Published in final edited form as:

Eur J Pers. 2019 ; 33(3): 279–297. doi:10.1002/per.2203.

Age Differences Across Adulthood in Interpretations of Situations and Situation-Behaviour Contingencies for Big Five States

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Abstract

In the last two decades, a burgeoning literature has begun to clarify the processes underlying personality traits and momentary trait-relevant behavior. However, such work has almost exclusively investigated these questions in young adults. During the same period, much has been learned about adult personality trait development but with scant attention to the momentary processes that contribute to development. The current work connects these two topics, testing developmental questions about adult age differences and thus examining how age matters to personality processes. The study examines how four important situation characteristics are experienced in everyday life and how situations covary with Big Five trait-relevant behavior (i.e., situation-behavior contingencies). Two samples were collected (total N=316), each assessing three age groups: young, middle-aged, and older adults. Using ESM, participants completed reports 4 or 5 times per day across a representative period of daily life. Results suggested age differences in how situations are experienced on average, in the variability around these average situation experiences, and in situation-behavior contingencies. The results therefore highlight that, across adulthood, age groups experience chronically different situations, differ in how much the situations they experience vary moment to moment, and differ in how much situation experience predicts their enactment of traits.

Keywords

situations; personality processes; Big Five personality traits; experience sampling; personality development

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Introduction

The purpose of this article is to gain a better understanding of developmental aspects of situation experience and how it covaries with Big Five trait-relevant behavior within three periods of the adult lifespan: young adulthood, middle age, and retirement after age 60. We conducted two studies to assess individuals' momentary interpretations of situations in the context of their Big Five behavior within representative periods of their daily lives. Three questions are posed: 1) How do young, middle-aged, and older adults differ in their average interpretations of situations?; 2) How do young, middle-aged, and older adults differ in how much their interpretations of situations vary (i.e., age differences in intraindividual variability of situation experience)?; and 3) How does situational variability explain differences in Big Five behavior variability—and do these situation-behavior contingencies differ by age group?

Examining age differences in individuals' interpretations of situations and the extent to which they predict behavior is important for at least four reasons. First, it not only explores whether *interpretations of situations*, or how people experience the psychologically active aspects of situations, differs with age, but also investigates whether situation interpretation is a developmental phenomenon and follows patterns that may be predicted from developmental theories (Fleeson & Jolley, 2006). Second, it extends a small body of previous work on *situation-behavior contingencies*, or how interpretations of situations covary with and help to explain Big Five trait-relevant behavior (e.g., Church et al., 2013; Fleeson, 2007; Minbashian, Wood, & Beckmann, 2010; Sherman, Rauthmann, Brown, Serfass, & Jones, 2015). In particular, it examines whether such contingencies replicate in middle-aged and older adult samples, age groups who have seldom been studied in previous work. Third, although considerable research has examined within-person variability in trait-relevant behavior (Nofle & Fleeson, 2015), little work has examined variability in explanatory psychological variables, such as interpretations of situations, which could influence trait-relevant behavior and aid in explaining behavioral variability. This is crucial research to perform to generate a more comprehensive understanding of both descriptive and explanatory aspects of traits as according to Whole Trait Theory (Fleeson & Jayawickreme, 2015) and other theories that seek to integrate trait and process approaches to personality (e.g., Baumert et al., 2017; Wood, Gardner, & Harms, 2015; Wrzus & Roberts, 2017). Fourth, it places the study of personality development in context; it moves past first-generation questions of how traits vary with age to second-generation questions of how other personality processes that may contribute to traits vary with age (Nofle & Fleeson, 2015; Wood & Denissen, 2015).

Personality Processes and Personality Development

The last twenty years have yielded two important literatures in personality relevant to these second-generation questions: one investigating personality processes underlying traits (Fleeson, 2017) and another tracking trait development (Specht et al., 2014). First, a surge of new work on personality processes has integrated social cognitive and trait approaches (Vazire & Sherman, 2017). The idea is that personality traits can be studied both at the dispositional and state levels by using trait terms to capture short term, momentarily enacted

“personality states” or “trait-relevant behavior” (Fleeson, 2001). By assessing multiple instances of personality states, a density distribution can be formed that captures both an average level (i.e., a person’s central behavioral tendency) and variability around that average. A host of evidence suggests that most people display a large amount of variability in their trait-relevant behavior (Fleeson & Law, 2015). Current research focuses on social cognitive variables, such as situation experience, as a way to explain this intraindividual behavior variability (Fleeson & Jayawickreme, 2015).

Second, a large literature has examined change in personality traits over time, charting the normative ways in which traits change (Specht et al., 2014). This work has identified predictable trajectories that capture how traits change across the lifespan for most people. For example, one of the most robustly supported conclusions is the Maturity Principle (Roberts & Wood, 2006), which describes the tendency for the Big Five traits of Agreeableness, Conscientiousness, and Emotional Stability to increase gradually across most of the adult lifespan (Roberts, Walton, & Viechtbauer, 2006). Evidence also suggests that the trait of Openness to Experience, as well as Social Vitality (one of the two major aspects of Extraversion), both tend to decrease slightly across adulthood. However, Social Dominance, the other aspect of Extraversion, tends to follow an upward trajectory until at least middle age and thus also conforms to the Maturity Principle. Researchers have sought to explain *why* traits tend to change in these ways, although more is still known about the descriptive patterns of change than the mechanisms producing change (Hampson, 2012). Fortunately, theory has begun to synthesize the personality trait development literature with the personality processes literature (Baumert et al., 2017; Nofle & Fleeson, 2015; Wood & Denissen, 2015; Wrzus & Roberts, 2017).

The current work builds on previous research, which utilized three ESM studies to examine age differences in Big Five behavior averages and variabilities across the adult lifespan (Nofle & Fleeson, 2010). In the first two studies, which were conducted within everyday life, we found that age groups differed on behavior variabilities for four of the Big Five traits. Interestingly, differences in typical situations experienced by individuals of different ages seemed to be the driving force behind these differences in variability. When the three age groups were brought into the lab to participate in the third study, which employed a set of standardized situations, the age-related differences in behavior variability nearly disappeared. In addition, the patterns of age differences in trait-relevant behavior averages were different between the standardized situations and everyday life. These two findings therefore suggest that the three age groups often experience different types of situations in everyday life, which may partly drive age differences in behavior averages and variability. Therefore, the current work examines how interpretations of situations, an important social-cognitive variable, contribute specifically to personality processes and more broadly to lifespan personality development.

