation experience may be related to personality traits, or perhaps even mediate trait effects on behavior.

Question 3: How are personality traits related to situation experiences?

If there is between-person variability in situation experiences, it makes sense to investigate possible explanations of such variation in situation experience. Prior theorizing suggests that personality may be related to situation experiences in multiple ways (Allport, 1961; Bandura, 1978; Buss, 1987; Emmons, Diener, & Larsen, 1986; Ickes, et al., 1997). Perhaps the two broadest ways in which personality traits may be related to situation experience is through the processes of *selection* and *construal* (Rauthmann, Sherman, Nave, & Funder, in revision). Selection implies that one's personality traits are, intentionally or unintentionally, associated with objective (or at least consensual) situation characteristics. For example, we might predict that persons high on trait Honesty/Humility would be less likely to find themselves in deceptive situations. Construal implies that one's personality traits are associated with distinctive, subjective interpretations of situation characteristics. For example, we might predict that persons high on trait Honesty/Humility would be less likely to perceive situations as deceptive, regardless of the situation's actual level of deceptiveness. There is some empirical support for both selection and construal as processes by which personality traits are related to situation experiences (see Rauthmann et al., in revision). However, the evidence connecting traits to selection of everyday situations is rather limited (e.g., Emmons et al., 1986). Recent research on construal of situation characteristics has demonstrated that personality is related to construal of situations in both real-world (Sherman et al., 2013) and laboratory settings (Serfass & Sherman, 2013).

Separating situation selection from construal is no easy matter because self-reports of situation experiences necessarily confound the two. When third-party reports of situations are available though, the effects of situation selection and construal can be examined separately by statistically partialling out overlap between self-reports and third-party reports (e.g., Rauthmann

et al., in revision; Sherman et al., 2013; Serfass & Sherman, 2013). Without the availability of such third-party reports, however, it is not possible to separate situation experience into selection and construal components. While the present research gathers real-time situation experiences, it only does so via self-report, making it impossible to separate selection and construal in these data. Nonetheless, the association between personality traits and situation experiences – which can include selection and/or construal – is still of interest. Because the DIAMONDS characteristics can be closely mapped onto the HEXACO personality traits, a number of predictions can be made. In particular we expected that trait Honesty/Humility should predict experiencing less situational Deception, trait Emotionality should predict experiencing more situational Negativity, trait eXtraversion should predict experiencing more situational Sociality, trait Agreeableness should predict experiencing more situational pOsitivity and less Deception, trait Conscientiousness should predict experiencing more situational Duty, and trait Openness to Experience should predict experiencing more situational Intellect. In addition, we expected that trait Happiness would predict experiencing more situation pOsitivity.

Question 4: How are person and situation characteristics related to state expressions?

The fourth research question is central to personality and social psychology. Persons and situations have long been posited as important for behavior (Lewin 1951; Funder, 2006). However, simultaneously measuring the joint influences of personality and situations on behavior in real-time has been rare (cf. Fleeson, 2007).³ This research question can be seen as an extension of Fleeson's work by examining the relationships between an empirically derived set of situation characteristics (the DIAMONDS characteristics) and behavior. Research thus far connecting the DIAMONDS to behavior has relied entirely on retrospective self-reports

(Rauthmann et al., in press). If both persons and situations importantly and simultaneously predict real-world behavior, we should detect such associations in the present study.

What sort of associations can be expected between personality traits, DIAMONDS characteristics, and state expressions? Prior research has demonstrated that the Big Five personality traits predict momentary expressions of Big Five behavior (Ching et al., 2014; Church et al., 2013; Fleeson, 2001, 2007; Judge et al., 2014). The links between personality traits and state expressions are straightforward: trait Honesty/Humility should predict momentary expressions of honesty/humility; trait eXtraversion should predict momentary expressions of sociability, and so on. Table 1 displays the full set of momentary state expressions measured (left column) and the corresponding personality trait (middle column) expected to be associated with such expressions.

Although there are no empirical data assessing the associations between the DIAMONDS characteristics and real-time state expressions, we used both common sense and prior experience working with the DIAMONDS characteristics (Rauthmann et al., in press; Rauthmann & Sherman, in press a, b) to make predictions about which DIAMONDS characteristics should be related to each state expression. Because the DIAMONDS dimensions can be closely mapped onto the HEXACO model of personality, many predictions about how the DIAMONDS situation characteristics are related to trait expressions are straightforward. In situations characterized by *Duty*, people should behave more conscientiously. In situations that are high in *Intellect*, people should express more openness to experience. The full set of predictions is provided in Table 1.

– Table 1 –

As can be seen, these predictions overlap quite a bit with our expectations for the relationships between global traits and situation experience outlined previously, so we will not

repeat them here. Instead, we only note the rationale for a few predictions that are less straightforward. First, we speculated that people in adverse situations may act more dominant in an effort to regain control over the situation. Second, we did not have strong predictions about how Mating would be associated with the state expressions measured in this study. However, drawing on hypotheses from evolutionary psychology and/or gender roles (Buss & Schmitt, 1993; Eagly, 1987), we speculated that mating situations might promote agreeableness behavior in females and dominance behavior in males. Third, we were largely unsure about what DIAMONDS characteristics might be most associated with state expressions of Agreeableness. On the one hand, people may act more agreeable in situations characterized by Sociality, and on the other hand, pOsitivity may yield more agreeable behavior. We also considered the notion that people might express less agreeableness in situations that are high in Deception as a sort of protective mechanism (i.e., protecting oneself from being taken advantage of). Thus, it is worth noting that while we were in consensus about which DIAMONDS characteristics would be associated with each state expression shown in Table 1, we were unsure about what to expect for Agreeableness.

Finally, this fourth research question also examines potential person \times situation interaction effects on real-time state expressions. Specifically, TAT (Tett & Gutterman, 2000; Tett & Burnett, 2003) predicts, for example, that trait levels of Honesty/Humility will be more associated with honest/humble behavior in situations that are high in Deception. Thus, the effect of personality traits on behavior may be moderated by the situation, or alternatively, the effect of the situation on behavior may be moderated by personality traits. This study seeks to provide further empirical tests of TAT by explicitly examining trait \times situation characteristics interactions as outlined in Table 1.

Method

Participants

Two-hundred eighteen undergraduates at Florida Atlantic University participated in this study for partial course credit.⁴ Eight participants only completed the first session of the study and therefore their data could not be used here. Personality data (Session 1) for one participant was lost due to a computer error; however, experience sampling data from this participant was used wherever possible. Thus, analyses reported here pertain to 210 (136 female, 73 male, 1 unknown) or 209 participants. The age range for these participants was 18 to 36 years old ($M = 18.61$, $SD = 1.78$). The ethnic breakdown for these participants was 18.2% African American, 1.4% Asian, 47.4% Caucasian, 23.0 % Hispanic/Latino, 7.6% Other, and 2.4% did not indicate or were unknown.

