The Stability of Daily Situation Experiences

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Abstract

How stable are people's day-to-day lives? It is now well-established that personality traits and behavior are quite stable over time (Roberts & DelVecchio, 2000). Several theories of personality suggest that the stability of one's environment contributes to the stability of personality. However, little is known about the extent to which features of people's daily environments are stable. In this secondary analysis, I examined the rank-order stability of individual differences in features of daily situations in a 2-year longitudinal study of daily life ($N = 387$). I analyzed three waves of two-week Experience Sampling Method (ESM) assessments of daily situation experiences, personality states, and behavior. ESM open responses were also coded for the DIAMONDS characteristics in the first two waves of ESM assessment. Personality states were found to be stable from year-to-year (M Stability = .63). Situated experiences (e.g., familiarity) were found to be about as stable as personality states. Activities (e.g., at home) and the eight DIAMONDS characteristics were found to be less stable than personality and situated experiences, but still showed moderate stability. These findings suggest that situation experience may be a viable individual difference and that the stability of environments may contribute to the stability of behavior, and vice versa.

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The Stability of Daily Situation Experiences

Introduction

How much do people change from one year to the next? After decades of studying personality over the lifespan, a large body of evidence suggests that people's personality is quite stable over time. People who are more talkative than their peers at one point in time are likely to still be near the top of the distribution in talkativeness years later (Roberts & Mroczek, 2008). Conversely, we know relatively little about how much people's daily experiences — the activities they do and the situations they find themselves in — change from year to year. Given that personality encapsulates patterns in behavior, it is likely that daily situation experiences are relatively stable. However, there is little direct empirical evidence of stability in situation experiences. In the first test of this question, I analyzed an existing dataset that includes three waves of intensive, naturalistic assessments of situation experiences in college students over two years.

Understanding the stability (or lack thereof) of people's situation experiences is fundamental to understanding human behavior, especially social behavior. Stable situations could potentially be a source of stability in personality and behavior, and indeed in life. For example, if some people consistently find themselves interacting with people they know very well, this could contribute to the stability of their levels of extraversion. It could also reflect the influence of their extraversion on their tendency to select into particular social environments, as person-situation transactions are likely bidirectional (Buss, 1987). Conversely, if individual differences in situation experiences are not stable (i.e., if people find themselves in vastly different social situations and do different social activities from one year to the next), this would suggest that situation experiences reflect temporary circumstances rather than a core aspect of a

person's character. Thus, whether situation experiences are stable or not has implications for how psychologists should approach behavior change. If situation experiences are generally stable, interventions aimed at changing behavior should also consider changing the characteristics of people's everyday situation experiences.

This study utilizes data collected using the Experience Sampling Methodology (ESM), a common type of intensive measurement. These data come from a 2-year measurement-burst study of college students at a large private university in the Midwest region of the United States. The study was designed to examine the relationship between personality, self-knowledge, and behavior. Therefore, I am conducting a secondary data analysis to answer the questions I outlined above; the extent to which this is a limitation of this study will be outlined below.

The process of selecting the term that most accurately describes the variables under investigation was a difficult one. Some of the variables examined here are subjective, others are behavioral in nature, others encapsulate more objective environmental characteristics. The literature on situations is lexically slippery (Rauthmann, Sherman, & Funder, 2015), and the broader literature on environments, situations, and experiences even more so. Below I review how psychologists have conceptualized and categorized external, psychologically relevant characteristics. I will investigate three constructs, note the overlap and differentiation between them, and link the existing literature to the current study.

Environments

Despite the prolonged debate about the power of the person versus the environment, psychologists have long understood that both constructs are important for producing behavior (Lewin, 1936). In the last five decades, personality psychologists have argued that personality traits are a stable individual difference that can be used to predict life outcomes (Roberts &

Mroczek, 2008) and have developed robust, widely used taxonomies of personality traits (e.g., John & Srivastava, 1999; Lee & Ashton, 2010). However, the development of a taxonomy to encapsulate a person's environment — the other half of Lewin's equation ($Behavior \sim f(Person, Environment)$) — had, until recently, received little empirical attention in personality psychology (Baumeister et al., 2007; Reis, 2008). Though social and personality psychology has long theorized about the contribution of the environment to the stability of behavior (Ross & Nisbett, 2011), the discipline lacks a framework to comprehensively study situations. As a result of this knowledge gap, it is unclear whether environments, particularly social environments, are a stable part of an individual's experience that helps define who they are.

But what *is* the social environment? The term “social environment” is frequently used outside of psychology — particularly in public health and sociology — often referring to the broad characteristics of one's social life, including: social relationships, living conditions, neighborhoods, communities, institutions, and broader social and economic policy (Chen & Schreier, 2008; Kaplan, 1999; Van Wormer & Besthorn, 2017). Within social and personality psychology, the environment has been defined as “the aggregate of larger physical and psychological conditions that influence human behaviors” (Yang, Read, & Miller, 2009, p. 1019). Environments are the most general level of *external* influences on behavior, and the social environment is often the focus of research in psychology. Due to the breadth of the concept of a social environment, research on the effects of social environments on behavior is generally piecemeal, focusing on certain aspects of social relationships or social settings rather than a holistic approach (Barker, 1965; Yang et al., 2009). However, a consideration of a broader social environment is critical to understanding how the individual interacts with these external forces.

Despite a general lack of understanding of what the social environment is, social and personality psychologists mostly use the term casually in literature reviews to refer to the broadest conceptualization of a topic or research area. In the current literature, social and personality psychologists have turned to situations as their chief conceptualization of external factors that influence personality and behavior. In line with recent work in this area, I measured situations using a bottom-up approach tailored for the current study.

Situations

The process of defining situations has been an arduous one for many social scientific disciplines, and social and personality psychology are no different in this struggle (Baumeister et al., 2007; Lucas & Donnellan, 2009; Milgram & Gudehus, 1974). The task of creating a satisfying taxonomy of situations has haunted the discipline, practically since birth (Hogan, 2009; Swann & Seyle, 2005; Yang et al., 2009). At a broad level, psychologists have defined the situation as an intermediary between stimuli — “a specific object that gives rise to the organism’s response” (Yang et al., 2009, p. 1019) — and the environment. Situations therefore occur within a broader environment. Although situations are theoretically more constrained than environments, universal consensus has yet to be reached regarding the categorization and conceptualization of situations (Rauthmann, Sherman, & Funder, 2015). Below, I outline several relevant frameworks for conceptualizing and categorizing situations, and then discuss how these frameworks inform the current study.

Conceptualizing situations. Social and personality psychologists have understood the importance of the situation, but have long debated the extent to which situations are objective or subjective (Rauthmann, Sherman, & Funder, 2015). Are situations solely outside the perceiver, or are they psychologically relevant only if they exist in the eye of the beholder? Perspectives

that emphasize the power of the environment or the situation (e.g., ecological psychology, social-cognitive psychology) have emphasized an objective approach, whereas perspectives that focus on the person (e.g., personality psychology) have emphasized a subjective approach. However, as is often the case, it is increasingly evident that both aspects of situations are psychologically meaningful, in distinct ways. More recent, influential frameworks have acknowledged the importance of both objective and subjective elements of situations; these frameworks integrate these sources of information into a single structure, enabling a more comprehensive study of situations.

Block and Block (1981) proposed one of the earliest comprehensive frameworks for conceptualizing situations. Block and Block proposed that there are three levels at which we can analyze situations, which were later renamed by Saucier, Bel-Bahar, and Fernandez (2007): (1) the environmental level, which refers to the most objective features of the situation (e.g., location, time of day); (2) the consensual level, which refers to features of the situation that can be perceived by all participants in a situation (e.g., that a gathering of people celebrating a marriage is a wedding, that students sitting in a classroom with a lecturer are in class); and (3) the functional level, which refers to the most subjective features of the situation that are person-specific, and are not directly perceived by other people (e.g., “I was stressed around my parents”, “I felt worried for my friend who went skydiving”). This framework incorporates a range of both objective and subjective information and provides a basis for future theoretical advancements.

Rauthmann and colleagues (2015) reviewed the literature on situations and proposed their own answer to the objective-subjective situation debate. In Rauthmann and colleagues’ framework, situational information is organized into three categories: (1) cues, which refer to directly observable features of situations (e.g., temperature, time of day); (2) characteristics,

which refer to the psychological features of situations (e.g., embarrassment), and (3) classes, which refer to categories of situations (e.g., a funeral). There are noted similarities between the framework proposed by Block and Block (1981) and Rauthmann and colleagues' framework: Block and Block's environmental level corresponds to Rauthmann and colleagues' cues and Block and Block's consensual level corresponds to Rauthmann and colleagues' characteristics. The functional level of Block and Block's framework shares some overlap with characteristics in Rauthmann and colleagues' framework, but also overlaps with the classes distinction, in that many contemporary situation taxonomies use more subjective aspects of situations in their classification of situations (Parrigon et al., 2017; Rauthmann et al., 2014).

Categorizing situations. Despite an understanding that situations are multifaceted and contain multiple sources of information, psychologists have lamented the lack of an established taxonomy of situations (Swann & Seyle, 2005). A taxonomy of situations would play a critical role in unifying the research on situations and providing a clear framework for research that involves the study of situations, both within and outside psychology.

Two recent taxonomies have stimulated a growth in systematic research on situations. First, Rauthmann and colleagues (2015) proposed the DIAMONDS taxonomy, developed by factor analyzing the 80-item Riverside Situational Q-Sort (Sherman et al., 2010; Wagerman & Funder, 2009), an ipsative measure of the psychological properties of situations. The DIAMONDS consists of eight classes of situation characteristics: Duty, Intellect, Adversity, Mating, pOsitivity, Negativity, Deception, and Sociality (Rauthmann et al., 2014; Rauthmann & Sherman, 2017). Second, the CAPTION taxonomy — proposed by Parrigon and colleagues (2017) — is the most comprehensive attempt to derive a taxonomy of situations using an English adjectives lexical approach, similar to the approach used to develop the Big Five personality

traits (John, 1990). The CAPTION taxonomy has seven factors: Complexity, Adversity, Positive valence, Typicality, Importance, humor, and Negative valence. In comparing these two taxonomies Rauthmann and Sherman (2017) found five replicable factors across the two approaches: external threats or obstacles (Adversity, Negative valence); negative, distressing events (Negativity, Adversity); important or urgent tasks are involved (Duty, Importance); deeper and effortful cognitive information processing (Intellect, Complexity); pleasant, fun events (Positivity, Positive valence). Although both taxonomies have been deployed primarily using self-report methods, both models have been tested using basic validation techniques, including inter-rater reliability, observer-ratings, and the prediction of behavior and personality.