Theory and Research on Situation Experience across the Adult Lifespan

In a recent target article, Rauthmann, Sherman, and Funder (2015) provided an integrative history of situation research and offered a thoughtful set of principles to guide future research efforts. In particular, they called for work on what they term *situation*

characteristics, which capture the psychological meaning of situations (Fleeson, 2007; Rauthmann et al., 2014) instead of simply tracking one's physical surroundings. We investigated four situation characteristics in the current study: the interestingness of the situation, the friendliness of others, how much decision-making was involved, and how much a person perceived they were being evaluated. We provide further details later.

One issue in studying situations is the relative level of subjectivity that may necessarily be involved. Whereas Rauthmann et al. (2015) argue that the assessment of situations must not inadvertently simply represent another person variable, but instead should at least partly rely on others' perspectives of the situation, we believe that this is not essential or even desirable for all research on situations (Nofle & Gust, 2015). Our work thus draws on the target's own interpretation of his or her current situation, or what we more simply term as *situation experience*. However, it is worth noting that because we only use self-reports of situations, we are unable to cleanly differentiate between the actual objective occurrence of different situations across age groups versus a tendency for various age groups to construe their situations differently.

Similar to the density distributions approach for personality traits, situations may also be studied on at least two levels: at a trait level and at a state level (e.g., Sherman et al., 2015). At the trait level, average situation experience represents a person's typical psycho-ecology—what their psychological environment is like on average. At the state level, situation experience is parallel to trait-relevant behavior—these perceptions vary from moment to moment. Therefore, a data collection approach that permits multiple situation assessments in everyday life, such as the Experience Sampling Method (ESM), allows at least two parameters to be distinguished: a central tendency of average situation experiences, as well as variability around that central tendency. These two parameters of situation experience are theorized to demonstrate age differences. First, average situation experience may vary across different spans of adulthood (e.g., younger people's perceptions of their typical situations may be quite different from older people's perceptions, as well as the possibility that people of different ages may find themselves in objectively different situations). Second, there also may be age differences in situation variability (e.g., young people's perceptions for some situational factors may be more variable within daily life than older people's perceptions or situations themselves may be more variable within different age spans). One integrative developmental personality theory, the GLIDE-STRIDE meta-theory (Fleeson & Jolley, 2006; Nofle & Fleeson, 2015), is particularly helpful in predicting these age differences (see also complementary approaches by Dweck, 2017; Wood & Denissen, 2015; Wrzus & Roberts, 2017). This theory, which is a developmental instantiation of Whole Trait Theory (Fleeson & Jayawickreme, 2015), argues for two sets of explanatory mechanisms which guide adult personality development. The first set of macro, distal "GLIDE" mechanisms includes forces that operate over the long term to produce stability or gradual change in personality traits: Genetics, Learning, Identity, Developmental regulation and the Environment. These GLIDE mechanisms do not directly affect behavior, but instead have an indirect influence through their impact on the strength or variability of the proximal "STRIDE" mechanisms, which operate over the short term to produce stability or variability in trait-relevant behavior: Stabilizing forces, Temporal trends, Resource availability, Interpretations of situations (what we generally term here as situation experience), Drives

and desires, and Error. Below we also discuss more specific developmental theories which illustrate particularly relevant mechanisms.

Two GLIDE mechanisms appear to be important for predicting age differences in the positivity of average situation experience: Learning and Developmental regulation. Learning involves a variety of habits, skills, and capabilities that develop as people age and suggests that people will respond to situations in increasingly skilled ways as they move towards older adulthood. As such, we might expect older people to interpret their situations more positively than younger people. Developmental regulation (Heckhausen, 2002) refers to a lifelong need to have agency in one's ongoing development. Heckhausen's theory argues for an increase across the lifespan in secondary control striving, which involves changing the self to fit one's environment; older adults have been found to be more likely to disengage with goals that end up being unattainable, and also are more likely to reinterpret ambiguous outcomes in a positive light, all for self-protective purposes (Heckhausen, Wrosch, & Schulz, 2010). Another related age-graded phenomenon is termed selectivity and describes a tendency for people to be agentially and increasingly selective about the goals they pursue, especially as they get older, partly because of increased constraints on their physical, cognitive, and environmental resources (Heckhausen et al., 2010). Socioemotional selectivity theory (SST; Carstensen & Mikels, 2005) focuses on a tendency for people to shift goal pursuit to more emotionally meaningful goals as they get older and typically have more narrowed time perspectives. SST suggests that, as they age and develop better self-regulation, people will select situations that better fit their goals and personalities than they did earlier in their lives, and furthermore suggests that older people may interpret their situations more positively, especially when positive elements of situations (vs. negative) are investigated. Hence, both increased secondary control and SST predict that older people would show higher average levels of friendliness and interestingness (as positive aspects of situations) than younger people and that this discrepancy may be greater than for other situation characteristics, such as the more negative characteristic of evaluation.

Despite these new theories, there is a paucity of research on age differences in situations. Apparently only two extant studies have examined age differences in situation experience averages across the adult lifespan, and neither directly assessed situation characteristics but instead measured daily activities (Brown & Rauthmann, 2016; Wrzus, Wagner, & Riediger, 2016). In the first study, Wrzus et al. (2016) conducted an ESM study in a sample extending along most of the adult lifespan and asked about two types of situation cues: the people present (e.g., friends, family, colleagues) and the activity involved in (e.g., work, leisure, chores). In the second study, Brown and Rauthmann (2016) conducted an examination of daily activities gleaned through the day reconstruction method in two large, nationally representative samples of U.S. and German residents. Through a coding process, they were able to connect and recode activities into the eight situation characteristics subsumed in DIAMONDS, a taxonomy which attempts to identify the most common and important situational characteristics that predict behavior (Rauthmann et al., 2014). We return to the specifics of these studies to formulate our hypotheses for the presently studied situation characteristics.

As far as we know, no studies have examined age differences in situation variability or situation-behavior contingencies; we therefore rely solely on theory to make age differences predictions for our second and third questions. Three GLIDE mechanisms may be particularly important for their impact on variability in situation experience: the Environment, Learning, and Developmental regulation. Environment is a broad domain that includes social roles, physical locales, social settings, and culture. It is likely that as young adults enter into middle age, environments transition from being highly variable to much more stable and predictable (Wzrus & Roberts, 2017), in part due to increasingly stable social roles typically adopted by people in middle age. Environments are also much more likely to be constrained in older adulthood (but perhaps not quite as much as in middle age) due to physical and cognitive declines. Therefore, because environments are more stable in middle age and older adulthood than young adulthood, situation experiences likely become more narrowed and regular over time. On the one hand, and in addition to producing more positively experienced situations, Learning may also produce less variability in situation experience in older age because people develop habits that facilitate increasingly routinized (and thus less variable) interpretations of their immediate situations. On the other hand, an aspect of Learning associated with skills and wisdom might even predict increased variability as people age due to increasing nuance and discernment in how situations are interpreted. Alternatively, Developmental regulation suggests a third age pattern—the likely maintenance of relatively high levels of variability in situation experiences across the lifespan because of people’s continuing flexibility in selecting situations, although possibly slightly lower variability in older ages because of the increasing tendency to select situations that better fit one’s personality. Thus, GLIDE-STRIDE theory makes somewhat different predictions for age differences in variability based on which developmental mechanism is considered.