Procedure

Participants arrived at the laboratory individually and were greeted by a research assistant. The research assistant explained that the goal of the study was to “understand the situations that you experience in a typical week as well as how you feel, think, and behave in these situations.” Participants were informed that the study included two parts. The first part consisted of a brief (approx. 5 min) video-recorded interview⁵ and a number of personality measures (see *Personality Measures*) using a computerized testing format. For the second part of the study, participants were sent a text message eight times per day over the course of seven consecutive days containing a personalized link to a survey about their current situation and state expressions (behavior/emotions; see *Experience Sampling Measures*). Because this study required text messaging capabilities and internet access on a mobile device (i.e., a smart phone), only participants who had such devices were permitted to complete the second part of the study.

All participants had such capabilities, but the eight participants who did not complete the second portion of the study indicated they had technical problems.

The text-messaging portion of the study began on the day immediately following the first laboratory visit. Although participants could begin the study on any weekday (M-F), the text-messaging schedule was fixed across the seven days of the week for all participants. For example, all participants received text messages at the same time of day on the Monday (Tuesday, Wednesday, etc.) that they were in the study. The text times for each day were randomly generated by choosing eight times between the hours of 9 am and 11 pm. Because we wanted to have at least 1-hr gaps between reports, a new set of times was randomly selected if any times fell within 1-hr of each other. The full text-messaging schedule is available in supplemental materials.

Personality Measures

HEXACO-60. The HEXACO-60 (Ashton & Lee, 2009) is a 60-item measure of six major dimensions of personality. Participants rated themselves on these items using a 1 (*strongly disagree*) to 5 (*strongly agree*) Likert-type rating scale. Composites were formed by averaging the ratings for items on each of the six dimensions. Descriptive statistics are reported in Table 2.

– Table 2 –

Subjective Happiness. The Subjective Happiness Scale (SHS: Lyubomirsky & Lepper, 1999) is a 4-item measure of trait-level happiness. Participants rated themselves on these items using a 1 to 7 Likert-type rating scale (e.g., “In general, I consider myself: 1 [not a very happy person], 7 [a very happy person]). A composite happiness score was formed by averaging the ratings on these items after reverse scoring the negatively keyed fourth item. Descriptive statistics are reported in Table 2.

Other Measures. Because this data collection is part of a large dataset on personality, situations, and behavior, some measures collected during the first session were not used in the analyses reported here. These include the California Adult Q-set (Block, 1961), the Inventory of Individual Differences in the Lexicon (Wood, Nye, & Saucier, 2010), and a measure of the participant's life situation developed by us specifically for a different aspect of this research (more details about this measure can be obtained from the first author).

Experience Sampling Measures

S8-I. The S8-I (Rauthmann & Sherman, in press a) measures the eight major characteristics found in the RSQ-8 (Rauthmann et al., 2014) with a single item for each characteristic. This measure is ideal for experience sampling designs because it minimizes participant burden. Participants were instructed to rate the situation they were in when texted using the following items: Duty – “Work has to be done,” Intellect – “Deep thinking is required,” Adversity – “Someone is being threatened, blamed, or criticized,” Mating – “Potential romantic partners are present,” Positivity – “Situation is enjoyable,” Negativity – “Situation includes negative feelings (e.g., stress, anxiety, guilt),” Deception – “Someone is being deceived,” and Sociality – “Social interaction is possible or required.” Items were rated on a 1 (*extremely uncharacteristic*) to 7 (*extremely characteristic*) Likert-type scale. The items were presented together on a single page, and item order was randomized each time the survey was taken.

State Expressions. To measure *in situ* expressions of personality, we asked participants to rate their behavior and feelings using ten bipolar rating scales each pertaining to different personality constructs inspired by Fleeson (2007) as well as Denissen, Geenen, et al. (2008). For eight of the items a 1 to 7 Likert-type bipolar rating scale with two adjectives as anchors were used: Honesty/Humility (*humble, honest—arrogant, dishonest*), Emotionality (*nervous,*

emotional—calm, unemotional), Sociability (*outgoing, sociable—reserved, quiet*), Dominance (*dominant, assertive—submissive, unassertive*), Agreeableness (*warm, agreeable—cold, quarrelsome*), Conscientiousness (*organized, hardworking—disorganized, lazy*), Openness/Intellect (*intelligent, creative—unintelligent, uncreative*), and Happiness (*happy, positive—sad, negative*). Note that we used two items for extraversion, one tapping its social component and another tapping its dominance component. The remaining two items also used a seven-point scale with the following anchors: Self-esteem (*feeling good about myself—feeling bad about myself*) and Authenticity (*authentic [true to myself]—inauthentic [not true to myself]*). The latter item was included for research purposes examining different hypotheses and was not analyzed for this paper. The items were presented together on a single page, and item order was randomized each time the survey was taken.

Preprocessing of Experience Sampling Data

With 210 participants each receiving 8 text messages over the course of 7 consecutive days, the total number of possible responses was 11,760. In total, participants completed 9,753 reports (82.9%) which is 46.44 reports per participant ($SD = 9.61$, median = 49, min = 2, max = 65).⁶ However, to ensure the validity of these reports, we removed all reports that were not completed within 1-hr of the time the text message was sent to participants prior to data analysis. Eliminating these reports left the total number of reports completed at 8,318 (70.7%) which is 39.61 reports per participant ($SD = 9.67$, median = 41, min = 1, maximum = 55). Such preprocessing is consistent with similar research using experience sampling methods (Fleeson, 2001, 2007; Fleeson & Gallagher, 2009; McCabe, Mack, & Fleeson, 2012).

Results⁷

Question 1: Sources of State Expressions

Because data were nested within participants, all analyses employed multilevel modeling with participants as the nested factor using the lme4 package (Bates, Maechler, Bolker, & Walker, 2014) in R (R Core Team, 2014). To address the first research question—how much variability in state expressions is between versus within persons—we estimated unconditional cell means models (Cohen, Cohen, West, & Aiken, 2003) for each personality state expression. The variance components, intra-class correlations (ICCs), intercepts, and number of observations for each of these analyses are displayed in the upper-portion of Table 3. Of interest, all state expressions displayed sizeable between-person variances (τ_{00} ; $M = 1.12$, $SD = .10$), with somewhat larger within-person variances (σ ; $M = 1.99$, $SD = .47$). Further, the ICCs ranged from .29 to .46 ($M = .36$), indicating sizeable consistencies in state expressions across situations experienced. Thus, these results replicate Fleeson's (2001, 2007) findings in that there is sizeable variation both between and within participants in state expressions. The intercepts in Table 3 also provide descriptive information about how participants generally behaved across all situations: Emotionality was relatively low, but most (average) state expressions hovered around the scale midpoint.

– Table 3 –

Question 2: Sources of Situation Experiences

To address the second research question—how much variability in situation experiences is between versus within persons—we estimated a similar set of unconditional cell means models for each DIAMONDS characteristic experienced. The variance components, intra-class correlations (ICCs), intercepts, and number of observations for each of these analyses are displayed in the lower-portion of Table 3. All situation characteristics displayed sizeable between-person variances (τ_{00} ; $M = .95$, $SD = .22$), but even larger within-person variances (σ ; M

= 2.94, $SD = 1.19$). The ICCs ranged from .17 to .36 ($M = .26$) indicating that people's reported situation experiences were moderately consistent over time. Overall, these findings indicate that, while certain individuals were more likely to experience certain kinds of situation characteristics on average, much of the variation in situation characteristic experiences was within persons. The intercepts in Table 3 also provide some indication of what the typical situation experienced by participants was like: Deception and Adversity were rare (near the bottom of the scale), while Positivity, Duty, and Sociality were more common (near the midpoint of the scale). Notably, the ICCs for situation experiences were on average .10 lower than the ICCs for state expressions. The implications for this finding are detailed in the Discussion section.