The development and proliferation of these taxonomies suggests an interesting future for situation research. Although these situation taxonomies contain important information about external environments (e.g., cues), they are primarily concerned with situation *characteristics*, or the functional level in Block and Block's (1981) framework. In both the CAPTION and the DIAMONDS taxonomies, subjective characteristics are deemed to be most important in the measurement of situations. Indeed, Positivity/Positive valence and Negativity/Negative valence seem to be primarily affective states, given that external environments do not inherently contain positive or negative valuations.

In line with this focus on the subjective elements of situations, another taxonomy has emerged to assess situation *perception*. Ziegler and colleagues (2019) introduced the Situation Five: Outcome-Expectancy (e.g., "confident"), Briskness (e.g., "lively"), Cognitive Load (e.g., "mind-wracking"), Psychological and Physical Load (e.g., "tense"), and Lack of Stimuli (e.g., "boring"). These lexically-derived characteristics explain individual differences in how different people perceive the same external situations. Although this framework has only been applied to

the study of work situations (Ziegler et al., 2019), its emergence is further evidence of the primacy of subjective elements of situations in social and personality psychology.

Does the reliance on subjectivity limit the scope of situation research? In a commentary on the CAPTIONS taxonomy, Reis (2018) suggested that bottom-up approaches to situation categorization are inherently flawed, due to the imperceptibility of the wide range of situation characteristics by humans. Reis suggests that while the CAPTION taxonomy captures “common everyday situations” (p. 490) as described by the self, it is less relevant for the study of situations in psychology, as psychologists are concerned with the unique characteristics of certain (not necessarily common) situations and how individuals differ in their response to them. In response to these comments, Parrigon and colleagues (2018) asserted the critical need for a generalizable taxonomy of situations in psychology, in order to maximize the explanatory power of situations and more comprehensively represent the range of situations people experience. Though Reis’ assertion that top-down, theory-driven situation taxonomies are superior for the study of psychology is compelling, the history of situation research tells us that this approach leads to a fragmented study of situations, with no unifying taxonomy of situation characteristics.

I conducted a bottom-up approach to the study of experienced environments and situations, using measures that focus on the everyday situation experiences of individuals and examining their stability. I used a range of variables that encapsulate more subjective experiences of situations (e.g., how stressful the situation was to the participant) and more objective characteristics of situation experiences (e.g., was the participant alone or with other people). I also incorporated the DIAMONDS framework by coding hourly diary entries for the eight characteristics (e.g., this situation contains communication, interaction, social relationships [Sociality]). These measures capture both dimensional characteristics of situations and concrete

features of situations, which will illuminate the descriptive differences and differences in stability between the two approaches. Each measure focuses on the individual's *experience* of situations; in the next section, I review the psychology literature on experience and how it differs from the study of pure situations or environments.

Experiences

In the objective-subjective situation debate, psychologists tend to come out on the side of the subjective: the most important characteristics of situations are the ones that are most clearly perceived and experienced by the individual. What do psychologists mean when they talk about the experience of situations or environments? The Oxford English Dictionary defines the noun “experience” in several ways, including “the actual observation of facts or events, considered as a source of knowledge” and “the fact of being consciously the subject of a state or condition, or of being consciously affected by an event [...]”; a state or condition viewed subjectively; an event by which one is affected” (“Experience,” 2019). These definitions emphasize the relationship of an event or concrete fact with the perception, memory, and knowledge gained from said event or fact. These definitions can provide some framing for how psychologists typically deploy the word in the research literature. Though the word is commonly used in the social and personality psychology literatures, there is little explicit defining of what the word means in the psychological realm. In their paper on the validity of the *Experience Sampling Methodology* (ESM), Csikszentmihalyi and Larson (1987) outline the phenomena that ESM can measure: “activities, feelings, thoughts, motivations, and medical symptoms”, in addition to “the common experience of situations” and “the dynamics of emotions and other subjective states” (p. 533). Most psychologists would likely agree that experiences are remembered perceptions of one's environment and their own physical, affective, and behavioral state (Middleton & Brown, 2005).

Use of ESM has proliferated in social and personality psychology following the advent and popularization of mobile phones (Harari, Müller, et al., 2017). But when we measure “experiences,” what exactly are we measuring? Given the wide ranging definition set by Csikszentmihalyi and Larson (1987), psychologists use ESM as a means to examine daily experiences of personality states (Fleeson, 2001), affective states (Kahneman et al., 2004), situation experiences (Rauthmann et al., 2016), relationship satisfaction (Oishi & Sullivan, 2006), symptoms of psychopathology (Trull & Ebner-Priemer, 2009) and organizational behavior (Beal, 2015). In sum, the limits to what ESM can study have largely been set by researchers, with little empirical investigation into what variables ESM is best suited to measure.

Some recent research has investigated the parameters of what ESM can do. Earlier research suggested that the maximum and minimum values of affect (Fredrickson, 2000; Parkinson et al., 1995) and the maximum values of personality states (Fleeson & Gallagher, 2009) were more closely related to global retrospective reports, but more recent, rigorous research suggests that the average of momentary reports is the most valid measure of daily experiences of personality, affect, and relationship satisfaction; though minimum values provide some incremental validity, this pattern is less robust (Miron-Shatz, 2009; Zygars-Hoffmann & Schönbrodt, 2020). Further, previous research has demonstrated that ESM assessment periods of at least two weeks are necessary to obtain enough reports for valid aggregated states (Epstein, 1979; Zygars-Hoffmann & Schönbrodt, 2020). Indeed, Fleeson and Gallagher (2009) found that the relationship between the average personality states and global traits weakened in strength with ESM assessment periods longer than two weeks. This study utilizes a two-week long ESM study and will use the aggregate of situation experiences to examine the stability of these daily experiences.

Is the study of daily experiences important in and of itself? There seems to be little debate about the utility of ESM for measuring psychological, affective, and behavioral states — though some question the predictive validity of daily experiences when aggregated into individual difference variables (Finnigan & Vazire, 2017). We can, however, look to the debate over the categorization and conceptualization of situations for clues as to how psychologists consider this question. As referenced above, Reis (2018) downplayed the importance of a taxonomy representing common, everyday situations and advocated for the study of exceptional, psychologically-relevant situations. Parrigon and colleagues (2018) asserted the importance of a taxonomy of everyday situations for studying the broadest range of situations that are experienced in daily life. This debate can be simplified this way: should psychologists study what people can do, or what they usually do?

Though I cannot resolve this debate here, I do assert that (1) psychologists still know relatively little about people's everyday psychological and situational experiences and (2) that understanding the dynamics of daily life is an important bedrock for the study of personality and social psychology. Though there is some important cross-sectional work in psychology that describes daily life (Barker & Wright, 1951; Csikszentmihalyi et al., 1977; Kahneman et al., 2004; Mehl et al., 2006, 2007; Mehl & Pennebaker, 2003), the discipline quickly jumped from the “what” of behavior and situations to the “how” and the “why” (Baumeister et al., 2007). Descriptive studies examining the “what” of behavior tend to examine the common-sense questions that are highly relevant and interesting to laypeople. For example, findings that women and men talk the same amount on average (Mehl et al., 2007) or that greater income is associated with less daily sadness (Hudson et al., 2016; Kushlev et al., 2015) may seem simple, but these are influential, important findings that were informed by studies of daily experiences. The

relative lack of descriptive information about people's real lives and experiences is a significant gap in the literature that I attempt to address in this study. I focused on one critical element of people's daily lives: their situation experiences, and the extent to which these experiences are stable. I will next review the existing literature on the frequency and the stability of situation experiences and some possible results of this study.

Frequency

Understanding the frequency of situation experiences, especially those related to specific behavior, has been a key question in social and personality psychology from the birth of the discipline. In order to understand social processes, we must also understand how often and under what conditions they occur. Methodologies for studying the frequency of situation experiences include written daily diaries, direct observation, and retrospective reports (e.g., Barker & Wright, 1951; Gosling et al., 1998; Kahneman et al., 2004). Earlier work on this topic yielded important insight into the dynamics of personality states, affective states, and elements of situation experiences in daily life. Csikszentmihalyi and colleagues (1977) used ESM to observe adolescents for a one week period and found that adolescents spent the most time talking with peers (14.7%), watching TV (10.6%), and studying (8.8%); the researchers also observed affective patterns and found that adolescents experienced more negative affect during situations that they felt obligated to participate in. In an ESM study examining flow in daily life across different classes of workers, Csikszentmihalyi and LeFevre (1989) found that managers and blue-collar workers spend about 30 hours a week at work, whereas clerical workers reported spending 23 hours a week at work; all groups reported similar levels of time spent eating (4-5 hours a week), self-care (3 hours/week), activity (2 hours/week), and daydreaming (1-2 hours/week). Despite the significance of this earlier work, many of these studies had very small

sample sizes and low power to detect any mean-level differences in situation experience between groups.

Research utilizing newer technologies has enabled the study of the daily behaviors and situation experiences of a wider range and volume of individuals. Harari and colleagues (2017) used smartphone sensing data to track the movements of college students across a semester, finding that participants spent an average of 5 hours a week socializing with others, and an average of one hour a week doing physical activity. In another set of smartphone sensing studies, Harari and colleagues (2019) found that on average, young adults spend 5 minutes or less on the phone and spend 20 minutes on messaging and social media mobile applications. In conjunction with ESM methodologies, smartphone sensing data can provide unique and important insights into daily situation experience in the digital age.

Beyond the scope social and personality psychology, time use research has provided significant insight into the frequency of more external elements of situation experience (Harvey & Pentland, 2002; Rohrer & Lucas, 2018). In 2018, individuals from a representative sample of American households spent $M = 5.27$ hours per day doing sports and leisure activities, $M = 8.82$ hours/day asleep, and $M = 3.57$ hours/day doing work or work-related activities, according to the U.S. Bureau of Labor Statistics (2019). Tracking situation frequency has important social, economic, and political implications, and time use studies have illuminated how cultural trends impact how people spend their time.