In addition to examining average situation experiences and the variability around such averages, our third question concerns age differences in situation-behavior contingencies. As previously mentioned, a growing literature has examined situational influences on trait-relevant behavior (Bleidorn, 2009; Church et al., 2008; Côté, Moskowitz, & Zuroff, 2012; Fleeson, 2007; Fournier, Moskowitz, & Zuroff, 2009; Huang & Ryan, 2011; Judge, Simon, Hurst, & Kelley, 2013; Minbashian, Wood, & Beckmann, 2010; Sherman, Rauthmann, Brown, Serfass, & Jones, 2015). Although most of this literature has exclusively examined situation-behavior contingencies within samples of young adults, we also expect there to be somewhat similar associations for middle-aged and older adults. However, some theory suggests that there would be age differences in the strength of these associations. GLIDE mechanisms of Learning and Developmental regulation suggest that with aging comes a better grasp of which trait-relevant behavior is appropriate to a given situation. Therefore, we might expect older people to have generally stronger contingencies than younger people.

Current Approach and Hypotheses

The current work examines situation experiences and situation-behavior contingencies in adult age groups across four situation categories: 1) the interestingness of a situation, 2) the friendliness of others present, 3) the amount of decision-making that a situation requires, and 4) how much a given individual feels they are being evaluated. Although the study was

conducted before the DIAMONDS situation taxonomy was developed (Rauthmann et al., 2014), the four categories correspond at least somewhat to six of the eight DIAMONDS dimensions: interestingness with Intellect (cognitively orienting), friendliness to both Positivity (likely to be enjoyable) and Sociality (potential for engagement and social reward), decision-making to Duty (not only subsuming task orientation but also rational thinking, both central to decision-making), and evaluation to Negativity (likely stress-inducing) and potentially aspects of Adversity (possibility of criticism). In Table S1, we demonstrate how item content connects across the two sets of measures. However, it should be noted that the four characteristics do not represent a comprehensive set of situation characteristics; for example they have little to do with the DIAMONDS categories of Mating or Deception, as well as other situational categories not covered by DIAMONDS such as aesthetic experience and helping/caregiving (Nofle & Gust, 2015). They also largely lie apart from situation categories related to basic human motives (Morse, Neel, Todd, & Funder, 2014) such as disease avoidance and status-seeking. Hence, together the four categories are not an exhaustive survey of situational content but still represent reasonable coverage of some important aspects of situations, and also include positive (friendliness and interestingness), mixed (decision-making), and negative (evaluation) situation characteristics.

The four situation characteristics were also chosen because they should be relevant for adults of all ages and also germane to Big Five trait-relevant behavior. A small literature suggests that trait-relevant behaviors might be most strongly contingent on certain situation characteristics (summarized in Table 1). Brown and Rauthmann (2016) synthesize previous research on how DIAMONDS map onto the Big Five; as such, to the extent that our four situation characteristics map onto DIAMONDS, we can make similar predictions. First, interestingness, relevant to the DIAMONDS characteristic of intellect, should be most strongly related to open behavior, in part because Openness is linked to the reward system when cognitive activity is engaged (Denissen & Penke, 2008). Because it also contains an approach tendency, interestingness is also theoretically relevant to extraverted behavior, due to Extraversion's association with reward sensitivity (Lucas, Diener, Grob, Suh, & Shao, 2000), especially in social situations (Denissen & Penke, 2008). Second, friendliness, relevant to the DIAMONDS characteristics of sociality and positivity, should be most strongly associated with extraverted, agreeable, and emotionally stable behavior. Previous work by Fleeson (2007) and Huang and Ryan (2011) also found that both extraverted and agreeable behavior were partly contingent on friendliness. Third, decision-making, relevant to the DIAMONDS characteristic of duty, and to the similar situation characteristic of task orientation (Fleeson, 2007), should be most strongly associated with conscientious behavior. Fourth, evaluation, relevant to the DIAMONDS characteristic of negativity, should be most strongly (negatively) associated with emotionally stable and extraverted behavior, in particular the former because Emotional Stability reflects the functioning of the punishment system when a person faces cues of social exclusion (Denissen & Penke, 2008). As Minbashian, Wood, and Beckmann (2010) found conscientious behavior to be contingent on task demand, a characteristic similar to evaluation, we expect evaluation to be related to conscientious behavior.

We now turn to specified hypotheses for our three research questions on age differences in average situation experience, variability in situation experience, and situation-behavior contingencies. Most of these hypotheses are at least somewhat exploratory because, as previously mentioned, there is a paucity of literature on these questions. These hypotheses were not pre-registered.

Average situation experience—GLIDE-STRIDE theory predicts that average situation experience should generally become more positive across the adult lifespan (e.g., because of selectivity), with the caveat that retirement could show mixed results due to variance in healthy aging and constraints in living situations. At a more specific level for each of the categories, the limited previous research suggests a somewhat different pattern than the general predictions from GLIDE-STRIDE theory. Table 1 provides a summary of predictions from two main sources. First, we extracted *activity-based* predictions in accordance with previously mentioned studies of daily activities by Brown and Rauthmann (2016) and Wrzus et al. (2016), which we extrapolated to our situation categories. Second, in line with Brown and Rauthmann's *trait-based* approach, we deduced how patterns of trait change across the lifespan could apply to situation experiences that people of different ages might have, given that trait and situation characteristics are somewhat "contentwise commensurate" (p. 668).