Question 3: Associations between Personality Traits and Situation Experiences

To examine the associations between personality traits and situation experiences, we estimated so-called “means-as-outcomes” regression models (Cohen et al., 2003) wherein scores on each DIAMONDS characteristic were predicted by the personality trait thought to be associated with that situation characteristic (see Table 1). The results for each model are displayed in Table 4. To clarify those results shown in Table 4, we detail the results of the first model, predicting experience of situational Deception from trait Honesty/Humility here.

– Table 4 –

The fixed (average) intercept for Deception in the sample was 1.68 with a standard deviation of .77, indicating that while on average Deception experience was low (1.68 on a 7-point scale) there were individual differences in the amount of Deception experienced. Trait Honesty/Humility predicted such individual differences in the amount of Deception experienced with a slope of -.39, which was statistically significant by conventional standards ($t = -3.94$). This means that for every 1-point increase in Honesty/Humility, we would expect a .39 decrease

in the average level of Deception experienced for that person. Despite this relationship, there is still sizeable prediction error with a *SD* in the residuals of 1.05. Confidence intervals for each of these model parameters (*bs* and *SDs*) were generated from $K = 500$ bootstrapped resamples. Finally, two indices of model fit are reported in Table 4. The first value (R_m) is the marginal *R* of the model, which can be interpreted as the model fit for only the fixed effects of the model. The second value (R_c) is the conditional *R* of the model, which can be interpreted as the overall model fit (Nakagawa & Schielzeth, 2013).

Overall, the pattern of results in Table 4 suggests that personality traits are at least partially associated with the situations participants later reported experiencing in theoretically sensible ways. That is, people scoring higher on Honesty/Humility were less likely to experience situations that were high in Deception, those high in Emotionality were more likely to experience situations high in Negativity, those high in Extraversion were more likely to experience situations high in Sociality, those high in Agreeableness were more likely to experience situations high in pOsitivity and low in Deception, those high in Conscientiousness were more likely to experience situations high in Duty, those high in Openness were more likely to experience situations high in Intellect, and those high in Happiness were more likely to experience situations high in pOsitivity. It is worth noting that some of these findings were not statistically significant by traditional standards (e.g., Openness and Intellect); however, all were in the predicted direction. Nonetheless, it is also important to note that the associations between personality traits and situation experiences were rather small on average (mean $R_c = .09$) and did not exceed $R = .16$. This indicates that although traits were associated with situation experiences, these associations were small. The implications for these findings can be found in the Discussion section.

Question 4: Predicting State Expressions from Personality Traits and Situation

Experiences

With preliminary research questions addressed, we now turn to the central question of this research: How are person and situation characteristics related to state expressions? To address this question, we developed predictive models for each of the state expressions based on those outlined in Table 1. It is important to note that situation characteristics could be related to state expression in two different ways. First, using the situation characteristic Deception as an example, someone who experienced higher levels of such a situation characteristic on average across their week could be expected to show less Honesty/Humility on average. Thus, between-person differences in Deception experience could impact behavior. Indeed, the results reported in Table 3 indicate that there were, in fact, between-person differences in situation experiences. Second, deviations from one's average level of situation Deception experienced could also be related to deviations from one's average level of Honesty/Humility expression. Thus, within-person differences in Deception experience could also impact behavior. Indeed, such within-person situation-behavior contingencies are an essential part of the CAPS model (Mischel & Shoda, 1995; Fleeson, 2007; Fournier et al., 2009; Smith et al., 2009).

To account for both of these possibilities, all situation characteristics were within-person centered and each person's average situation characteristic experience was entered as a level 2 predictor. The descriptive statistics for average situation characteristics experienced and their associations with other level 2 variables are reported in Table 2. To maintain interpretability of the intercepts, all level 2 predictors (i.e., both traits and average situation experiences) were grand mean centered. Thus, for each state expression listed in Table 1, the typical initial model included three simultaneous predictors: (1) the relevant personality trait (level 2, grand mean

centered), (2) the mean level of the relevant situation characteristic experienced (level 2, grand mean centered), and (3) the relevant situation characteristic experienced (level 1, within-person centered). The effects of personality traits and mean situation experiences were estimated as fixed effects (i.e., not allowed to vary across people), while the effects of situation characteristics were estimated as random effects (i.e., allowed to vary across people). Such an analytic approach allows us to simultaneously estimate the effects of personality traits, average levels of situation experience, and situation contingencies on behavior (Enders & Tofighi, 2007).

After first estimating the initial model just described for each state expression, a second model including the person \times situation interaction term(s) was estimated by multiplying the personality trait by the within-person centered situation characteristic(s) in Table 1. At this point, we examined the fixed effects regression coefficients and simplified the model to include only the original main effects and those interaction terms that added unique predictive value. Confidence intervals for all parameters were then computed on these finalized models. To make this process fully transparent, the R script in the supplemental materials shows all of the analyses conducted.

– Table 5 –

Table 5 reports the fixed effects estimates for each of the finalized models. To make this table concrete, we summarize the results for predicting real-time expressions of honest/humble behavior here. The first column of Table 5 shows the fixed regression coefficients, including the intercept (5.66) and slopes (.29 for trait Honesty/Humility; -.60 for between-person Deception experience, -.18 for within-person Deception experience, and -.12 for the interaction). Thus, for honest/humble behavior, we see that there are sizeable (and statistically significant) effects of trait level Honesty/Humility, between-person Deception experience, within-person Deception

experience, and the interaction between trait Honest/Humility and within-person Deception experience. However, the effect size for the interaction is small relative to the other effects. Confidence intervals were again generated using $K = 500$ bootstrapped resamples. The last two columns of Table 5 report the aforementioned marginal and conditional multiple R s for the model (Nakagawa & Schielzeth, 2013).

– Table 6 –

Table 6 shows the standard deviations for the intercepts (i.e., remaining variation between persons), the slopes (i.e., variation in the relationships between within-person Deception experience and honest/humble behavior), and the residuals (i.e., remaining variation within persons). Thus, after including the predictors identified in Table 5 in the model, the SD among intercepts in honest/humble behavior was .90. The SD in situational deception slopes (i.e., situation contingencies) was .22, and the remaining prediction errors had an SD of 1.08. Table 6 also reports the correlations among random effects. Sticking with the honesty/humility example, there was a correlation of $r = -.23$ between participant intercepts and slopes in the final model such that people who on average acted more honest/humble had steeper negative slopes (i.e., were more sensitive to changes situational Deception).

Across each of the nine state expressions, there are several patterns that should be noted. First, personality traits always emerged as sizeable predictors of the corresponding state expression (Table 5): Trait Emotionality predicted emotional behavior, trait Conscientiousness predicted conscientious behavior, and so on. Thus, these results are consistent with predictions from trait theories of personality (e.g., FFT) and WTT which both posit that global personality traits should predict average behavior (here: intercepts).