Beyond the descriptive purposes that time use data serves, understanding the base rates of situation experiences is critical to the study of social dynamics and perception. Previous research suggests that more commonly experienced situations are perceived similarly by the self and observers (Gosling et al., 1998). A common approach in social psychology is placing participants

in controlled situations and manipulating features of the situations to examine social dynamics; a rigorous understanding of how novel a situation is to a certain population is needed to correctly interpret the results of the study. For example, if a study of stereotype threat uses a math test as its stimulus, understanding the frequency of how often the population of interest experiences a classroom situation would have impact on the results (e.g., college students are likely familiar with classrooms, older adults farther removed from school may be less familiar). In short, a robust understanding of the normativity and novelty of different situation experiences is critical to the study of both people and environments. Though there is a substantial literature of time use and daily situational experiences, this research must be more thoroughly integrated into social and personality psychology.

Variability in frequency. Research on the frequency of situation experience supplies us with the Environment element of Lewin's (1936) equation ($Behavior \sim f(Person, Environment)$). However, as discussed above, the interaction between the Person and the Environment is fundamental to social and personality psychology. Indeed, variability in the frequency of situation experiences is driven by individual differences (e.g., personality traits, race, gender, class) at both the between-person and within-person levels. In this section, I will discuss past research and theories regarding both levels of variability.

Large scale time use research has illuminated between-person variability in situation experience associated with demographic characteristics (e.g., Gennetian & Rodrigues, 2020; Zannella & De Rose, 2019). The American Time Use Survey in 2018 demonstrated that full-time employed men worked slightly more ($M = 8.2$ hours/day) than full-time employed women ($M = 7.9$ hours/day) on average, and employed women do more domestic work ($M = 2.02$ hours/day) and childcare ($M = 1.32$ hours/day) than men (domestic work: $M = 1.20$ hours/day; childcare: M

= 0.71 hours/day; Bureau of Labor Statistics, 2019). Research in psychology has also shown that situation experience frequency differs by age group; older adults are more likely to spend time alone than younger adults (Larson, 1990; Wrzus et al., 2016). Developmental changes in situation experience will be described further in the Stability section below.

In line with theories of person-environment fit (Roberts & Robins, 2004) and situation selection (Buss, 1987), global personality traits are also associated with patterns of situation experience, often in line with folk theories of personality (Mehl et al., 2006). A substantial body of research has demonstrated that extraversion is linked to increased experience of social situations and conscientiousness is linked to increased experience of work-related situations (Emmons & Diener, 1986; Rohrer & Lucas, 2018; Wrzus et al., 2016). Neuroticism is linked to more time spent alone (Mehl et al., 2006; Wrzus et al., 2016). Agreeableness is less robustly related to specific activities, but previous research suggests that agreeableness has strong interpersonal links, such that agreeable people are more likely to spend time with friends (Wrzus et al., 2016), are less likely to argue with others (Mehl et al., 2006), and are more likely to be judged as friendly by interaction partners (Back et al., 2009). Finally, openness is negatively related to situations involving TV watching and positively related to situations involving computer/internet use, reading, and sports (Rohrer & Lucas, 2018). Indeed, personality traits map onto average measures of situation experience (Sherman et al., 2015), suggesting that personality traits predict differences in situation experience frequency.

Examining within-person differences in the frequency of situation experience within a day or week time frame is a key benefit of studies using experience sampling or other daily diary methodologies. These environmental factors directly impact situation experience; time of day cause significant within-person variability in situation experience (Harari et al., 2019) and

individuals are more likely to select into certain situations on weekends and others on weekdays (Bureau of Labor Statistics, 2019). Greater variability in personality states and affective states also impact the variability of situation experience at a momentary level (Wilson et al., 2016) and situation experience and personality states each independently predict affect and behavior in daily life (Sherman et al., 2015). Within-person variability in the frequency of situation experience over longer time frames is synonymous with lower *stability* of situation experience. Although differences in situation frequency at the within-person and between-person levels across short time scales (e.g., two weeks, one month) have been investigated, there is a dearth of literature on the long-term stability of situation experiences. Below, I outline some relevant prior research and possible results of this work.

Stability

As outlined above, research stemming from taxonomies of situations suggests that people experience situations differently from one another (Parrigon et al., 2017; Rauthmann, Sherman, Nave, et al., 2015). Although this research suggests that individual differences in situation experiences are meaningfully related to personality, these cross-sectional results cannot speak directly to whether differences in situation experiences are stable over time. Some research suggests that individual differences in situation experiences are stable over short periods of time (Rauthmann et al., 2016), but no longitudinal, measurement-burst study has been conducted on this topic. Although recent predictive models of location (relying on GPS data) suggest that patterns of movement are stable over time (Sadilek & Krumm, 2012), less is known about the stability of more psychologically-relevant features of situations (e.g., being with friends vs. being in class). As such, there is currently limited evidence regarding whether features of situations are stable in daily life.

Why do we know so little about the stability of situation experiences? For one, very few longitudinal studies of daily life have been conducted (cf. Baird, Le, & Lucas, 2006; Csikszentmihalyi & Larson, 1987; Larson, Moneta, Richards, & Wilson, 2002; Weinstein, Mermelstein, Hankin, Hedeker, & Flay, 2007), given the intensive nature of such data collection. Further, research on situations has previously been conducted in piecemeal ways, wherein one type of situation or construal is examined at a time (Reis, 2008). Though this project lacks a broadly shared framework for studying situations, it will certainly be the most comprehensive test of the stability of situation experiences that has yet been conducted.

Evaluating the stability of situation experiences is of great theoretical and practical importance for psychology. There are several broad potential outcomes of this research, each with different implications for social and personality research. If situation experiences are as stable as personality states, then there is good reason to suspect that personality stability is reinforced by situation stability, and vice versa. We could extrapolate further to say that personality states and situation experiences are driven by similar psychological mechanisms, reinforcing the idea that situation selection is driven by the need to express relevant personality states. Although there are more external constraints on situation experiences, individuals can adapt to these constraints and find ways to subvert them (e.g., if a highly extraverted individual is quarantined at home during a pandemic, they might schedule several video chats and calls with friends and family and spend more time on social media).

Another possible outcome of this research is that situation experiences are relatively stable, but less stable than situation experiences. This outcome would still suggest that the stability of personality contributes to the stability of situation experiences, but that the external constraints on situation experience hinders their stability. For example, although we can select

into situations that are consistent with our personality, we are not always able to do so. Particularly in the present college student sample, participants are encouraged to select into situations outside of their comfort zone and may even be required to do so to complete their degree (e.g., course requirements outside of a student's major).

But what if we find that situation experiences are not stable at all? This result would suggest that although individuals express personality states consistently over time, the characteristics of the situations they experience are not stable. In the present college student sample, students take different classes every term, with different demands on their schedule and changes in living situations happening potentially multiple times a year. Although there may be stability in broader situation characteristics (i.e., the DIAMONDS characteristics), there may be little to no stability in the activities they do. For non-college-age adults, we might imagine that they have more control over the situations they select into and should show some stability in situation experiences. However, if personality isn't expressed through situation selection and experience (and is instead expressed through affective experience or the cognitive construal of a situation), then we might expect little to no stability in situation experience. This result would challenge a great deal of assumptions in social and personality psychology, which contend that situation selection and experiences are expressions of personality states. If personality cannot predict what a person does or what situations they experience, what is it for? Though this research does not investigate this question with a comprehensive range of situation variables, observing little to no stability in these situation variables would be a surprising result that would challenge our working definition of personality.

Finally, one possible outcome of this study is that situation experiences are found to be more stable than personality states. Given the aforementioned external constraints on situation

experiences and the strength of self-report effects, this would be another surprising result. This result would suggest that people select into and experience situations in very consistent ways but express a range of personality states in a given situation. For example, an individual might express a more extroverted personality state in one class in which they are giving a presentation but might express a less extroverted personality state in a class in which they are watching a classmate give a presentation. This result could suggest that a person can interact with the same situation in a variety of ways, and that certain constellations of personality traits might produce a range of behavior within the same situation.

If individual differences in situation experiences are not at least moderately stable, then it follows that situation stability does not drive the stability we know exists for personality traits, and personality is not an important driver of situation selection (Emmons & Diener, 1986; Roberts & DelVecchio, 2000). Moreover, understanding the stability of people's situation experiences would have important implications for applied research aimed at intervening on stable behavioral patterns. Although interventions typically focus on changing people's internal states, such interventions will be less effective to the extent that one's environment remains stable.

Variation in stability. Given the demanding nature of situation research, there is little research on individual differences in situation stability. Theories of lifespan development suggests that the more constraints there are in an individual's environment, the more selective they are of the situations they experience; because more potent constraints (e.g., inhibited cognitive functioning) and fewer situational possibilities (e.g., living in a remote location) limits the range of situations that one can select into (Baltes & Baltes, 1990; Heckhausen et al., 2010). Therefore, individuals with fewer situational experiences available to them (e.g., older adults)

should exhibit more stability in situation experiences than younger adults. Recent research suggests that within a three-week time period, older adults exhibit slightly less variability in the individuals around them than middle-age or young adults, but are not significantly different in the variability of their activities (Wrzus et al., 2016).

The Present Research

What is being studied? There are two points on which the value of this project could be disputed: (1) this project is a secondary data analysis of data not specifically designed to test this question and (2) the primary variables of interest do not fit into a pre-established framework or taxonomy. Specifically, one could debate the extent to which these are measures of situations rather than behavior, affect, or even personality states. Although it is far from clear-cut what to label the concepts I am studying here, and reasonable researchers can (and do) disagree about what to call these constructs, I believe the most appropriate term for the phenomena under investigation here is: situation experiences. Although these data do not fit neatly into an established taxonomy or survey of situation experiences¹ (Edwards & Templeton, 2005; Parrigon et al., 2017; Rauthmann et al., 2014; Yang et al., 2006), these data provide an important first step in tackling the stability of situation experiences and should be supplemented by additional research, and ultimately confirmed in a pre-registered, confirmatory study.