In considering these two sources, activity-based predictions suggest that the interestingness of a given situation would peak in middle age, as Brown and Rauthmann (2016) found intellect-related daily activities were highest during that period. In contrast, the trait-based approach suggests a decline across the adult lifespan due to decreases in Openness. Further, activity-based predictions suggest that friendliness of others in a given situation might decrease across adulthood, due to Brown and Rauthmann's finding that older adults engage in fewer activities related to sociality than young and middle-aged adults. However, Brown and Rauthmann also found that positivity-related activities were lowest in middle-aged adults, and Wrzus et al. found that they spent the least time with friends and family; together, these results suggest that friendliness might be lowest among middle-aged adults. Trait-based predictions are also mixed: lifespan increases in Agreeableness and Emotional Stability suggest an increase in friendliness, but lifespan decreases in the Social Vitality aspect of Extraversion suggest a decrease. We expect decision-making to peak in middle age because Brown and Rauthmann (2016) found that duty-related activities were highest in middle-aged people and Wrzus et al. (2016) found them to spend the least time at leisure. We also might expect decision-making to be lowest in older adults because Wrzus et al. found that young and middle-aged adults were more often at school or work. Trait-based predictions suggest a lifespan increase in decision-making because Conscientiousness tends to increase across adulthood. Finally, evaluation could be highest in middle age because negativity-related daily activities tend to peak then (Brown & Rauthmann, 2016), but evaluation could also be lowest in older adults because young and middle-aged adults spend more time at school and/or work (Wrzus et al., 2016). Trait-based predictions suggest that evaluation would be lowest in older adulthood because of lifespan increases in Emotional Stability, Conscientiousness, and the Social Dominance aspect of Extraversion. As Table 1 summarizes, the small literature provides mixed predictions for age differences in average

situation experiences. Therefore, we offer the following hypotheses, which are based on consistent patterns gleaned from activity- and trait-based approaches: lower levels of both interestingness and evaluation for older adults than for middle-aged adults, and the highest levels of decision-making in middle-aged adults. Due to the extraordinarily heterogeneous patterns, we do not offer hypotheses for the situational characteristic of friendliness.

Variability in situation experience—The Developmental regulation mechanism of GLIDE-STRIDE theory suggests that variability in situation experience should remain relatively high across the lifespan. Alternatively, the mechanisms of Learning and the Environment suggest somewhat decreasing variability in middle age into retirement as people more carefully choose which environments best fit who they are. To the extent that variability in situation experience is parallel to variability in trait-relevant behavior, we also might expect less variability in older adults because they tend to be less variable in trait-relevant behavior, although not for all trait domains (Nofle & Fleeson, 2010). Unfortunately, there is no empirical literature that allows for the formation of predictions about how age groups might differ in situation variability for specific situation categories, and thus Table 1 does not include predictions for age differences in situation variability.

Situation-behavior contingencies—GLIDE-STRIDE theory argues that situation-behavior contingencies should remain similar in magnitude across the lifespan. If there are age trends, we might expect contingencies to become stronger with age because of improvements in matching one's behavior to situations due to the mechanism of Learning. However, if situation experience both becomes more positive and less variable as the lifespan progresses, there may be less predictability due to restriction of range, and thus weaker situation-behavior contingencies. Because the general age differences predictions are uncertain, we do not make targeted predictions for how specific situation-behavior contingencies might differ across age periods.

Method

Recruitment

Two samples of participants were recruited as part of the Integrating Process and Structure in Personality project (Nofle & Fleeson, 2010), a large-scale behavioral study conducted at Wake Forest University. Three age groups were investigated: young, middle-aged, and older adults. Young adults were recruited from posters displayed around campus, whereas middle-aged and older adults were recruited from local media advertisements. Because young adults were recruited from posters displayed on campus, middle-aged and older adults were required to have “some college” (Sample 1) or a college degree (Sample 2) to create groups with similar educational backgrounds. Some of these data have previously been published in Nofle and Fleeson (2010), which investigated age differences in Big Five behavior averages and variability but did not include analyses of situation experiences or situation-behavior contingencies.

Participants

Sample 1 comprised 80 participants, including 26 young adults (18–22 years old; $M = 19.46$, $SD = 1.42$), 26 middle-aged adults (36–54 years old; $M = 44.58$, $SD = 5.22$), and 25 older adults (66–81 years old; $M = 70.88$, $SD = 3.78$); age was unavailable for three participants who were retained for analyses that did not involve age differences. Across the three age groups, 54%–64% were women. The sample was 70% Caucasian, 21% African American, and 4% Asian (5% of the sample did not report race). Young adults were paid \$40 each for participating, and middle-aged and older adults were paid \$75 each. Sample 2 comprised 236 participants, including 112 young adults (18–23 years old; $M = 19.62$, $SD = 1.31$), 59 middle-aged adults (36–55 years old; $M = 46.95$, $SD = 5.48$), and 65 older adults (65–80 years old; $M = 71.68$, $SD = 4.20$). Across the three age groups, 52%–74% were women. The sample was 79% Caucasian, 16% African American, 2% Asian, and 1% Pacific Islander (1% of the sample either reported more than one race or did not report race). All participants in Sample 2 were reimbursed \$25 for completing the study. In both samples, retired adults were targeted and recruited for the older adult age groups; occupational status was not available for the other age groups. The data were collected in 2006–2008, and sample size was determined based on what was considered adequate for experience-sampling method (ESM) studies at that time. However, Sample 2 clearly has higher statistical power for testing the current questions.

Procedure

Participants were asked to complete short ESM questionnaires designed to collect multiple representative reports of their momentary situations and Big Five trait-relevant behavior (see questionnaires here: <https://osf.io/g8vtm/>). Participants in Sample 1 were asked to complete these surveys five times per day for two weeks, whereas participants in Sample 2 were asked to complete them four times per day for one week. Depending on their normal daily schedule, participants in Sample 1 were able to choose either a 9 a.m. to 9 p.m. schedule or a 12 p.m. to 12 a.m. schedule. Middle-aged and older adults were more likely to choose the 9 a.m. to 9 p.m. schedule ($N = 21$ in both cases) than young adults ($N = 11$). Participants in Sample 2 were required to complete reports at the following times: 12 p.m., 3 p.m., 6 p.m., and 9 p.m.

All surveys were completed on Palm Pilots. At each report time, questions were displayed one at a time on the screen, and participants responded by tapping the most appropriate number with a stylus. Surveys asked participants to report on the previous 12 minutes to facilitate precise and easy recall of experiences. All reports were completed at locations outside of the lab, except for the first report, which was administered during the 45-minute training session. During the training, participants were told to skip a report if it was a major inconvenience; they were also told that it was acceptable to complete a report up to an hour after the scheduled time. The Palm Pilots verified the time that each report was completed. The importance of honest and timely reports was emphasized to all participants. In addition, participants completed a large variety of surveys, both before and after the experience-sampling portion of the study, which were not used in the current paper; however, in accordance with the transparency statement regarding open materials, we provide

information about other measures that were included in the ESM segment of the study below.