Second, between-person differences in situation experiences (i.e., mean situation levels) largely predicted individual differences in state expressions with a few notable exceptions (see Table 5): People who experienced more Deception on average reported less honest/humble behavior on average, people who experienced more Sociality on average reported more extraverted behavior on average, and so on. As exceptions, average levels of Adversity had little effect on average levels of emotionality expression, average levels of Sociality had little effect on average levels of agreeableness expression, average levels of Duty had little effect on average levels of conscientiousness expression, and average levels of Intellect had little effect on openness expression.

Third, within-person differences in situation experiences uniformly predicted within-person differences in state expressions (see Table 5). Figure 1 shows four representative spaghetti plots of the relationship between within-person centered situation characteristics and state expressions. When a person was in a situation that was higher in Deception than other situations that person experienced, the person acted less honest/humble than he or she typically might; when a person was in a situation that was higher in Sociality, the person acted more extraverted than he or she normally might; and so on. In other words, these data show clear evidence for situation-based contingencies in behavior as posited by the CAPS model and WTT.

– Figure 1 –

Fourth, there were sizeable individual differences in such situation-based contingencies (see Table 6; Figure 1). The standard deviations for situation-based contingencies ranged from .08 (Sociality predicting agreeable behavior) to .26 (Negativity predicting emotional behavior). From a multilevel model perspective, this means that there were small inter-individual differences in the slopes linking within-person situation variation to within-person state

expressions. However, the presence of individual differences in slopes does not mean that they are meaningful and not just statistical noise (i.e., that they are reliable). The reliability of these within-person contingencies can be estimated by dividing the variance in slopes from the multilevel models by the variance in slopes resulting from ordinary least squares regressions for each participant (i.e., $rel = \frac{\tau}{\sigma_{OLS\ Slopes}^2}$).⁸ The reliabilities are reported in the last column of Table 6. These reliabilities can be interpreted as the expected correlation among the slopes in these data and the slopes that would be obtained in a replication of this data set gathered on the same participants. As can be seen, the stability of individual differences in situation-based contingencies were quite varied, ranging from .02 (Sociality-agreeableness) to .62 (Duty-conscientiousness) with a mean of .31 ($SD = .21$). Thus, while some individual differences in situation-based contingencies were fairly stable, others were not.

Given that there is some stability in the situation-based contingencies, it makes sense to try to predict them. As a reminder, TAT posits that such contingencies are a function of personality traits themselves, such that situations moderate the effect of personality on state expressions (i.e., a person \times situation interaction). As noted earlier, such interactions as outlined in Table 1 were tested. However, the results indicated that such interactions were rarely statistically significant, and even worse, they were uniformly small in terms of effect size even if they did reach statistical significance. The only two person \times situation interaction effects that reached statistical significance were for Honesty/Humility and Deception predicting honest/humble behavior and for Extraversion and Sociality predicting extraverted behavior. However, in both of these cases the effect sizes were quite small ($bs = -.12$ and $-.07$, respectively). Thus, inconsistent with the predictions of TAT, personality traits could not explain variation in situation-based behavioral contingencies. Possible alternatives for explaining such

situation-based behavioral contingencies are provided in the Discussion section. Regardless, in the absence of interaction effects, personality traits and situational experiences independently predicted personality state expressions. These findings suggest an additive model of person and situation variables *both together, but independently* shaping behavioral expressions.

Discussion

This study was conducted with four research goals in mind: (1) examining within- and between-person variation in personality state expressions, (2) examining within- and between-person variation in situational characteristics experiences, (3) examining relationships between personality traits and situation experiences, and (4) predicting personality state expressions of behavior and emotions from personality traits and situational experiences. In what follows, we discuss the key findings from this study with respect to each of these research goals. We then discuss the theoretical implications for these results, consider the limitations of this work, and suggest possible future directions for better understanding the Personality Triad of persons, situations, and behavior (Funder, 2006, 2008, 2009).

Variation in State Expression

The first key finding of this research is that there was sizeable variation in state expressions (i.e., behavior and emotions), both between and within persons. This replicates previous work assessing between- and within-person variation in behavior (Ching et al., 2014; Church et al., 2013; Fleeson, 2001, 2007; Judge et al., 2014) in a new sample from a different population. In addition, these results extend previous findings to a sixth broad dimension of personality (honesty/humility) and to more nuanced dimensions of personality such as dominance, happiness, and self-esteem. Overall, the results are quite consistent with the view that although behavior varies across situations (both within and between persons), behavioral

consistency across situations is still sizeable with ICCs in this study ranging from .29 to .46 (Epstein, 1979; Funder & Colvin, 1991). In fact, the mean ICC in this study of .36 is remarkably similar to Fleeson and Gallagher's (2009) estimate of 35% of variation in behavior due to between-person factors.

Variation in Situation Experiences

The second key finding of this research is that there were sizeable variations in situation experiences both between and within persons. This is a novel finding because, until recently, few measures of situations (or rather, their psychologically relevant characteristics) existed, and this is the first study to examine the DIAMONDS characteristics in an intensive sampling design. Interestingly, the amount of within-person variation in situation experiences was much larger than the between-person variation (Table 3). As such, individual differences in situation experiences were less consistent than individual differences in state expressions (ICCs ranging from .17 to .36). This finding has several implications. First, it implies the existence of stable personality traits. If one's behavior is more consistent than the situations one experiences, then this suggests that something other than situations must contribute to behavioral consistency.⁹ Personality seems to be the most likely culprit. Second, this finding suggests that persons may have more influence (or perhaps control) over their own state expressions (behavior) than they do over the situations they experience. Or put another way, personality plays less of a role in the situations people experience than it does in people's actions in those situations. However, this should not be interpreted to imply that people have no control over their situations. Stable individual differences in situation experiences were present (average ICC = .26), suggesting that personality could play a role in situation experience (e.g., via selection or construal).

Personality and Situation Experience

The third key finding of this research builds directly from the second key finding: stable individual differences in situation experiences were predictable from personality traits. Characteristically honest/humble people were less likely to report experiencing situations that were high in Deception, happy people were more likely to report experiencing situations that were high in pOsitivity, etc. Despite this finding, it is important to note that these relationships were rather small, suggesting that personality traits only had a small role in daily situation experiences. Further, although these data are real-time assessments of situation characteristics, they are still self-reports and as such do not allow for determination of to what degree relationships between personality traits and situation experiences are due to selection versus construal processes. This is further discussed in the Limitations section.

The Joint Role of Personality Traits and Situation Characteristics

The major focus of this study was to examine the *joint role* of personality traits and situation characteristics on real-time expressions of personality (i.e., behavior and emotion). Across the nine personality state expressions measured, the pattern of results was remarkably consistent. Both personality traits and situation characteristics *independently* predicted real-time state expressions. The study design and analytic strategy (i.e., within-person centering of situation characteristics) permitted an even clearer understanding of the roles of traits and situations on behavior. Specifically, both personality traits and individual differences in average situation experiences predicted mean differences in personality state expressions. At the same time, within-person differences in situation experiences predicted within-person differences in state expressions.