Overview and research questions. I used two measures of daily experience to examine the stability of situation characteristics: ESM surveys and ESM open responses. These methods differ in important ways. The ESM survey questions on situation experiences were developed

¹ Three of the six ESM survey items measuring situation experiences used in this study overlap with items used by Fleeson (2007) to examine variability in personality states relative to variability in situation characteristics. These situation characteristics were measured via the following items: “In this situation, were you free to behave however you wanted?”, “How well did you know [your interaction partners]?”, and “Compared to them, how much power/social status do you have?”. The ESM checklist items were created by the study authors based on their intuitions about what would be relevant for this sample (college students at a private university).

using researcher's intuitions of what situations are commonly experienced by college students in this sample. The ESM open response asks: "In a few words, what were you doing in the last hour?". The open responses were coded by independent raters for the situational eight DIAMONDS characteristics, which provides a wider breadth of situation experience measures that fit with the current body of situation research.

The central question of this study is examining the stability of situation experiences. Understanding the stability of psychologically relevant constructs is important for both theoretical and psychometric purposes and has important implications for personality psychology and related disciplines. In addition to this central research question, there are several ancillary questions that I will strive to answer: (1) how frequently do individuals experience a range of social situations? (2) how much variation in stability exists between characteristics of situation experience? and (3) are personality states more stable than situation experiences (or vice versa)? The first question is primarily descriptive, of interest given the richness of the current data. The second question addresses the possibility that certain characteristics of situation experiences will be more stable than others. The third question investigates the theoretical implications of differing levels of stability between personality and situation experiences.

Method

The collection and coding of the data presented here were approved by Institutional Review Boards at Washington University in St. Louis (IRB ID: 201206090; Study Title: Personality and Intimate Relationships Study) and University of California, Davis (IRB ID: 669518-15; Study Title: Personality and Interpersonal Roles Study). The PAIRS study (Vazire et al., 2019) is an intensive, two-year longitudinal study of personality, relationships, and behavior. Several published papers have utilized this dataset (for a full list of citations,

see <https://osf.io/3uag4>), but excepting descriptive statistics of average personality states, the “interacted with close friend” item at Year 1 (Sun et al., 2019; Wilson et al., 2015), and the coded DIAMONDS characteristics for Year 1 (Breil et al., 2019), the following analyses have not been published. This dataset included three intensive waves of measurement: baseline (Year 1), one year later (Year 2), and two years later (Year 3) with smaller waves in between (which will not be discussed here). At each of these three time points, participants completed two weeks of Experience Sampling Method (ESM; Csikszentmihalyi & Larson, 1987), among other measures not discussed here (see <https://osf.io/akbfj/> for complete codebook).

Participants

Participants were recruited at a large private university in the Midwest ($N = 434$). At each wave, only participants who completed $n \geq 5$ ESM surveys were included in our analyses (this inclusion criterion was determined before data analysis on this project began). The first wave of the study included $N = 434$ participants total, and $N = 387$ met our inclusion criteria. Year 2 contained $N = 207$ participants total, and $N = 166$ met our inclusion criteria. In Year 3 $N = 134$ participated, and $N = 89$ met our inclusion criteria. A total of $N = 71$ participants completed $n \geq 5$ ESM surveys at all three waves. For the analyses involving DIAMONDS characteristics, $N = 166$ participants completed ≥ 5 ESM surveys in which they reported interacting with at least one other person. I report attrition analyses below.

Due to sample attrition, the sample size for this secondary data analysis is too small to calculate precise estimates of small effects. The models reported below allowed for missing data, which meant that many of these estimates are based on the larger sample of people who had at least two waves of data ($N = 108$). As the power analyses below illustrate, this sample size provides adequate power to detect typical stability effects found in ESM-based studies of

personality states – the best available basis for estimating the expected effect size for the stability of situation experiences.

At Year 1, participants ranged in age from 18 to 32 ($M = 19.32$, $SD = 2.03$) and 67.8% were female. The ethnic breakdown of the sample at Year 1 was 55.7% White, 24.1% Asian, 10.6% Black, 7.0% Hispanic, and 9.1% mixed race or other. Of the participants who participated in all three waves, 76% were female.

Procedure

Year 1 of the study began with a laboratory session lasting around two hours, during which participants completed several tasks unrelated to the current research questions. Following the laboratory session, participants consented to receiving ESM surveys for two weeks (among other tasks). Participants were paid \$20 for completing the laboratory session for each wave and were also entered into a lottery to win \$100 each time they completed an ESM survey. The same procedure, with the same compensation opportunities, was repeated (with small variations in the unrelated tasks) in Years 2 and 3.

ESM. In all three waves, participants began completing ESM surveys (max. $n = 59$ surveys at each wave) after the first laboratory session, which was held on a Friday. Participants were emailed surveys four times per day for 14-15 days. Participants reported on aspects of the situation they were in, and their behavior, mood, and personality during the hour just before the survey was sent (e.g., “From 5pm to 6pm, how quiet were you?”).

Participants were sent surveys at 12:00 pm, 3:00 pm, 6:00 pm, and 9:00 pm; with questions referring to the previous hour (i.e., 11:00 am–12:00 pm, 2:00 pm–3:00 pm, 5:00 pm–6:00 pm, 8:00 pm–9:00 pm). In addition to the emails containing the survey links, participants were sent text messages reminding them to complete the surveys. The surveys took 3 to 4

minutes to complete. Participants could complete the surveys on any device with access to the internet. In Year 1, 71.8% of participants owned a smartphone, but there was no significant relationship between owning a smartphone and completing ESM surveys ($r = -.04$, $p = .54$; Wilson et al., 2015).

In Year 1, participants completed 15,563 surveys in total (average $n = 29.55$ surveys per participant). Participants in Year 2 completed 4,145 surveys (average $n = 24.81$ surveys per participant), and participants in Year 3 completed 1,446 surveys (average $n = 15.19$ surveys per participant).

Data Exclusions

For ESM survey and open response data, I employed a priori exclusion criteria for data quality purposes (e.g., Finnigan & Vazire, 2017; Wilson et al., 2015). Surveys were not included in these analyses if: (1) they were completed more than three hours after the link was sent; (2) the participant indicated that they were sleeping during the specified hour; (3) less than 75% of items on the survey were completed; (4) the participant gave the same response for 70% or more of the items. As noted above, I did not include participants' responses for a particular wave if they did not complete at least 5 ESM surveys during that wave. $N = 11,460$ surveys remained for Year 1; $N = 4,071$ surveys remained for Year 2; and $N = 1,352$ surveys remained for Year 3.

Materials

State situation experience. Participants provided self-reports of situation experiences as part of the ESM surveys. I report all items that were assessed at all measurement points and categorize them as activities or situated experiences. Activities and situated experiences were each measured using a face-valid single item that was developed specifically for this study, but

not specifically for the purpose of assessing the stability of social environments. The phrasing of each item is listed in Appendix A.

Situated experiences and activities. Situated experiences were measured using a dimensional approach (e.g., “How stressful was the situation?”, “How much do you like [your interaction partner(s)]?”) on a 5-point Likert-type scale (1 = *Not at all*, 3 = *Somewhat*, 5 = *Very*). These items were designed to capture subjective aspects of the situation, including how the participant construed the situation. Descriptive statistics for these variables are shown in Table 1.

Activities were measured using checklist items (e.g., “Stayed mostly in your room/house”, “Went to class”). These were mostly situations that the study authors expected to be relatively common among college students, and more objective than situated experiences. Participants indicated whether or not they were in that situation during the specified hour by checking the box or leaving it unchecked. Descriptive statistics are shown in Table 2.

Table 1

Descriptive statistics for ESM measures of situated experiences aggregated for each person at each year

	Year 1		Year 2		Year 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Knowing	3.61	0.52	3.75	0.59	3.65	0.55
Liking	4.11	0.43	4.20	0.43	4.15	0.44
Stressful	2.03	0.49	2.02	0.51	1.95	0.49
Common/familiar	3.90	0.46	4.01	0.49	4.01	0.53
Free to behave	3.51	0.48	3.48	0.53	3.34	0.59

Note. ESM = experience sampling method. All variables were assessed on a 1 to 5 Likert-type scale. All ESM reports were collected over two weeks at each wave and were aggregated within-person to create a mean score for each person at each year. The means and standard deviations reported here are for these between-person aggregated variables.

Table 2

Descriptive statistics for ESM measures of activities aggregated for each person at each year

	Year 1		Year 2		Year 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Interacting	0.75	0.17	0.71	0.18	0.72	0.21
Around others	0.81	0.14	0.80	0.15	0.78	0.18
On phone/Skype	0.06	0.08	0.05	0.07	0.04	0.07
Group vs. 1-on-1	0.71	0.18	0.65	0.21	0.63	0.24
Interacted with close friend	0.36	0.20	0.30	0.20	0.29	0.20
Stayed in room/home	0.31	0.16	0.32	0.19	0.29	0.21
Studied/worked	0.41	0.17	0.49	0.22	0.41	0.20
Listened to music	0.23	0.17	0.27	0.19	0.18	0.18
Watched TV/movie	0.11	0.12	0.14	0.14	0.13	0.14
Went to class	0.17	0.11	0.20	0.14	0.20	0.18

Note. ESM = experience sampling method. All variables were checklist items collected over two weeks of ESM at each wave. The means here can be interpreted as the percentage of experience sampling surveys in which the participant reported being in that situation. The “Group vs. 1-on-1” variable refers to the percentage of group interactions (i.e., the participant interacted with more than two people) as a percentage of all responses in which the participant reported interacting with at least one other person, not out of all responses the participant provided. All ESM reports were aggregated within-person to create a mean score for each person at each wave.

The means and standard deviations reported here are for these between-person aggregated variables.

Open responses and DIAMONDS coding. At the beginning of each ESM survey, participants responded to an open response item asking: “In a few words, what were you doing in the last hour?” followed by a text box. There were no limits on the number of words or sentences for these responses. Breil and colleagues (2019) coded ESM open responses for Year 1, using three independent raters for all surveys. A separate team of eight independent raters coded ESM responses for Year 2; each survey was rated by three independent raters. DIAMONDS characteristics were coded for using the S8-II (Rauthmann & Sherman, 2016a), a brief eight-item measure recommended for coding situational stimuli (e.g., text, audio recordings, videos).