The response rate for both samples was acceptable. The mean number of reports for Sample 1 was 49.7 out of 70 planned reports (71%), ranging from 15–70 reports. Reports were excluded if they were completed either before or more than an hour after the scheduled time or if they contained more than six missing values. Overall, 516 out of 4,489 reports (11.5%) from Sample 1 were excluded. On average, young adults completed 35.31 reports, middle-aged adults completed 56.04 reports, and older adults completed 61.36 reports. Young adults provided significantly fewer valid reports than both middle-aged and older adults (between young and middle-aged adults $t = -5.66$, $p < .001$, Cohen's $d = 1.57$; between young and older adults $t = -7.22$, $p < .001$, Cohen's $d = 2.03$; between middle-aged and older adults $t = -1.83$, $p = .078$, Cohen's $d = .51$). Whereas young adults completed substantially fewer reports on average than the other two age groups, 35.31 reports is still a stable, reasonably representative number of reports to conduct analyses on, and multilevel models are well-suited to deal with uneven numbers of cases across participants.

The mean number of reports for Sample 2 was 23.4 out of 28 planned reports (83.6%), ranging from 10–37 reports (a few participants did not stop after one week). Reports were excluded if they were completed either more than 20 minutes before or more than two hours after the scheduled completion time or if they contained more than five missing values (fewer total items were given to participants in Sample 2). Overall, 780 out of 6,299 reports (12.4%) were excluded. On average, young adults completed 21.44 reports, middle-aged adults completed 25.08 reports, and older adults completed 25.20 reports. Young adults provided significantly fewer valid reports than both middle-aged and older adults (between young and middle-aged adults $t = -4.67$, $p < .001$, Cohen's $d = .76$; between young and older adults $t = -4.66$, $p < .001$, Cohen's $d = .71$; between middle-aged and older adults $t = -0.13$, $p = .90$, Cohen's $d = .02$).

Situation characteristics

Four psychologically active characteristics of situations were assessed: interestingness, friendliness of others, decision-making, and evaluation (e.g., “How friendly were other people being in the last 12 minutes?”). These questions were assessed on a 6-point Likert scale, ranging from 1 = “not at all” to 6 = “very”. In Sample 1, participants also had a “not applicable” option; in Sample 2, this option was omitted. Each of the four situational aspects were assessed with two items in Sample 1 and a single item in Sample 2. For interestingness, participants were asked “How interesting was the situation” and in Sample 1 only also “How boring was the situation” (R ; $r = -.43$). For friendliness, participants were asked “How friendly were other people being” (Sample 1) or “How friendly were others” (in Sample 2) and in Sample 1 only also “How unfriendly were other people being” (R ; $r = -.43$). For decision-making, participants were asked “How much did the situation involve decision-making by you” and in Sample 1 only also “How much were you required to make choices between options” ($r = .79$). Finally, for evaluation, participants were asked “How much will you be (or were you being) evaluated on what you were doing” and in Sample 1 only also “How much are people evaluating what you were doing” ($r = .82$). In each sample, other

characteristics of situations were assessed (familiarity of others, appropriateness of behavior, playfulness, interpersonal conflict); however, we only analyzed data from the above four situational characteristics, as these appeared in both datasets. In addition, different items were collected in each sample about emotional, motivational, and cognitive states (positive affect, negative affect, authenticity, purpose, acting similar to others, trying to please someone, avoiding rejection, and symptoms of histrionic and borderline personality disorders). Finally, a question about an objective feature of the situation (how many other people were present) was assessed in both samples but was not employed in the current study.

To be sure that each of the four situational characteristics was measuring distinct components of situations, correlations were conducted between the scales both at the unaggregated report level (see the bottom portion of Tables 2 and 3 for means, standard deviations and correlations between all unaggregated variables) and the aggregated person level (the top portion of Tables 2 and 3 contain the same information for the aggregated variables plus correlations between all variables with age). Correlations at the report level had *N*s that were above 3,000 and therefore all correlations were statistically significant. For Sample 1, interestingness was modestly correlated with friendliness, decision-making, and evaluation ($r = .24, .14$, and $.10$, respectively); friendliness was weakly correlated with decision-making and evaluation ($r = -.09$ and $-.13$, respectively); and decision-making and evaluation were strongly correlated ($r = .53$), but not highly enough to make the two characteristics redundant. For Sample 2, interestingness was moderately correlated with friendliness and modestly correlated with decision-making and evaluation ($r = .42, .25$, and $.22$, respectively); friendliness was modestly correlated with decision-making and evaluation (both r s = $.17$); and decision-making and evaluation were moderately correlated ($r = .30$). The pattern of correlations was similar at the person level, although the correlations were markedly stronger between friendliness and interestingness ($r = .43$) and between decision-making and evaluation ($r = .70$) in Sample 1 and between decision-making and interestingness ($r = .46$) in Sample 2.

Big Five personality states

The Big Five were assessed similarly to standard personality questionnaires, but instead of assessing a given participant's overall personality, the reports were designed to measure the participant's behavior in the past 12 minutes (e.g., "How assertive were you being in the previous 12 minutes?"). Similar to the situation characteristics, these questions were also assessed on a 6-point Likert scale ranging from 1 = "not at all" to 6 = "very," with the same "not applicable" option only for Sample 1. The specific adjectives chosen for this study were drawn from a set of Big Five adjectives in Goldberg (1992), were easy to understand and related to behavior, were distinct from one another, and were reliable in previous studies. Since participants were completing a large number of reports, only three of the Big-Five traits were included for each sample. Sample 1 completed reports assessing Extraversion, Agreeableness, and Emotional Stability, and each trait was measured with six items: Extraversion: "assertive," "energetic," "talkative," "quiet" (reverse-coded, henceforth designated as "R"), "unenergetic" (R), "unassertive" (R; $\alpha = .81$); Agreeableness: "respectful," "cooperative," "kind," "unkind" (R), "uncooperative" (R), "disrespectful" (R;

alpha = .75); Emotional Stability: “even-tempered,” “relaxed,” “secure,” “insecure” (R), “irritable” (R), “restless” (R; alpha = .81). Sample 2 completed reports assessing Extraversion, Conscientiousness, and Openness, and each trait was measured with three items: Extraversion: “assertive,” “energetic,” “talkative” (alpha = .75); Conscientiousness: “thorough,” “efficient,” “systematic” (alpha = .88); Openness: “creative,” “perceptive,” “imaginative,” (alpha = .79).

Results

Density distributions for situation experiences

Due to the fact that the current data are not our data, but were collected by William Fleeson, these data are not openly accessible but may be requested from him (fleesoww@wfu.edu). We provide openly accessible data analysis scripts that allow for reproduction of all reported results (link: <https://osf.io/g8vtm/>). To begin our analyses of situation experiences, we analyzed density distributions (Fleeson, 2001) using unconditional models from multilevel modeling (MLM). State situation experience (for each situation characteristic) was predicted from a grand mean, a deviation for the participant’s mean, and a deviation specific to that occasion. MLM allows for the partitioning of the total variance in behavior into two components: that which is explainable by individual differences (between-persons variance) and that which is explainable by factors present in the moment (within-person variance). We report the full results of these analyses in the Supplementary Materials. Briefly, we found substantial proportions of both between- and within-person variance, but the latter accounted for a greater proportion of the total variance in situation experience. We also found that both average situation experience and variability in situation experience were fairly stable from one week to the next. These findings suggest that both situation averages and variabilities are not fleeting and random but actually tend to be relatively stable characteristics, leaving open the possibility that age might have an influence on these processes.