Interestingly, and despite the oft-noted importance of person \times situation interactions, this study found very little support for interactions between personality traits and situation

characteristics as useful predictors of real-time state expressions. Even in those analyses where person \times situation interactions were statistically significant predictors, their effect sizes were relatively small (particularly as compared to the main effects). Overall then, these data suggest an additive person-environment transaction model: both people's enduring personality traits and their momentary situational experiences *independently* shape their behavior at a given moment.

Theoretical Implications

In the Introduction we identified four theoretical perspectives speaking to the interaction between persons, situations, and behaviors: FFT, CAPS, TAT, and WTT. The data reported in this study have implications for each of these theoretical perspectives.

Trait Theories. The data reported here have two implications for trait theories of personality (e.g., FFT; McCrae & Costa, 2008). First, we found support for the prediction from FFT that (a) behavior is somewhat stable across time and contexts and (b) that personality traits predict behavior across both time and contexts. These results are quite consistent with nearly every trait theory of personality (e.g., Allport, 1937; Buss & Craik, 1983; DeYoung et al., 2007; John et al., 2008; Lee & Ashton, 2008) and are not necessarily surprising as the empirical evidence for this prediction is now quite large. Second, the results of this study point to the DIAMONDS dimensions as a potentially useful set of "External Influences" (McCrae & Costa, 2008, Figure 5.1) on behavior and characteristic adaptations. If trait theories intend to predict more than individual differences in general tendencies, then incorporating the role situations and their characteristics play in the outputs of traits (i.e., their behavioral manifestations) will be necessary (e.g., WTT).

CAPS. The data reported here have numerous implications for the CAPS model of personality (Mischel, 1973; Mischel & Shoda, 1995, 2008) as well. First, we found support for

the existence and importance of situation-based contingencies on behavior. Specifically, the DIAMONDS characteristics were useful in predicting theoretically relevant personality state expressions. This was particularly true at the within-person level, which is precisely where CAPS posits the existence of such contingencies. Second, we also found some support for the notion that these situation-based contingencies reliably vary between persons over time (i.e., some individual differences in situation-based behavioral contingencies were fairly stable). However, the stability of situation-based contingencies varied substantially between contingencies, with the average falling in the .30 range. This is perhaps to be expected as previous research has also shown stability estimates of behavioral signatures in this range (Fournier, Moskowitz, & Zuroff, 2008). Third, despite the presence of some stability in situation-based contingencies, personality traits did not predict individual differences in them. This is not necessarily a limitation of the CAPS model. Indeed, because the CAPS model tends to eschew personality traits, it is unlikely that any CAPS model theorist would predict that personality traits moderate such situation-based contingencies anyway. Instead, the CAPS model points to so-called cognitive-affective units as possible moderators of situation-based contingencies. Such units tend to be quite specific to the situation-behavior contingencies they are trying to predict. For example, one recent study (Pauletti et al., 2014) demonstrated that children with gender identity issues are more likely to behave aggressively towards children who remind them of their own gender identity issues (controlling for overall actor aggression and targets' tendency to be aggressed against).

Thus, to use one example from the present work, a set of cognitive-affective units thought to explain individual differences in the relationship between situational Duty and conscientious behavior would be useful. Unfortunately, at this early stage of development, no set of cognitive-

affective units thought to be related to DIAMONDS-based contingencies on behavior have been identified. In our view, this area is ripe for future research. One might wonder what sorts of cognitive structures could explain why some individuals behave more conscientiously in the face of increasing situational Duty, whereas others do not. Perhaps some individuals perceive increases in situational Duty as opportunities to get organized and accomplish something, whereas others may perceive such increases as work-overload and respond by shutting down and procrastinating. Thus, different implicit theories or beliefs (e.g., opportunity vs. obstacle thinking) and goal-sets (e.g., mastery goals, approach vs. avoidance motivation) may be able to explain such individual differences.

Finally, although the CAPS model has long posited the role of situations in the personality system, it has not identified any tractable set of situation characteristics relevant to the system. The data reported here suggest that the DIAMONDS characteristics might prove to be a useful place to begin investigations of situation-based contingencies and their cognitive-affective moderators. However, an important caveat here concerns the reliability/stability of situation-based contingencies.

TAT. The results of this study are inconsistent with the predictions of TAT (Tett & Gutterman, 2000). TAT predicts that the aforementioned individual differences in situation-based behavioral contingencies can be predicted by personality traits, or trait \times situation interactions. While two of the person \times situation interactions tested were statistically significant, the vast majority were not, and the effect sizes were uniformly small. Thus, we must conclude that these data do not support the predictions of TAT. In many respects, one could argue that TAT asks a lot out of the data in that it expects additional effects of traits and situations beyond the main effects of each. In our view, this suggests that variables esteemed by the cognitive

perspectives on personality – such as identities, goals, motivation, and other cognitions – may be better suited as explanations of situation-based contingencies on behavior. Finally, it is worth noting that the evidence for TAT comes largely from workplace settings (e.g., Lievens et al., 2006; Tett & Burnett, 2003) and the data presented here do not specifically speak to such settings.

WTT. The results of this study are closely aligned with the predictions of WTT (Fleeson, 2012; Fleeson & Jayawickreme, in press). Specifically, we found that central tendencies in personality state expressions were well predicted by personality traits. Further, we found that deviations from one's central tendencies were largely a function of situational factors (Fleeson & Gallagher, 2009). At the same time, these results may also improve WTT by providing it with a useful set of empirically derived situation characteristics. Integrating the DIAMONDS characteristics into WTT may further WTT's already promising integration of trait and cognitive perspectives on personality and situation-based contingencies.

Limitations

Like many studies in psychology, the generalizability of the presented results is limited due to the use of a convenient undergraduate psychology subject pool. In this case, the undergraduate subject pool provided cheap access to a large sample of adults who could complete the study. Indeed, one strength of this study compared to other ambulatory assessment studies (e.g., Fleeson, 2001, 2007; Church et al., 2013; Judge et al., 2014) is that the sample size was two to four times as large as most others. The costs of conducting this study with non-subject pool adults (e.g., a community sample) would likely be substantially higher (e.g., Judge et al., 2014). We suspect that if such data had been collected using a community sample, the relationships between personality, situations, and behavior identified therein would be largely

similar, but that is a question that can be empirically investigated in the future. It is also worth noting that the sample used here was more ethnically diverse than typical samples gathered from undergraduate subject pools. Nonetheless, future research should consider examining the joint role of personality traits and situations on real-time behavior in community samples.

Unfortunately, these data were also somewhat limited in that we could not separate situation selection (i.e., contact) from situation perception (i.e., construal). Earlier we showed that people reported experiencing similar situations over time (average ICC = .26) and that these stable individual differences were related to personality traits. However, because we only have participants' reports of their experienced situation characteristics, we cannot determine whether such reports reflect actual similarities among situations or individual differences in construal of situations (Rauthmann et al., forthcoming; Rauthmann et al., in revision). Thus, it is possible that participants did not actually experience similar situations (in an objective sense, cf. Furr & Funder, 2004), but simply perceived them to be similar. The empirical evidence on this matter, however, suggests that this possibility is quite low. Multiple studies have shown that the vast majority of the variance in situation ratings is due to the situation itself (i.e., consensual) rather than to idiosyncratic perceptions (Rauthmann, 2012; Serfass & Sherman, 2013; Sherman et al., 2010, 2013).