A single item was used to measure each DIAMONDS characteristic (i.e., “The situation contains: “work, tasks, duties” [Duty], “intellectual, aesthetic, profound things” [Intellect], “threat, criticism, accusation” [Adversity], “romance, sexuality, love” [Mating], “positive, pleasant, nice things” [pOsitivity], “negative things, unpleasant things, bad feelings” [Negativity], “deceit, lies, dishonesty” [Deception], “communication, interaction, social relationships” [Sociality]. For each characteristic, each response was rated on a Likert-type scale from 1 (*does not apply at all*) to 7 (*applies perfectly*). In the Year 1 coding process, raters only rated responses for surveys in which the participant indicated that they were interacting with another person; this decision was made because the researchers coordinating the coding in Year 1 were primarily interested in social interactions. In the Year 2 coding process, all open responses were coded, regardless of whether or not the participant interacted with other people. However, for consistency, I excluded surveys in Year 2 where the participant did not indicate

that they were interacting with another person. Further, pOsitivity and Negativity were highly correlated in both Year 1 and Year 2 (Year 1: $r = -.93, p < .001$; Year 2: $r = -.81, p < .001$), so I computed one pOsitivity vs. Negativity score (Negativity ratings subtracted from pOsitivity ratings) for a more parsimonious and less redundant representation of situational ratings (see Breil et al., 2015). Descriptive statistics for all characteristics are presented in Table 3.

There are some important discrepancies to note between the DIAMONDS open-end coding processes in Year 1 versus Year 2. In the Year 2 coding process, coders were instructed to pay strict attention to the distinction between the Duty and Intellect characteristics described by Rauthmann et al., (2014), where Duty is more closely related to “work/achievement affordances”, and Intellect is more closely related to “intellectual” and “creative” affordances. As a result, Year 1 coders were more likely to code situations like “In class” and “Doing stats homework” as higher on Intellect than Year 2 coders were, leading to lower Intellect ratings in Year 2 (see Table 3). Further, some situation characteristics (i.e., Adversity, Deception) were very rare in both the Year 1 and the Year 2 sample, and do not correlate at all from Year 1 to Year 2. Despite these irregularities and discrepancies in coding for Intellect, Adversity and Deception, I will present the results for all eight DIAMONDS characteristics.

Table 3

Descriptive statistics for coded DIAMONDS characteristics aggregated for each person at each year

	Year 1		Year 2	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Duty	3.99	0.81	4.13	0.91
Intellect	3.63	0.64	1.80	0.35
Adversity	1.45	0.12	2.04	0.32
Mating	1.25	0.29	1.21	0.34
pOsitivity	4.12	0.50	3.69	0.50
Negativity	2.75	0.45	2.64	0.53
Deception	1.14	0.07	1.15	0.13
Sociality	4.15	0.49	3.65	0.76
pOsitivity vs. Negativity	1.37	0.93	1.05	0.98

Note. All variables were coded on a 1 to 7 Likert-type scale. Each experience sampling (ESM) open response was coded by three independent coders. All ESM reports were collected over two weeks at each wave and were aggregated within-person to create a mean score for each person at each wave. The means and standard deviations reported here are for these between-person aggregated variables. The pOsitivity vs. Negativity variable is the average of the difference between pOsitivity and Negativity (Negativity subtracted from pOsitivity). As noted above, there were discrepancies in how Intellect was operationalized between Year 1 and Year 2, so the mean difference between Years for this variable are not easily interpretable.

State personality. Participants provided self-reports of their state personality as part of the ESM surveys. State personality was assessed using a subset of items from the Big Five Inventory (BFI-44; John & Srivastava, 1999). State extraversion, agreeableness,

conscientiousness, and neuroticism were measured at all waves. Prior to beginning data collection for Year 1, the study authors decided agreeableness should only be assessed when the participant indicated that they interacted with another person, due to the interpersonal nature of the trait (Graziano & Eisenberg, 1997). The motivation behind this decision was to reduce the number of meaningless state self-reports provided (i.e., when the personality construct is not relevant to the situation). State openness was not assessed in Year 1 or Year 2 because the study authors believed that openness items on the BFI were more trait-like and would not translate well to a state measure. After Year 2, the authors' opinions on this matter changed and state openness was measured in Year 3. However, given that these analyses focus on the stability of state personality, I will not report any results for openness.

Every ESM survey included 7 or 9 BFI items (e.g., "From 5pm to 6pm, how ...were you?: "quiet" [Extraversion, reverse coded]; "rude" [Agreeableness, reverse coded]; "reliable" [Conscientiousness]; "worried" [Neuroticism]). The agreeableness items were only included if the participant indicated that they interacted with another person. For extraversion, agreeableness, and conscientiousness, participants rated one positively keyed and one reverse-keyed item per trait; for neuroticism, participants rated two positively keyed items and one reverse-keyed item. Participants rated these items on a Likert-type scale (1 = *Not at all*, 3 = *Somewhat*, 5 = *Very*). Descriptive statistics are shown in Table 4.

Table 4

Descriptive statistics for state ESM measures of personality states aggregated for each person at each year

	Year 1		Year 2		Year 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Extraversion	2.80	0.47	2.68	0.50	2.68	0.53
Agreeableness	3.99	0.42	3.96	0.43	3.88	0.47
Conscientiousness	3.60	0.49	3.63	0.51	3.63	0.55
Neuroticism	2.40	0.52	2.21	0.48	2.20	0.45

Note. ESM = experience sampling method. All variables were assessed on a 1 to 5 Likert-type scale. All ESM reports were collected over two weeks at each wave and were aggregated within-person to create a mean state score for each person at each wave. The means and standard deviations reported here are for these between-person aggregated state variables. Openness was only measured at Year 3, and so is not included in these analyses.

Attrition Analyses

From Year 1 to Year 2, $n = 210$ total participants dropped out of the ESM portion of the study (almost all of whom also did not participate in other portions of the study), and $n = 73$ total participants dropped out between Year 2 and Year 3. I tested for differences in age, gender, race, global personality traits, and average personality states at Year 1 between participants who completed 5 or more ESM surveys at Year 1 but did not participate in any other waves, and participants who completed 5 or more ESM surveys at Years 2 and 3. I computed all effect sizes using the *compute.es* package in R Statistical Software (Del Re, 2013). Note that power and precision for these analyses is low and so there are likely differences I was not able to detect. In

regard to the demographic variables, I found no differences for racial/ethnic identification and age but did find that men dropped out a greater rate than did women ($\chi^2(1) = 5.32, p = .02, d = 0.24, 95\% \text{ CI} = [0.03, 0.44]$). Additionally, participants who dropped out after Year 1 completed fewer surveys in Year 1 ($M = 27.61$) than those who remained in the study ($M = 38.15; t(386) = -5.47, p < .001, d = -0.72, 95\% \text{ CI} = [-0.98, -0.46]$). In regards to personality differences, I found that participants who dropped out were significantly lower on both trait conscientiousness ($t(383) = -2.54, p = .01, d = -0.33, 95\% \text{ CI} = [-0.59, -0.08]$) and average (ESM-based) state conscientiousness ($t(386) = -2.89, p = .004, d = -0.38, 95\% \text{ CI} = [-0.64, -0.12]$) than those who remained in the study. I also found that participants who dropped out were significantly lower in their levels of both trait agreeableness ($t(383) = -2.25, p = .02, d = -0.30, 95\% \text{ CI} = [-0.55, -0.04]$) and average state agreeableness ($t(383) = -2.17, p = .03, d = -0.29, 95\% \text{ CI} = [-0.54, -0.03]$).

Due to these significant differences in personality between those who dropped out of the study after Year 1 and those who remained for the subsequent waves, I examined if the key variables of interest — the aggregated situation experiences — differed between the two groups. I found only one close-to-significant difference between participants who dropped out after Year 1 and participants who remained in the study in these aggregated situation experiences: those who dropped out had a marginally lower aggregate of liking their interaction partner/s ($t(386) = -1.89, p = .06, d = -0.25, 95\% \text{ CI} = [-0.51, 0.01]$).

These analyses suggest that, like many longitudinal studies, attrition may affect the generalizability of these analyses. Moreover, this sample was far from representative to begin with, given that the participants were students at a very selective private university. Thus, these results should be interpreted as applying to a narrow population. Importantly, the evidence

suggests that attrition was not strongly associated with the variables in the key analyses: the participants' situation experiences.

Power Analysis

Due to the lack of longitudinal intensive studies of situations, I did not have an a priori estimate of the stability of situations. However, I used a previous study of the stability of ESM-assessed average personality states (Baird et al., 2006) as a benchmark for the anticipated stability of ESM-assessed aggregated situations. The average 1-year stability for the Big Five traits, as obtained by Baird and colleagues (2006) was equal to mean $\beta = .76$. I performed a power analysis to estimate power to detect an effect of this magnitude, with a sample of $N = 108$ (participants who had at least two waves of data) and $\alpha = .05$. I completed this analysis using the *pwr* package in R Statistical Software (Champely, 2016). With a sample of $N = 108$, I have more than 99% power to detect a β of .76 at $p < .05$ and at $p < .005$. I also found that a sample of $N = 108$ has 80% power to detect a correlation of $r = .27$ or larger and 90% power to detect a correlation of $r = .31$ or larger at $p < .05$. At $p < .005$, a sample of $N = 108$ has 80% power to detect a correlation of $r = .34$ and 90% power to detect a correlation of $r = .38$. As such, I believe this sample size is appropriate for detecting stability effects, although it will have limited precision in effect size estimation.

Results

All analyses were performed in R Statistical Software (Version 3.6.0), and all structural equation models were performed using the *lavaan* package in R Statistical Software (Rosseel, 2012). The R script for the analyses and the data file will be available on the OSF following anonymization of the data.

To examine the rank-order stability of participants' situation experiences and state personality from year to year, I first aggregated people's ESM reports for each construct at each wave and then used the "average state" variables in subsequent analyses. I then constructed autoregressive structural equation models for each construct, with the average state at Year 1 predicting the average state at Year 2, and the average state at Year 2 predicting the average state at Year 3. I also included a direct path between Year 1 to Year 3 to estimate the two-year stability of each variable. This model is illustrated in Figure 1.

Figure 1. Example path diagram for each autoregressive structural equation model. Each indicator represents an aggregate of a portion of ESM surveys.

I specified latent variables for each construct at each wave. For features of situations, I separated the ESM surveys (max. $n = 59$ surveys) into three parcels based on time point in the

study (i.e., in Parcel 1, hour blocks 1, 4, 7, [...]; in Parcel 2: hour blocks 2, 5, 8, [...]; in Parcel 3, hour blocks 3, 6, 9, [...]), and took the average across each group of surveys to get three average situation experience indicators. The same procedure was completed for personality states, but I first averaged across the 2-3 personality items and then grouped the surveys together, as in Finnigan and Vazire (2017). I used full-information maximum likelihood estimation for all models and constrained the factor loadings for all parcels at within wave to be equal. Most models met or came close to established thresholds for fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003: CFI > .95, RMSEA < .06, SRMR < .08), and all models achieved configural invariance. The correlations among average personality states, situated experiences, activities, and DIAMONDS characteristics across all waves are available at <https://osf.io/x27g8/>.