Average situation experience

Using the same type of MLMs as above, we next added age group as a fixed effect to examine age differences in how situations were generally experienced by individuals of different ages. As depicted in the top half of Table 4, age group was a statistically significant predictor for two of the four situation characteristics in Sample 1 (i.e., interestingness and evaluation). Age group accounted for 27% of the between-persons variance in interestingness, 1% in friendliness, 2% in decision-making, and 4% in evaluation. In Sample 2, age group was a statistically significant predictor for three of the four situation characteristics (i.e., interestingness, decision-making, and evaluation). Age group accounted for 5% of the between-persons variance in interestingness, 0% in friendliness, 6% in decision-making, and 5% in evaluation. We then examined the age group effects. In Sample 1, middle-aged and older adults experienced their typical situations as significantly more interesting than young adults. Similar to Sample 1, older adults in Sample 2 were significantly higher than young adults, but middle-aged adults were more like young adults and not significantly different from them. In Sample 1, there was a non-significant trend for middle-aged adults to rate their situations as involving more decision-making than young adults or older adults. In Sample 2, middle-aged adults experienced their situations as

requiring significantly more decision-making than both young and older adults, similar to the trend in Sample 1. In Sample 1, middle-aged adults experienced their situations as more evaluative than older adults, but in Sample 2, young adults experienced their situations as more evaluative than older adults. Ultimately, we found a pattern that replicated reasonably well across our two samples and supported most of our hypotheses, whereby interestingness was high in older adulthood, decision-making was high in middle age, evaluation was low in older adulthood, and friendliness did not differ by age. The only pattern that ran contrary to our hypotheses was for interestingness, which we predicted to be lowest in older adulthood. We also found evidence for the GLIDE-STRIDE and SST predictions, namely, that situation experience would become more positive with age.

Variabilities in situation experience

We used a series of one-way analysis of variance (ANOVA) models to examine age differences in variability in situation experiences. The results are displayed in the bottom half of Table 4¹. In Sample 1, young adults were significantly more variable in their perception of situations as interesting than middle-aged and older adults. In contrast with the results for Sample 1, variability in interestingness did not differ between age groups in Sample 2. In Sample 1, no significant differences were found between groups for friendliness, but in Sample 2, older adults were significantly more variable in their perception of situations as friendly than young adults. In Sample 1, no significant differences were found between groups for variability in decision-making, although there was a trend for young adults to be less variable. In Sample 2, young adults were significantly less variable in their perception of situations as requiring decision-making than middle-aged and older adults. Finally, in both Sample 1 and Sample 2, middle-aged adults were significantly more variable in their perception of situations as being evaluative than older adults were. In contrast to the age differences in situation experience averages, notably fewer of the age differences in variability of situation experiences replicated across Samples 1 and 2, although some trends were similar. Ultimately, we saw a pattern of mixed results: evaluation became less variable but decision-making tended to become more variable across adulthood. In addition, patterns for interestingness and friendliness were less clear but suggested a higher degree of similarity across age groups. Indeed, these heterogeneous results seem to correspond with the divergent predictions of GLIDE-STRIDE theory, as well as the different patterns of age differences in variability of trait-relevant behavior (Noftle & Fleenor, 2010).

Situation-behavior contingencies

Multilevel modeling (MLM) was used to evaluate situation-behavior contingencies, predicting each Big Five trait-relevant behavior from each centered situation characteristic. Because we were interested in within-person processes, we centered each situation characteristic within each participant so that we could avoid between-person variance

¹We also conducted models that included number of valid reports as a control variable because age groups tended to complete different numbers of reports (see the Introduction). Out of eight total models (four situation categories by two samples), we found that number of reports was a significant predictor of variability in only one model (predicting variability in decision-making in Sample 2). In that model, a larger number of reports predicted less situation variability in decision-making. However, the age differences that were significant in the eight models presented here without number of reports as a control variable also remained significant (and similar) in the models controlling for number of reports.

contamination. Results are presented in Tables 5 and 6. Values are unstandardized betas and thus may be interpreted as how much the trait-relevant behavior characteristic changes with each unit increase in the situation characteristic. Across samples, interestingness was associated with a significant increase in all five categories of trait-relevant behavior (.35, .07, and .09 for Extraversion, Agreeableness, and Emotional Stability in Sample 1, respectively; .39, .14, and .31 for Extraversion, Conscientiousness, and Openness in Sample 2, respectively). Although all increases were significant, Extraversion and Openness showed much larger effects than the other three contingencies, which supported our predictions from Table 1. Friendliness was also associated with a significant increase in all five categories of trait-relevant behavior (.09, .21, and .24 for Extraversion, Agreeableness, and Emotional Stability in Sample 1, respectively; .40, .09, and .18 for Extraversion, Conscientiousness, and Openness in Sample 2, respectively). Although all were significant, Extraversion, Agreeableness and Emotional Stability showed much larger effects, which supported our predictions from Table 1. Decision-making was associated with a significant increase in three categories of trait-relevant behavior (.25 for Extraversion in Sample 1; .27, .41, and .26 for Extraversion, Conscientiousness, and Openness in Sample 2, respectively); was associated with a significant decrease in one category of trait-relevant behavior (−.10 for Emotional Stability in Sample 1); and had no association with Agreeableness. The largest effect was for Conscientiousness, which supported our predictions from Table 1. Finally, Evaluation was associated with a significant increase in three categories of trait-relevant behavior (.24 for Extraversion in Sample 1; .31, .31, and .24 for Extraversion, Conscientiousness, and Openness in Sample 2, respectively); was associated with a significant decrease in one category of trait-relevant behavior (−.09 for Emotional Stability in Sample 1); and had no association with Agreeableness. Although the effects for Conscientiousness and Emotional Stability supported our predictions from Table 1, we observed a positive effect of evaluation on Extraversion, which was opposite from predictions. In addition, the effect of evaluation on Openness was almost as strong as for that of Conscientiousness, an effect that was also unexpected. The situation-behavior contingencies for Extraversion—the only trait measured in both samples—replicated well in terms of both direction and magnitude (except for friendliness).