Alternatively, we could have had participants write brief descriptions of each situation they experienced for later coding (see Sherman, Nave, & Funder, 2013). However, in an effort to keep response times low (i.e., under 2 minutes) and thereby reduce participant burden, we chose not to gather such descriptions. Moreover, even if we had gathered such descriptions, they themselves may represent situations that are already construed (Serfass & Sherman, 2013; Sherman et al., 2013) and only contain pre-filtered situation cues (Rauthmann, in press). An ideal

study would provide a more objective window for third-party raters to view the situation participants actually encountered to separate situation selection from situation perception. Such a study is currently underway, but it may be several years before these data are available.

Finally, like most experience sampling studies, the data gathered here are limited to the range of situations people experienced in their daily lives over a relatively short time period (i.e., 1 week). Further, unlike as in experimental designs, individuals were not subject to the same set of situations. Of course, these limitations are balanced by the strengths of experience sampling studies: real-time assessment of real lives as they are lived.

Conclusions

One goal of psychology is the description and explanation of how human behavior and emotion manifest in everyday life (i.e., state expressions). This study provides direct empirical support for the often-noted idea that human behavior is a function of *both* person and situation characteristics (Funder, 2006; Lewin, 1951). As such, it advances our understanding of personality traits and situation characteristics. In terms of personality traits, the growing body of evidence suggests that they represent central tendencies (averages) of real-time state expressions (Ching et al., 2014; Church et al., 2013; Fleeson, 2001, 2007; Judge et al., 2014). Situation characteristics, on the other hand, predict deviations from such central tendencies. Ultimately, both personality traits and experienced situation characteristics appear to independently predict behavior.

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Table 1

Predicted relationships between personality, situation characteristics, and trait expressions

<u>Trait Expression</u>	<u>Personality Trait</u>	<u>Situation Characteristic</u>
Honesty/Humility	Honesty/Humility	Deception (-)
Emotionality	Emotionality	Adversity Negativity
Extraversion	eXtraversion	Sociality
Agreeableness	Agreeableness	Sociality Positivity Deception (-) Mating (Females)
Conscientiousness	Conscientiousness	Duty
Openness	Openness	Intellect
Dominance	eXtraversion	Adversity Mating (Males)
Happiness	Subjective Happiness	Positivity
Self-Esteem	Subjective Happiness	Positivity

Note. (-) indicates that a negative relationship was predicted.

Table 2
Descriptive Statistics and Correlations for Between-Person Variables

<i>Trait Variables</i>	<i>M</i>	<i>SD</i>	<i>Correlations</i>															
			<i>H</i>	<i>E</i>	<i>X</i>	<i>A</i>	<i>C</i>	<i>O</i>	<i>Happy</i>	<i>Dut</i>	<i>Int</i>	<i>Adv</i>	<i>Mat</i>	<i>pOs</i>	<i>Neg</i>	<i>Dec</i>	<i>Soc</i>	
Honesty/Humility	3.33	0.55	.62															
Emotionality	3.27	0.67	.05	.76														
eXtraversion	3.57	0.62	-.01	-.13	.79													
Agreeableness	3.31	0.63	.27	.01	.15	.75												
Conscientiousness	3.59	0.57	.27	-.04	.24	.07	.75											
Openness	3.20	0.66	.15	-.07	.09	.14	.22	.74										
Happiness	5.30	1.20	.13	-.05	.60	.34	.15	.00	.82									
<i>Mean Situation Variables</i>																		
Duty	4.18	1.16	-.01	.23	-.02	.05	.17	.01	-.04	---								
Intellect	3.34	1.08	-.02	.03	-.02	.01	.10	.10	-.01	.70	---							
Adversity	1.71	0.87	-.25	-.06	-.12	-.25	-.20	-.02	-.11	.06	.35	---						
Mating	2.55	1.20	-.11	-.08	.09	.03	-.01	-.04	.13	.13	.29	.35	---					
pOsitivity	4.47	1.01	.17	-.08	.12	.29	.02	.11	.21	.14	.08	-.27	.21	---				
Negativity	2.47	1.01	-.10	.17	-.25	-.16	-.20	.00	-.28	.37	.46	.69	.32	-.25	---			
Deception	1.67	0.82	-.30	-.09	-.14	-.22	-.21	.01	-.17	.08	.35	.93	.34	-.20	.65	---		
Sociality	4.08	0.99	-.09	.16	.05	.09	.01	.04	.11	.41	.29	.07	.37	.45	.22	.08	---	

Note. *Ns* are 209 for all trait variables and range from 179 to 195 for all mean situation variables. Alphas for trait variables are on the diagonal. Trait variables were measured on a 1 to 5 scale, except for Happiness which was measured a 1 to 7 scale. Situation variables were measured on a 1 to 7 scale.

Table 3

Variance components, ICCs, and Intercepts for Trait Expressions and Situation Characteristics

Scales	τ_{00}	σ	ICC	Intercept	<i>n</i>
<i>Trait Expression</i>					
Honesty/Humility	1.08	1.27	.46	5.67	8295
Emotionality	1.27	2.64	.32	3.51	8264
Sociability	1.14	2.76	.29	4.71	8284
Agreeableness	1.01	1.69	.37	5.39	8281
Conscientiousness	1.02	2.35	.30	4.86	8296
Openness	1.00	1.63	.38	5.13	8286
Dominance	1.12	1.80	.38	4.44	8289
Happiness	1.10	1.97	.36	5.35	8286
Self-esteem	1.30	1.78	.42	5.40	8296
<i>Situation Characteristic</i>					
Duty	1.23	4.12	.23	4.19	8290
Intellect	1.02	3.79	.21	3.34	8286
Adversity	0.68	1.18	.36	1.69	8284
Mating	1.29	3.19	.29	2.51	8302
Positivity	0.92	3.30	.22	4.43	8285
Negativity	0.96	2.46	.28	2.45	8298
Deception	0.63	1.09	.36	1.68	8295
Sociality	0.90	4.43	.17	4.03	8397

Note. $N = 210$. τ_{00} = Variance between intercepts (between-person variance), σ = Variance around intercepts (within-person variance), ICC = proportion of variance between persons divided by total variance. Intercept = fixed effects intercept from unconditional cell means model (approximately the average rating on the construct).