In this section, I will report on two sets of analyses for each set of variables. First, I will report the results of the autoregressive models. Next, I will report on the stability correlation coefficients for each variable. Finally, I will compare the average bootstrapped correlation coefficients for each set of variables.

Stability of Personality States

I first report the stability of individual differences in personality states. Table 5 presents the stability coefficients and fit statistics for the autoregressive models for average personality states. Table 6 contains the simple effects for each personality state between each of the three time points. All Big Five constructs examined had similar stability coefficients, ranging from $\beta = .74$ (neuroticism) to $\beta = .80$ (conscientiousness) from Year 1 to Year 2, and $\beta = .41$ (extraversion) to $\beta = .97$ (conscientiousness) from Year 2 to Year 3. Overall, these coefficients are comparable to existing estimates of the stability of average states over 1 year (Baird et al., 2006) and global personality traits over 3 years (Costa & McCrae, 1988; Robins et al., 2001).

These results provide an important replication of this effect – to my knowledge it is only the second study to examine the stability of average personality states over several years (Baird et al. being the first). For the direct paths between Year 1 and Year 3 coefficients ranged widely from $\beta_3 = -.06$ (conscientiousness) to $\beta_3 = .47$ (extraversion). Extraversion and agreeableness showed a greater degree of two-year stability than conscientiousness and neuroticism.

Overall, the correlation stability coefficients show similar patterns to the autoregressive stability coefficients. All personality states were similarly stable over one year (Year 1 to Year 2 *Mean r* = .63; Year 2 to Year 3 *Mean r* = .63), and slightly less stable over two years (Year 1 to Year 3 *Mean r* = .58).

Table 5

Autoregressive models for the stability of average personality states

	Y1 – Y2	Y2 – Y3	Y1 – Y3	IE	Model fit			
	β_1	β_2	β_3	$\beta_1 * \beta_2$	$\chi^2 (30, 387)$	CFI	RMSEA	SRMR
Extraversion	.74	.41	.47	.31	47.85	0.955	0.039	0.086
Agreeableness	.75	.51	.33	.38	49.95	0.983	0.041	0.080
Conscientiousness	.80	.97	-.06	.77	35.74	0.994	0.022	0.073
Neuroticism	.72	.73	.13	.53	27.13	1.000	0.000	0.059

Note. β_1 refers to the standardized stability coefficients between Year 1 and Year 2; β_2 refers to the slope between Year 2 and Year 3. “Y1 – Y2” = Year 1 to Year 2; “Y2 – Y3” = Year 2 to Year 3; “CFI” = comparative fit index; “SRMR” = standardized root mean square residual; “RMSEA” = root mean square error of approximation. All models are structural equation models with three latent variables with three parcels each. All betas are standardized.

Table 6

Correlations between ESM measures of personality states from year-to-year

	Y1-Y2	Y2-Y3	Y1-Y3
	<i>r</i>	<i>r</i>	<i>r</i>
Extraversion	.53	.41	.49
Agreeableness	.69	.69	.63
Conscientiousness	.70	.75	.61
Neuroticism	.62	.71	.54

Note. ESM = experience sampling method. All variables were assessed on a 1 to 5 Likert-type scale. All ESM reports were collected over two weeks at each wave and were aggregated within-person to create a mean score for each person at each year. The means and standard deviations reported here are for these between-person aggregated variables.

Stability of Situation Experiences

Next, I conducted the key analysis of this study: how stable are individual differences in situation experiences? As stated above, I grouped situations into situated experiences (e.g., stressful, familiar), activities (e.g., watching TV, in class), and DIAMONDS characteristics (e.g., Duty, Sociality). Tables 7, 8, and 9 present the results of the autoregressive models for situation experiences, activities, and DIAMONDS characteristics respectively. I also present the simple correlation coefficients between each time point for situation experiences, activities, and DIAMONDS characteristics in Tables 10, 11, and 12 respectively. For each construct, I will first describe the autoregressive modeling findings, then I will describe the simple stability coefficients.

Table 7

Autoregressive models for the stability of average state measures of situated experiences

	Y1 – Y2	Y2 – Y3	Y1 – Y3	IE	Model fit			
	β_1	β_2	B_3	$\beta_1 * \beta_2$	$\chi^2 (30, 387)$	CFI	RMSEA	SRMR
Knowing	.80	.62	.16	.49	39.84	0.959	0.029	0.087
Liking	.86	1.00	-.25	.86	41.57	0.975	0.032	0.102
Stressful	.89	.34	.38	.30	27.28	1.000	0.000	0.075
Common/familiar	.81	.21	.69	.17	52.46	0.951	0.044	0.077
Free to behave	.78	.81	.07	.64	30.23	0.999	0.004	0.067

Note. β_1 refers to the slope between Year 1 and Year 2; β_2 refers to the slope between Year 2 and Year 3; β_3 refers to the slope between Year 1 and Year 3. “IE” = Indirect Effect; $\beta_1 * \beta_2$ refers to the product of β_1 and β_2 . “Y1 – Y2” = Year 1 to Year 2; “Y2 – Y3” = Year 2 to Year 3; “Y1 – Y3” = Year 1 to Year 3; “CFI” = comparative fit index; “SRMR” = standardized root mean square residual; “RMSEA” = root mean square error of approximation. All models are structural equation models with three latent variables with three parcels each. All betas are standardized, betas greater than 1 indicate the presence of multicollinearity.

Table 8

Autoregressive models for the stability of average state measures (frequencies) of activities

	Y1 – Y2	Y2 – Y3	Y1 – Y3	IE	Model fit			
	β_1	β_2	β_3	$\beta_1 * \beta_2$	χ^2 (30, 387)	CFI	RMSEA	SRMR
Interacting	.75	.33	.69	.25	53.25	0.945	0.045	0.099
Around others	.78	1.42	-.29	1.11	51.85	0.934	0.043	0.113
On phone/Skype	.50	.09	.86	.05	39.96	0.932	0.029	0.113
Group vs. 1-on-1	.70	.30	.58	.21	26.21	1.000	0.000	0.064
Interacted with close friend	.63	.35	.49	.22	41.58	0.975	0.032	0.075
Stayed in room/home	.51	.17	.51	.08	43.26	0.942	0.034	0.099
Studied/worked	.51	.58	.04	.29	43.02	0.953	0.033	0.080
Listened to music	.79	1.13	-.18	.89	54.47	0.943	0.046	0.125
Watched TV/movie	.68	.84	-.07	.57	47.43	0.957	0.039	0.106
Went to class	.44	.29	.06	.13	42.47	0.941	0.033	0.081

Note. β_1 refers to the slope between Year 1 and Year 2; β_2 refers to the slope between Year 2 and Year 3; β_3 refers to the slope between Year 1 and Year 3. “IE” = Indirect Effect; $\beta_1 * \beta_2$ refers to the product of β_1 and β_2 . “Y1 – Y2” = Year 1 to Year 2; “Y2 – Y3” = Year 2 to Year 3; “Y1 – Y3” = Year 1 to Year 3; “CFI” = comparative fit index; “SRMR” = standardized root mean square residual; “RMSEA” = root mean square error of approximation. All models are structural equation models with three latent variables with three parcels each. All betas are standardized, betas greater than 1 indicate the presence of multicollinearity.

Table 9

Autoregressive models for the stability of average state measures (frequencies) of DIAMONDS situational characteristics

	Y1 – Y2	Model fit			
	β	χ^2 (12, 387)	CFI	RMSEA	SRMR
Duty	.37	8.04	1.000	0.000	0.046
Intellect	.08	23.92	0.900	0.051	0.072
Adversity	.12	11.05	1.000	0.000	0.043
Mating	.19	29.17	0.927	0.061	0.097
pOsitivity	.64	18.74	0.925	0.038	0.065
Negativity	.56	12.90	0.991	0.014	0.066
Deception	.60	34.16	0.312	0.069	0.093
Sociality	1.02	19.63	0.944	0.041	0.071
Positivity vs. Negativity	.62	12.81	0.991	0.013	0.060

Note. β refers to the slope between Year 1 and Year 2; “Y1 – Y2” = Year 1 to Year 2; “CFI” = comparative fit index; “SRMR” = standardized root mean square residual; “RMSEA” = root mean square error of approximation. All models are structural equation models with two latent variables with three parcels each. The loadings of all three parcels within each latent variable are constrained to be equal. All betas are standardized; betas greater than 1 indicate the presence of multicollinearity. The pOsitivity vs. Negativity variable is the average of the difference between pOsitivity and Negativity (Negativity subtracted from pOsitivity).

Table 10

Correlations between ESM measures of situated experiences from year-to-year

	Y1-Y2	Y2-Y3	Y1-Y3
	<i>r</i>	<i>r</i>	<i>r</i>
Knowing	.43	.37	.31
Liking	.59	.39	.38
Stressful	.66	.46	.43
Common/familiar	.58	.58	.55
Free to behave	.52	.58	.53

Note. ESM = experience sampling method. All variables were assessed on a 1 to 5 Likert-type scale. All ESM reports were collected over two weeks at each wave and were aggregated within-person to create a mean score for each person at each year. The means and standard deviations reported here are for these between-person aggregated variables.

Table 11

Correlations between ESM measures of activities from year-to-year

	Y1-Y2	Y2-Y3	Y1-Y3
	<i>r</i>	<i>r</i>	<i>r</i>
Interacting	.52	.53	.63
Around others	.50	.63	.47
On phone/Skype	.21	.14	.29
Group vs. 1-on-1	.44	.37	.39
Interacted with close friend	.48	.34	.38
Stayed in room/home	.37	.32	.43
Studied/worked	.31	.11	.18
Listened to music	.53	.63	.47
Watched TV/movie	.45	.61	.44
Went to class	.30	.24	.13

Note. ESM = experience sampling method. All variables were assessed on a 1 to 5 Likert-type scale. All ESM reports were collected over two weeks at each wave and were aggregated within-person to create a mean score for each person at each year. The means and standard deviations reported here are for these between-person aggregated variables.