We also constructed MLMs predicting each Big Five behavior from all four centered situation characteristics simultaneously. As can be seen in parentheses in the across all ages column of Tables 5 and 6, the effects when all four situation characteristics were entered simultaneously into the MLMs were quite similar—though understandably a bit smaller given that the situation characteristics weren't perfectly orthogonal. Still, these results suggest fairly low redundancy in how the situation characteristics independently predict trait-relevant behavior.

Age differences in situation-behavior contingencies

To examine age differences in situation-behavior contingencies, we constructed MLMs that predicted Big Five behavior from both a situation characteristic and age group as a fixed effect. Two-thirds of the contingencies, or 16 of the possible 24, demonstrated age differences; results are presented in Table 5 (Sample 1) and Table 6 (Sample 2). Age differences tended to be in terms of the magnitude of how strongly the trait-relevant

behavior was contingent on the situation experience (rather than about the direction of the contingency). In other words, nearly all significant age differences in situation-behavior contingencies were in a positive direction, whereby increases in situation experience were associated with increases in trait-relevant behavior. We found several age differences in situation-behavior contingencies for Extraversion. In both Sample 1 and Sample 2, the interestingness by Extraversion contingency was stronger for young and middle-aged adults, relative to older adults, suggesting that young and middle-aged adults responded to the same increase in the perceived interestingness of the situation with a greater increase in extraverted behavior than older adults did. In contrast, and across both samples, the decision-making and evaluation by Extraversion contingencies were generally stronger for middle-aged and older adults than for young adults, although the middle-aged adults' contingency did not differ from the other two groups for evaluation in Sample 2. Although these patterns replicated quite well, the two samples had very different age patterns for friendliness. The friendliness by Extraversion contingency was stronger for young adults than for middle aged adults (for the latter group it was essentially zero) in Sample 1, but there were no age differences in Sample 2.

For Agreeableness and Emotional Stability, we found fewer age differences in situation-behavior contingencies, perhaps partly due to the fact that the situation-behavior contingencies for these traits were generally weaker (see Table 5). For Agreeableness, the sole significant age difference was the friendliness by Agreeableness contingency, which was stronger for young adults than for older adults. Similarly, the friendliness by Emotional Stability contingency was stronger for young and middle-aged adults than for older adults. The interestingness by Emotional Stability contingency was stronger for young adults than for middle-aged adults.

For both Conscientiousness and Openness, three of the four possible contingencies were significantly different by age group. For Conscientiousness, all of the age differences followed similar patterns. We found that middle-aged and older adults had stronger contingencies for Conscientiousness related to interestingness, friendliness, and decision-making relative to young adults. For Openness, the age differences were differently patterned. The interestingness by Openness contingency was stronger for middle-aged adults than for young and older adults, the only statistically significant example wherein the magnitude of a contingency peaked in midlife. On the other hand, the decision-making and evaluation by Openness contingencies were stronger for middle-aged and older adults than for young adults, although the older adults' contingency did not significantly differ from the other two groups for evaluation.

We ultimately found a pattern of age differences in situation-behavior contingencies in which the majority of differences were between relatively younger and older ages, not between middle-aged adults versus the other two groups. In addition, middle-aged adults had contingencies that were more similar in magnitude to those of older adults, whereas young adults' contingencies were most different from the other two groups. Specifically, for the 16 contingencies that showed significant age differences, young adults were significantly different from middle aged adults in 11 cases, young adults were significantly different from older adults in 12 cases, but middle-aged adults were significantly different from older

adults in only 4 cases. However, the patterns were not uniform in terms of magnitude. Older adults had stronger contingencies than young adults in eight cases (many of which concerned the situational characteristics of decision-making and evaluation), but young adults had stronger contingencies than older adults in four cases (each of which concerned the situational characteristics of either friendliness or interestingness). Similarly, middle-aged adults had stronger contingencies than young adults in nine cases, and weaker contingencies than young adults in only two cases. Finally, we found that age differences in contingencies were more pronounced in some trait domains (75% of the Extraversion, Conscientiousness and Openness contingencies showed significant age differences) than others (only 50% of the Emotional Stability and 25% of the Agreeableness contingencies showed significant age differences).

Discussion

The present study examined age differences in situation experience averages, in within-person variability in situation experience, and in situation-behavior contingencies in two samples of young, middle-aged, and older adults. We investigated hypotheses on age differences drawn from several theories, including GLIDE–STRIDE theory (Fleeson & Jolley, 2006) and socioemotional selectivity theory (Carstensen & Mikels, 2005). In addition, we investigated targeted hypotheses for two of our questions. First, we tested hypothesized patterns of age differences in situation experience averages based on a small literature about age differences in situation-related activities (e.g., Brown & Rauthmann, 2016; Wrzus et al., 2016). Second, we tested hypotheses about which Big Five personality states would be most contingent on the four situation characteristics based on a small literature on situation-behavior contingencies (e.g., Brown & Rauthmann, 2016; Fleeson, 2007). The study is among the first to examine personality processes having to do with situation experience and trait-relevant behavior within a developmental context beyond young adulthood. We hope this research can contribute to a new literature seeking to connect personality processes and personality development (Baumert et al., 2017; Diehl, Hooker, & Sliwinski, 2015; Wrzus & Roberts, 2017).

Findings for Situation Experience Averages and Variabilities and Implications

We developed two types of hypotheses for situation averages. First, we formed general hypotheses from GLIDE-STRIDE theory that situation experience would be more positive as people aged. Second, we hypothesized specific patterns for different situation characteristics based on the most consistent patterns of predictions from Table 1. Specifically, we predicted that interestingness and evaluation would be lower in older adults than middle-aged adults and that decision-making would be highest in middle-aged adults. The current study supported some of our hypotheses. As hypothesized, older adults experienced their situations as less evaluative than middle-aged adults did, but also less than young adults did. As hypothesized, middle-aged adults tended to experience their daily situations as involving more decision-making than young or older adults. However, contrary to our specific hypotheses (but in support of our general hypothesis of increasing positivity of situation experiences), we found that older adults, relative to young adults, experienced their typical situations as more interesting. Due to the heterogeneity of the patterns in Table