Table 4

Model Parameters for Predicting Situation Experiences from Personality Traits

Situation Characteristic	<i>b</i>	LL	UL	<i>t</i>	<i>R_m</i>	<i>R_c</i>
<u>Deception</u>	1.68	1.58	1.78		.16	.60
Trait Honesty/Humility	-.39	-.50	-.19	-3.94		
SD in Intercepts	.77	.69	.84			
SD in Residuals	1.05	1.03	1.06			
<u>Negativity</u>	2.45	2.30	2.59		.08	.53
Trait Emotionality	.21	.00	.40	2.00		
SD in Intercepts	.97	.88	1.06			
SD in Residuals	1.57	1.55	1.60			
<u>Sociality</u>	4.03	3.90	4.17		.05	.41
Trait eXtraversion	.19	-.03	.40	1.67		
SD in Intercepts	.94	.84	1.04			
SD in Residuals	2.11	3.90	4.16			
<u>pOsitivity</u>	4.43	4.30	4.56		.14	.47
Trait Agreeableness	.47	.26	.67	4.45		
SD in Intercepts	.92	.82	1.01			
SD in Residuals	1.82	1.79	1.85			
<u>Deception</u>	1.68	1.55	1.80		.10	.60
Trait Agreeableness	-.21	-.38	-.02	-2.42		
SD in Intercepts	.78	.70	.86			
SD in Residuals	1.05	1.03	1.06			
<u>Duty</u>	4.19	4.02	4.34		.06	.48
Trait Conscientiousness	.24	-.03	.53	1.69		
SD in Intercepts	1.10	.98	1.21			
SD in Residuals	2.03	2.00	2.07			
<u>Intellect</u>	3.34	3.20	3.49		.03	.46
Trait Openness	.10	-.13	.33	0.88		
SD in Intercepts	1.02	.91	1.12			
SD in Residuals	1.95	1.92	1.98			
<u>pOsitivity</u>	4.43	4.29	4.57		.13	.47
Trait Happiness	.22	.11	.34	3.90		
SD in Intercepts	.93	.83	1.01			
SD in Residuals	1.82	1.79	1.85			

Note. *N* = 209. *bs* are unstandardized multilevel regression coefficients. Traits were mean-centered and measured on a 1 to 5 scale. Situation characteristics were measured on a 1 to 7 scale. LL and UL represent lower and upper limits for 95% confidence intervals, respectively,

based on $K = 500$ bootstrap resamples. R_m and R_c = Marginal and Conditional Multiple Rs (Nakagawa & Schielzeth, 2013).

Table 5
Fixed Effects of Multilevel Models of Interest

Personality Expression	<i>b</i>	LL	UL	<i>t</i>	<i>R_m</i>	<i>R_c</i>
<u>Honest/Humble Behavior</u>	5.66	5.53	5.80		.37	.71
Trait Honesty/Humility	.29	.06	.55	2.30		
Mean Situation Deception	-.60	-.77	-.44	-7.10		
Situation Deception	-.18	-.23	-.13	-7.24		
Interaction	-.12	-.22	-.04	-2.71		
<u>Emotionality Behavior</u>	3.50	3.34	3.66		.26	.63
Trait Emotionality	.26	.02	.51	2.16		
Mean Situation Adversity	.02	-.26	.30	0.13		
Mean Situation Negativity	.30	.06	.53	2.59		
Situation Adversity	.05	.00	.10	2.18		
Situation Negativity	.21	.16	.26	8.55		
<u>Sociability Behavior</u>	4.71	4.56	4.86		.37	.65
Trait eXtraversion	.64	.40	.87	5.28		
Mean Situation Sociality	.31	.16	.46	4.10		
Situation Sociality	.25	.22	.28	14.44		
Interaction	-.07	-.13	-.02	-2.69		
<u>Agreeableness Behavior</u>	5.45	5.32	5.38		.44	.72
Trait Agreeableness	.18	-.03	.40	1.65		
Mean Situation Sociality	.03	-.12	.19	0.40		
Mean Situation pOsitivity	.25	.09	.41	3.02		
Mean Situation Deception	-.60	-.78	-.42	-6.74		
Situation Sociality	.02	.00	.04	2.11		
Situation pOsitivity	.18	.15	.22	10.36		
Situation Deception	-.17	-.22	-.11	-6.29		
<u>Conscientiousness Behavior</u>	4.89	4.75	5.04		.25	.62
Trait Conscientiousness	.63	.39	.88	5.12		
Mean Situation Duty	-.02	-.14	.11	-0.28		
Situation Duty	.14	.11	.17	8.56		
<u>Openness Behavior</u>	5.13	4.98	5.27		.16	.65
Trait Openness	.37	.15	.59	3.29		
Mean Situation Intellect	-.07	-.21	.06	-1.08		
Situation Intellect	.04	.01	.06	2.90		
<u>Dominance Behavior</u>	4.43	4.27	4.59		.18	.65
Trait Extraversion	.39	.15	.63	3.22		
Mean Situation Adversity	-.20	-.38	-.03	-2.32		
Situation Adversity	.05	-.01	.10	1.73		

<u>Happiness Feelings</u>	5.40	5.27	5.53		.44	.70
Trait Happiness	.26	.14	.37	4.43		
Mean Situation pOsitivity	.42	.29	.56	6.37		
Situation pOsitivity	.28	.25	.32	15.23		
<u>Self-Esteem</u>	5.46	5.31	5.60		.40	.72
Trait Happiness	.28	.16	.41	4.44		
Mean Situation pOsitivity	.41	.26	.55	5.53		
Situation pOsitivity	.22	.18	.25	13.11		

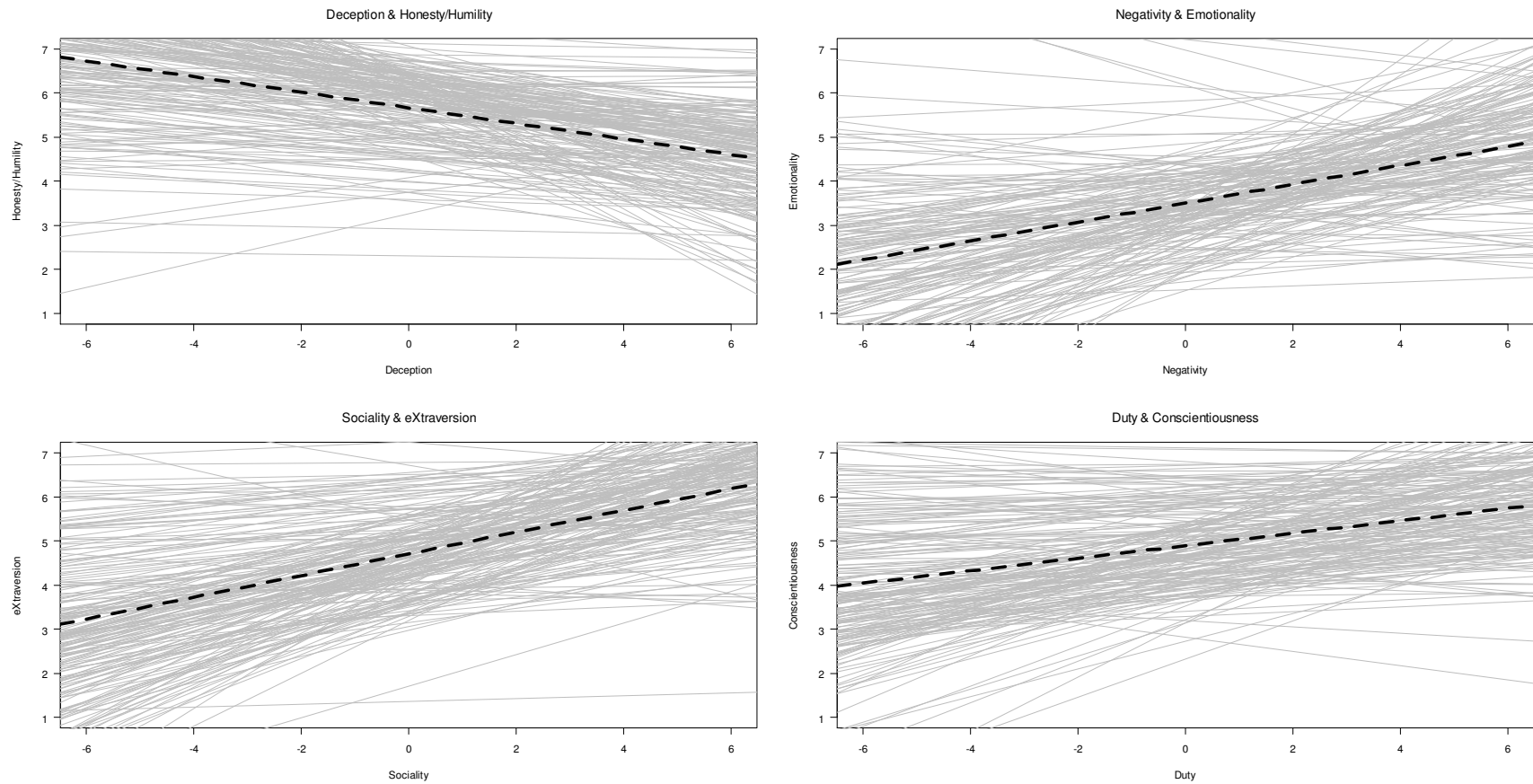
Note. *bs* are unstandardized multilevel regression coefficients. LL and UL represent lower and upper limits for 95% confidence intervals respectively based on $K = 500$ bootstrap resamples. R_m and R_c = Marginal and Conditional Multiple Rs (Nakagawa & Schielzeth, 2013). Trait-level variables were measured from 1 to 5, while state-level variables were measured from 1 to 7. All predictors were entered simultaneously.