Table 12

Stability coefficients for average state measures (frequencies) of DIAMONDS situational characteristics

	Y1 – Y2
	<i>r</i>
Duty	.25
Intellect	.03
Adversity	.02
Mating	.13
pOsitivity	.27
Negativity	.24
Deception	.03
Sociality	.44
Positivity vs. Negativity	.26

Note. *r* refers to the correlation between Year 1 and Year 2; “Y1 – Y2” = Year 1 to Year 2. The pOsitivity vs. Negativity variable is the average of the difference between pOsitivity and Negativity (Negativity subtracted from pOsitivity).

Situated experiences. For situated experiences, autoregressive stability coefficients between Year 1 and Year 2 ranged from $\beta_1 = .78$ (“did you feel free to behave however you wanted?”) to $\beta_1 = .89$ (“how stressful was the situation?”). Between Year 2 and Year 3, coefficients ranged from $\beta_2 = .21$ (“how common/familiar was the situation?”) to $\beta_2 = 1.00$ (“how much did you like [your interaction partner]?”). The direct effect between Year 1 and Year 3 ranged widely for situated experiences, from $\beta_3 = -.25$ (“how much did you like [your interaction partner]?”) to $\beta_3 = .69$ (“how common/familiar was the situation?”).

Correlation coefficients for situated experiences were more similar to each other compared to the autoregressive coefficients. Similar to personality states, activities were more stable from year to year (Year 1 to Year 2 *Mean r* = .56; Year 2 to Year 3 *Mean r* = .48) than across two years (Year 1 to Year 3 *Mean r* = .44).

Activities. Autoregressive stability coefficients for activities between Year 1 and Year 2 ranged from $\beta_1 = .41$ (“went to class”) to $\beta_1 = .79$ (“listened to music”). Between Year 2 and Year 3, autoregressive coefficients ranged from $\beta_2 = .09$ (“on phone/Skype”) to $\beta_2 = 1.42$ (around others). Across two years, activities were variable in their stability coefficients ranging from $\beta_3 = -.29$ (around others) to $\beta_3 = .86$ (“on phone/Skype”).

Correlation coefficients for situated experiences were more similar to each other compared to the autoregressive coefficients. Activities showed similar levels of stability across one year (Year 1 to Year 2 *Mean r* = .42; Year 2 to Year 3 *Mean r* = .41) and two years (Year 1 to Year 3 *Mean r* = .39).

DIAMONDS. For the DIAMONDS characteristics, I found a wide range of stabilities across all constructs. Due to coding issues and low base rates, the models for Intellect and Deception did not converge and are not included in the following analyses. Sociality was by far

the most stable characteristic from Year 1 to Year 2 ($\beta = 1.02$), followed by pOsitivity ($\beta = .64$), Positivity vs. Negativity ($\beta = .62$), Deception ($\beta = .60$), Negativity ($\beta = .56$), Duty ($\beta = .37$), Mating ($\beta = .19$), Adversity ($\beta = .12$), and Intellect ($\beta = .08$).

The correlation coefficients for the DIAMONDS characteristics were lower than the autoregressive coefficients, ranging from $r = .44$ (Sociality) to $r = .02$ (Adversity), with a mean $r = .19$. Lower frequency situations (e.g., Adversity, Deception) showed low stability across one year, while higher frequency situations in this sample showed greater stability (e.g., Sociality, pOsitivity, Duty).

Stability Comparisons

Finally, I also examined whether situated experiences, activities, and DIAMONDS characteristics differed in their levels of stability. First, I estimated the standardized all correlation coefficients for $B = 50$ bootstrapped. Then, I concatenated the bootstrapped estimates based on construct (e.g., personality states, activities) and time points (i.e., Year 1 to Year 2, Year 2 to Year 3, Year 1 to Year 3). Descriptive statistics for these combined bootstrapped estimates are presented in Table 13. I then compared the means of each group of coefficients by using the *psych* package in R Statistical Software to transform the average correlations into z-scores using Fisher's r-to-z transformation, and then conducted a z-test of the difference between the z-scores (Revelle, 2017).

First, I tested for the any differences between the stability of situation experiences and the stability of personality states. Situated experiences were less stable on average than personality states from Year 2 to Year 3 ($z = 2.26, p = .02$), but no significant differences were observed from Year 1 to Year 2 ($z = 1.16, p = .26$) or Year 1 to Year 3 ($z = 1.96, p = .05$). Activities were less stable on average than personality states from Year 1 to Year 2 ($z = 3.50, p < .001$),

Year 2 to Year 3 ($z = 3.65, p < .001$), and Year 1 to Year 3 ($z = 3.02, p < .003$). On average, the DIAMONDS characteristics were less stable than personality states ($z = 6.44, p < .001$) from Year 1 to Year 2.

Second, I compared the average stabilities of each category of situation experience. I found that the average stability coefficient for activities was weaker than the average stability of situated experiences from Year 1 to Year 2 ($z = 2.36, p = .02$). From Year 1 to Year 2, the DIAMONDS characteristics were less stable than situated experiences ($z = 5.55, p < .001$), and activities ($z = 3.93, p < .001$) on average.

I found no difference between the stability of situated experiences and activities from Year 2 to Year 3 ($z = 1.18, p = .24$) and Year 1 to Year 3 ($z = 0.87, p = .39$), though I refrain from interpreting these nonsignificant results because the sample size of these analyses hinders my ability detect small-to-medium differences.

Table 13

Descriptive statistics for bootstrapped ($B = 50$ per variable) correlation stability coefficients for each construct type

	<i>B</i>	<i>Stability M</i>	<i>Stability SD</i>	Minimum	Maximum
Year 1 – Year 2					
Personality	200	.63	0.08	0.31	0.80
Activities	500	.42	0.12	-0.01	0.67
Situated Experiences	250	.56	0.10	0.22	0.75
DIAMONDS	450	.19	0.16	-0.17	0.55
Year 2 – Year 3					
Personality	200	.63	0.17	0.11	0.86
Activities	500	.41	0.20	-0.13	0.81
Situated Experiences	250	.48	0.15	-0.07	0.77
Year 1 – Year 3					
Personality	200	.58	0.09	0.32	0.76
Activities	500	.39	0.16	-0.08	0.79
Situated Experiences	250	.44	0.13	0.08	0.75

Note. “*B*” = number of bootstrapped correlation coefficients within each construct type. Year 1 – Year 2 refers to the bootstrapped coefficients for the stability between Year 1 and Year 2, and Year 2 – Year 3 refers to the bootstrapped coefficients for the stability between Year 2 and Year 3. “Personality” = personality states; DIAMONDS = average of Duty, Mating, Adversity, Sociality, and Positivity vs. Negativity.

Discussion

How stable are features of our daily situations? To test this question, I analyzed an existing dataset from a longitudinal study of personality and behavior in daily life. I categorized 24 situation characteristics into three groups: situated experiences (which described how participants construed situations), activities (which described the environments and behaviors contained within situations), and a subset of coded DIAMONDS characteristics (which described the themes and content of a situation). The stability of situated experiences was quite high for our college student sample, comparable to the stability of average personality states as measured in this and previous studies (Baird et al., 2006). Activities and DIAMONDS characteristics were less stable, but stability was still moderate for most variables examined.

Although I did not have any a priori hypotheses and could not form any due to my preexisting familiarity with portions of this dataset, these results are reasonable given existing models of situations and previous estimates of week-to-week stability of situation features (Rauthmann et al., 2014; Rauthmann & Sherman, 2016b). Situated experiences are conceptually closer to personality constructs than are external features of situations. Therefore, the stability of personality traits should contribute to the stability of subjective evaluations of situations, and vice versa (Ziegler et al., 2019). Conversely, activities and characteristics like Mating are more constrained by external factors (e.g., others' availability, work demands); the association between personality and activities and some DIAMONDS characteristics is likely attenuated by these practical constraints (Wrzus et al., 2016). Additionally, some characteristics in this study were shown to have low base rates in this sample, including Deception, Adversity, Mating, and on phone/Skype. Given that rarer situation experiences may not be captured in a two-week time period, these variables will demonstrate less stability in an ESM study. Indeed, other researchers

have noted that ESM is well-suited to measuring typical situation experiences, not atypical ones (Ebner-Priemer & Trull, 2009). Intensive retrospective studies may be necessary to understand the stability and frequency of these characteristics.

On average, the DIAMONDS characteristics I could examine in this study were the least stable categories of situation experience. Sociality was very stable in these data. Because the sample of situations in the DIAMONDS data all involve social interaction of some kind, this result is somewhat surprising (due to the restriction of range) and difficult to interpret without a sample of non-social situations. Given that college students are regularly in class and studying, we should expect Duty to be relatively stable across the college experience or to slightly increase over time, corresponding with conscientiousness development across the lifespan (Donnellan & Lucas, 2008).

Adversity and Mating were the least stable DIAMONDS characteristics in these data. We observed low base rates for both variables at both assessment periods, which likely contributed to their weak stability estimates. Given that the DIAMONDS characteristics were coded by observers, a characteristic like Adversity may be harder to judge than a characteristic like Sociality, suggesting that having both independent coder ratings and self-ratings of situation variables would be valuable in future research. Additionally, Mating is a situation characteristic that is more dependent on the individual's resources and environment (e.g., access to attractive others) and subject to drastic change from year to year (e.g., the transition from being in a serious relationship to being single after a breakup). In short, several factors likely contributed to the differing levels of stability that I observed amongst the DIAMONDS characteristics.

Why might we expect individual differences in situation experiences to be stable over time? For one, we know that much of the human experience consists of routine behaviors that we

perform on a daily basis. Past research suggests that adults wake up, go to work, socialize, eat, and sleep at relatively stable times (Csikszentmihalyi et al., 1977; Guillaume et al., 2016). As discussed above, time use research and intensive measurement methods have shown that the rhythms of our lives are relatively regular. Longitudinal changes in time use have been observed — for example, lower income workers have reported increased leisure time compared to higher income workers since the 1980s (Aguiar & Hurst, 2009) — but these changes typically occur across several decades. Of course, there is variability around these trends (Larsen & Kasimatis, 1990) and individuals can choose to opt out of these rhythms (e.g., being self-employed, working overnight shifts), but on average, consistent patterns of activities and situated experiences are observed across cultures (Guillaume et al., 2016).