Table 6
Random Effects (SDs) for Multilevel Models of Interest

Personality Expression	SD	LL	UL	<i>r</i>			Rel
<u>Honest/Humble Behavior</u>	.90	.80	1.00				
Situation Deception	.22	.18	.27	-.23			.15
Residual	1.08	1.06	1.10				
<u>Emotionality Behavior</u>	1.06	.94	1.18				
Situation Adversity	.14	.08	.20	-.39			.13
Situation Negativity	.26	.22	.30	-.38	.05		.52
Residual	1.54	1.51	1.56				
<u>Sociability Behavior</u>	1.00	.88	1.10				
Situation Sociality	.20	.17	.23	-.32			.56
Residual	1.51	1.48	1.53				
<u>Agreeableness Behavior</u>	.83	.73	.93				
Situation Sociality	.08	.06	.10	-.29			.02
Situation pOsitivity	.18	.15	.21	-.23	-.01		.09
Situation Deception	.21	.16	.26	.13	.42	.14	.13
Residual	1.14	1.12	1.17				
<u>Conscientiousness Behavior</u>	.97	.86	1.07				
Situation Duty	.18	.16	.21	-.30			.62
Residual	1.45	1.43	1.48				
<u>Openness Behavior</u>	.99	.88	1.09				
Situation Intellect	.14	.11	.16	-.18			.45
Residual	1.25	1.22	1.27				
<u>Dominance Behavior</u>	1.04	.93	1.16				
Situation Adversity	.26	.21	.31	-.49			.17
Residual	1.32	1.30	1.34				
<u>Happy Feelings</u>	.88	.78	.98				
Situation pOsitivity	.22	.19	.25	-.23			.55
Residual	1.25	1.23	1.27				
<u>Self-Esteem</u>	.98	.88	1.09				
Situation pOsitivity	.18	.16	.21	-.26			.35
Residual	1.22	.120	1.24				

Note. SD = Standard deviation of random effect scores. LL and UL represent lower and upper limits for 95% confidence intervals, respectively, based on K=500 bootstrap resamples. *r* = correlations among random effects (i.e., correlations between intercepts and slopes, and slopes with other slopes). All predictors were entered simultaneously. Rel = reliability of individual differences in slopes for models containing only the within-person centered situation predictor.

Figure 1
Spaghetti Plots of Situation-Based Behavioral Contingencies



Note. Solid gray lines represent estimated regression lines for each participant. Dashed black lines represent the average regression lines. Situation characteristics (x -axes) are within-person centered.

Online Supplemental Materials

Interval	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	9:01 AM	9:03 AM	10:38 AM	9:06 AM	9:13 AM	9:26 AM	10:08 AM
2	10:53 AM	10:24 AM	12:18 PM	10:52 AM	10:21 AM	11:43 AM	11:38 AM
3	12:00 PM	3:07 PM	2:00 PM	1:04 PM	11:47 AM	12:42 PM	3:34 PM
4	2:03 PM	4:05 PM	3:08 PM	2:27 PM	1:35 PM	1:43 PM	5:03 PM
5	4:42 PM	5:57 PM	4:30 PM	5:05 PM	3:24 PM	3:25 PM	6:10 PM
6	6:54 PM	7:06 PM	5:28 PM	6:38 PM	4:17 PM	5:59 PM	7:08 PM
7	7:40 PM	9:21 PM	6:29 PM	7:57 PM	6:06 PM	7:43 PM	8:30 PM
8	9:54 PM	10:58 PM	7:59 PM	8:57 PM	7:28 PM	10:05 PM	10:25 PM

Footnotes

¹ The term “re-recognitions” is used here because foundational texts in personality psychology made both of these points at the outset (Allport, 1937; Murray, 1938).

² Alternatively, TAT could also posit that personality traits serve as moderators to the relationship between situation characteristics and behavior as, mathematically, they are identical (i.e., traits and situations interact). It is also worth noting that Tett and Gutterman (2000) use the phrase “situation cues” where we would use the phrase situation characteristics (see Rauthmann et al., 2014).

³ This is not to imply that there are only few studies examining the effects of persons and situations simultaneously. Many social psychology experiments manipulate some situational variable and measure person-level variables as possible moderators. However, *measuring* situation variables as they are experienced in real-life is different from manipulating them in the laboratory.

⁴ The number of participants was determined *a priori* to be approximately 200 because this yields 95% confidence intervals on the scale of Z_r that are less than +/- .15. In practice, we attempted to gather data from 220 participants to accommodate for attrition and other sources of data loss. We stopped at 218 because it marked the end of the subject pool period.

⁵ No participants refused to be video recorded, although one video was accidentally deleted by a research assistant. Data (e.g., behavior, word use) from these videos were not analyzed as part of this article, but have been published elsewhere (Brown & Sherman, 2014).

⁶ Occasionally, some participants completed the survey even when they were not sent texts, explaining the fact that the maximum number of reports (65) was greater than the number of text messages sent (56). This issue was handled by preprocessing.

⁷ As with all data reported from our laboratory, the raw data used in this study and R scripts used for analyses reported here are available as supplemental materials.

⁸ For this analysis, only a single within-person centered situation variable was entered into the multilevel and OLS models. Thus, these estimates represent the best possible reliabilities in situation-based contingencies.

⁹ Note that this conclusion assumes the DIAMONDS characteristics are as representative of situations as the HEXACO traits are of behaviors.