Excepting major life transitions (e.g., becoming a parent, starting a new job with different hours), theories of personality development suggest that our environment contributes to the stability of personality traits, and vice versa (Bleidorn et al., 2009; Roberts et al., 2008). This study used a sample of college students at a residential school, where their environment was relatively stable over three years (e.g., they didn't move, they didn't get a full-time job). Indeed, though college students show slight maturational personality change during college (Robins et al., 2001), their personality trait levels remain quite stable throughout college. These findings suggest that within a stable environment, personality traits and situation experiences show considerable stability from year to year. Similar to findings in behavioral genetics, we see that both genes (person factors) and the environment contribute to behavioral stability (Bleidorn et al., 2009). This research is an important first step in examining how personality and situation experiences influence each other over time.

Another means by which personality and situation experience interact is via person-situation transactions. Buss (1987) asserts that individuals can control the situations they experience by selecting into certain situations that reinforce their levels of certain traits (e.g., extraverted people select into more social environments). Similarly, the theories of person-environment fit (Ekehammar, 1974; Roberts & Robins, 2004) posit that individuals experience more positive affect when experiencing situations congruent with their personality traits (Suls et al., 1998). Although the evidence supporting this theory in the person-situation domain is mixed (e.g., some traits show fit effects, others show null or opposite effects), these studies do show that people select into similar situations at similar rates over time. Therefore, since people often select into situations that facilitate personality trait expression, both personality and situation experience should show significant stability.

However, there are also factors that could cause less stability in situation experiences over time. Self-selection into certain situations may be difficult for several reasons. For example, many social situations require coordination with other people (e.g., playing team sports), which can be out of the control of the individual. Likewise, some leisure activities require resources (e.g., money, means of transportation) that may not be available to the individual. Although people may perceive situations in a stable way (e.g., an individual can have a stable perception of interactions with the opposite sex as being threatening), the stability of external features of situations (e.g., the frequency of opposite sex social interactions) may be attenuated due to factors that are outside people's control.

Daily situation experiences showed a range of stability across two years but exhibited moderate stability on average. Situated experiences (e.g., how well do you know your interaction partners?) were the most stable situation experience category. Activities and the DIAMONDS

characteristics were less stable than situated experiences but exhibited moderate levels of stability. These findings suggest that it may be valid to conceptualize situation experiences as a stable individual difference. Further research in this domain with more diverse samples is necessary to test this claim, but these findings are an exploratory first step in validating situation experiences as a stable individual difference. This would suggest that the situations people experience, and how they experience them, are an enduring part of who they are. Furthermore, the situations people experience are also part of what makes them different from one another – some people consistently engage in different activities (e.g., socializing, listening to music, working) than others, and consistently experience situations differently (e.g., how much they like the people they interact with, how stressful they find their daily experiences, etc.).

These findings suggest that we can predict what situations people will experience in the future based on the situations they have experienced in the past, at least for college students. We should not assume that a tendency to be in group interactions, for example, is entirely fleeting or contingent on the immediate environment. People who spend a lot (or not a lot) of time in group interactions, are likely to continue to do so. This finding, should it hold up in future studies, will have important implications for intervention research. If situations are a source of stability in people's lives, then interventions aimed at changing behavior may also need to consider changing people's daily situations.

Future Research

Several fruitful avenues of future research follow from this work. First, I believe that a taxonomy of situation experience that integrates situation perception, activities, and interpersonal roles is critical for measurement of situations. Although using multiple frameworks and types of methods could address this point in the interim, issues of interpretation will follow these future

analyses. Although psychologists emphasize the subjective elements of situation experience, measuring more observable elements of situations is critical to translating our work and applying our findings in real world contexts.

Second, a large-scale ESM study of personality and situation experience would illuminate the extent to which aggregated personality states and situation experience correlate with each other over time. The small sample size of this study restricted my ability to construct these analyses, but a larger and more programmatic study could investigate these complex, interesting effects. Understanding how situation experiences and personality influence each other over time is a fundamental question of personality and social psychology and must be rigorously investigated.

Third, a multi-year longitudinal study with waves of intensive daily measurement using at least one situation taxonomy (and other environmental variables) is necessary to understand how situation experiences change over time. How do situation experiences shift in response to maturation effects and major life events? Although this study suggests that situation experiences stay relatively stable within one stage of life (i.e., college), understanding the degree of change that occurs in response to major life events and shifts in interpersonal roles, in addition to variability in stability across situation experience characteristics, would enrich our understanding of how a person changes over their lifetime.

Third, as discussed above, the stability of situation experiences has profound implications for intervention research. For example, a smoking cessation intervention would encourage both the reduction of the harmful behavior (i.e., smoking a cigarette) and also changing the social situations one might experience (e.g., a directive to spend more time around people you know well or to spend more time in coffee shop and less time in bars). This hypothetical intervention

could also utilize experience sampling or mobile sensing data to nudge the participants away from triggering situations and towards constructive situations. Indeed, early evidence suggests that this approach can be effective in the cigarette smoking context. Hébert and colleagues (2018) utilized a situation-focused ecological momentary assessment (EMA) intervention aimed at reducing smoking cessation with promising results, and previous research has determined that there are situational triggers for smoking behavior, including being around other smokers, being at another person's home, and drinking around others (Thrul et al., 2014). However, this study was conducted with a small sample size and no control group. A larger scale version of Hébert and colleagues (2018) study, including a control group and a group completing EMA surveys and receiving messages in response to commonly triggering situations, could demonstrate the value of situation-focused interventions. Further, additional research in this domain has shown that there are individual differences in which situations trigger smoking behavior based on factors such as sexual orientation and race (Cerrada et al., 2016; Nguyen et al., 2018). Including a third group in this hypothetical study with EMA messaging tailored to their most potent situational triggers could elucidate how individual differences in situational associations impact the effectiveness of such interventions. In sum, these findings suggest that ecological momentary interventions can be effective in producing long-term behavior change, since situation experiences show moderate to high levels of stability year over year.

Limitations

There are several limitations to this study that should be noted outright. First, the sample of participants who completed ESM assessments at all three time points is far smaller than ideal and inhibits my power to detect small effects. Therefore, I cannot perform correlated change models or other more nuanced, complex developmental models with the current data. This is

unfortunate, as correlated change between personality states and situation experiences are of great interest to social and personality psychologists. Future longitudinal studies of daily life will hopefully address this question soon.

Second, this sample is composed entirely of students at a large private American university, the majority of whom were first-year students at the first wave of assessment; as such, I am not confident that the results of this study would generalize beyond college student populations in similar cultures. It is not clear whether stability would be higher or lower in non-student samples. On one hand, none of the students in this sample graduated college, moved, or changed vocations during the study period, which suggests their lives may have been more stable than the typical adult. On the other hand, the stability estimates in this sample could be attenuated by the homogeneity in the participants' routines (because they are all students at the same university), and a more diverse sample with greater between-person differences in situations may show more stable individual differences. Future research should examine diverse samples and examine stability during life transitions.

Third, these measures of situation experiences have limitations. The study that generated this data was designed to test several different research questions (the present research questions not included), and the measures of situation experience were largely inspired by researchers' intuitions about what situations are regularly experienced by most college students. Despite these intentions, these measures are not comprehensive. However, given the lack longitudinal studies of personality and situations in daily life, this study is a critical first investigation into this important question.

Fourth, due to discrepancies in coding processes for the DIAMONDS characteristics, I could not analyze all eight characteristics. Given the current sample, it is unlikely that I have the

power to detect stability for the rarer situation characteristics (i.e., Adversity, Deception, Mating). Moreover, the discrepancy between the Year 1 coders' and the Year 2 coders' interpretations of "Intellect" is a clear limitation of this study, given that Intellect is a highly relevant characteristic for this college student sample. Given that college students' dutiful work often comes from the educational sphere, more research differentiating Intellect and Duty from each other can clarify this distinction for future researchers. Additionally, future research into daily situations should employ more comprehensive coding procedures and include the DIAMONDS characteristics in self-report surveys.

Finally, as discussed above, researchers may disagree about how to conceptualize situations, and an argument could be made that the measures in this study captured activities or even behaviors rather than characteristics of situation experience. While I am sympathetic to this argument, my review of the literature on this topic makes me skeptical of the existence of any set of situation measures that capture psychologically-relevant features of situations and do not have this interpretational ambiguity. For example, being around others is simultaneously a feature of the environment/situation and a behavior/activity chosen by the participant. I contend that, on the continuum from pure measures of personality to pure measures of situations, the present variables are on the latter side of the continuum, and far enough away from pure personality measures to provide new insights.

Conclusion

Across two years, I found that daily situation experiences were relatively stable. Although I circumscribe these conclusions to college students in the United States, these are the first data to test whether situation experiences are a stable individual difference. The extent to which we find ourselves in work, social, or leisure situations more or less than our peers seems

to be relatively consistent over time. This suggests that stable situations may be a source of stability in people's personality and behavior, and vice versa. Moreover, any attempts at intervening in people's lives and changing their patterns of behavior may require changing the types of situations they experience.

Appendix A

Experience Sampling Survey

Note: For the following questions, please refer to the situation in which you spent the most time.

From 11am-noon (2pm–3pm, 5pm–6pm, 8pm–9pm), were you interacting with other people?
(no, 1 person, 2 people, 3–5 people, 5+ people)

The following was an open response question answered using a text box.

In a few words, what were you doing during the last hour?

The following questions were answered using a Likert-type scale from 1 (*Not at all*) to 5 (*Very much*) except where noted.

How stressful was the situation?

How common/familiar was the situation?

In this situation, were you free to behave however you wanted?

Please refer to the people you interacted with from 11am-noon (2pm–3pm, 5pm–6pm, 8pm–9pm) for the following questions:

How well do you know them?

How much do you like them?

Compared to them, how much power/social status do you have? (1 [*Less than them*] to 5 [*More than them*])

The following questions were checklist items.

From 11am-noon (2pm–3pm, 5pm–6pm, 8pm–9pm), check the items that occurred.

Stayed mostly in your room/house

Studied/worked

Listened to music

In pain/sick

Talked on the phone/Skype

Watched a video/tv/movie

Went to class

From 11am-noon (2pm–3pm, 5pm–6pm, 8pm–9pm), check the items that occurred.

Interacted with local best friend

Interacted with another close friend

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