1, we did not offer a hypothesis for age differences in situation experience of friendliness, and we found no age differences across either sample for this situation characteristic. This latter finding potentially reflects the fact that our friendliness category is relevant to the DIAMONDS dimensions of both positivity and sociality. In prior research, these dimensions showed age patterns that not only tended to have different trajectories that would flatten out if combined² but also sometimes did not replicate well across different samples (Brown & Rauthmann, 2016). This set of findings suggests broad support for the developmental mechanisms of Learning and Developmental regulation. Accordingly, as people age, they increasingly select situations that fit their personalities and also demonstrate skills in responding to the situations in which they find themselves, and therefore tend to construe their situations more positively. At the same time, the finding that decision-making tends to peak in midlife, possibly due to constraints in older adulthood which would limit situations in which choices are made, highlights that there is also heterogeneity in situation experience across the adult lifespan. These findings also connect well with developmental tasks for different adult age periods (Hutteman, Hennecke, Orth, Reitz, & Specht, 2014). Developmental tasks for young adulthood such as selecting a mate, finishing education and starting a career, and establishing a social network, and sets of tasks for middle age such as cooperating with a romantic partner, raising children, beginning to care for aging parents, and performing well at work all involve a regular and sometimes routine share of evaluation. In addition, middle age involves a great deal of decision-making, both in career and family spheres (both involving children and aging parents). Interest would seem to figure most prominently as a feature of the typical identity exploration and newfound freedom of young adulthood. However, interest also makes sense as a feature of retirement in older adulthood, when a second wave of newfound freedom is realized in leaving the workforce, easing of parental roles, and having time for leisure and self-determined activities. Situation experience indeed appears to be a phenomenon that develops with age, and furthermore develops in somewhat complex ways.

The density distributions we constructed for both samples revealed that although there was a considerable amount of variability in situation experience that was accounted for by between-person variance (i.e., individual differences in situation experience), there was even more within-person variance in situation experience (i.e., the same person construing situations differently from moment to moment). We also found that variability in situation experience was quite stable within individuals from the beginning to the end of a week (Sample 2) and from week to week (Sample 1). This contributes to a growing literature demonstrating considerable within-person variability in experience of situations (Sherman et al., 2015) and attempting to explain it.

Our general hypothesis for age differences in situation variabilities from GLIDE-STRIDE theory was that within-person variability in situation experience should generally remain fairly high in middle-aged and older adults due to developmental regulation, but perhaps be slightly lower in these groups compared with young adults due to the stabilizing forces of Learning and the Environment. We found somewhat heterogeneous results for our four

²We thank an anonymous reviewer for this suggestion.

situation characteristics; specifically, evaluation was less variable in older than in middle-aged adults, decision-making was more variable in middle-aged and older adults than in young adults, and friendliness and interestingness did not reliably differ in variability by age group across the two samples (but did remain high). Given the high amount of variability found for each age group, the current findings support the ongoing influence of Developmental regulation across the lifespan and also suggest that retirement may be more of a dynamic period psychologically than is often assumed. Because the findings demonstrate that there is a lot of variability in situation experience across the lifespan, it suggests that this variability can potentially help to predict the large amount of variability that is also typically observed in trait-relevant behavior, which is what we observed when we investigated situation-behavior contingencies.

Findings for Situation-Behavior Contingencies and Implications

The current findings add to a small literature on situation-behavior contingencies (e.g., Fleeson, 2007; Minbashian et al., 2010; Sherman et al., 2015). Many of our hypothesized contingencies ended up being quite strong, with trait-relevant behaviors showing a third or more of a unit increase with each unit increase in the associated situation experience. We found that interestingness was most strongly associated with increases in extraverted and open behavior; friendliness with increases in extraverted, agreeable, and emotionally stable behavior; and decision-making with increases in conscientious behavior, all which we had hypothesized. Our findings for evaluation were more unexpected. As predicted, we found that evaluation was associated with increases in conscientious behavior and decreases in emotionally stable behavior (i.e., increases in neurotic behavior). However, we found that evaluation was associated with sizable increases in open behavior, which we had not predicted, and that evaluation was associated with increases in extraverted behavior. Our measure of Openness (i.e., imaginative, creative, perceptive) tends to tap more into the intellect rather than aesthetic or unconventionality aspects of the trait, and such qualities are probably very usefully deployed when one is under evaluation. The tendency for people to increase rather than decrease in extraverted behavior when they are being evaluated, unlike what Brown and Rauthmann (2016) and other studies find for the DIAMONDS characteristic of negativity, likely speaks to the fact that evaluation is more complex than negativity and also includes a component that is reward motivated rather than only punishment averse.

Our examination of age differences in situation-behavior contingencies was somewhat exploratory, and we did not make specific predictions for situation characteristics. However, our general hypothesis from GLIDE-STRIDE theory was that contingencies should remain relatively similar across the lifespan or even increase due to the impact that the mechanisms of Learning and Developmental regulation could have on tailoring behavior to situations. Not only did we find that patterns of situation-behavior contingencies did tend to replicate in age groups older than young adults, but in fact, we found that middle-aged and older adults often (but not always) had stronger overall situation-behavior contingencies than young adults. This could reflect several intriguing possibilities. First, it could reflect that young adults are not able or willing to carefully respond as much to the demands of the situation. As previously mentioned, many young adults are experiencing a newfound independence

(i.e., are no longer under their parent's direct control) and are therefore still learning how to appropriately modify their behavior to match situational demands. Second, it might mean that young adults are responding to other momentary social-cognitive features, such as their goals or drives, rather than situation experiences (McCabe & Fleenor, 2012; 2016). Heckhausen's (2002) lifespan development theory of control distinguishes between primary and secondary control in goal striving; the former is about directing behavior externally in order to change one's environment whereas the latter is about changing one's internal processes to adapt to one's environment. Primary control is a hallmark of early adulthood whereas secondary control is a hallmark of older adulthood. Perhaps responding more strongly to situational experience indicates a strategy that is more about adapting to the world than trying to change it. Third, perhaps young adults are more strongly responding to other situation experiences that we simply did not assess, such as mating—in other words, perhaps the content of the situation experience really matters. One illustrative example that also replicated over the two samples was that older adults' extraverted behavior increased more than that of young adults when experiencing the same degree of change in decision-making or evaluation. On the other hand, young adults' extraverted behavior increased more than that of older adults when experiencing the same amount of increase in interestingness. This fits a more general trend—stronger contingencies for middle-aged and older adults were typically for the situational experiences of decision-making and evaluation. On the other hand, the few cases of stronger contingencies for young adults were always for experiences of friendliness and interestingness. Although we predicted (and often found) stronger situation-behavior contingencies for middle-aged and older adults, we anticipated that situations experienced simultaneously as more positive and less variable could produce weaker situation-behavior contingencies—this is indeed what we tended to find for interestingness in older adults. Our findings also suggest some potentially different psychological behavioral mechanisms associated with situation experience in different age groups, mechanisms which warrant further testing. Increases in the interestingness of a situation seemed to elicit increases in conscientious behavior in middle-aged and older adults—for older adults, increases comparable in magnitude to those of extraverted behavior—but on average, no changes in conscientious behavior among young adults. This suggests that, in rare cases, age differences in contingencies can differ by kind rather than only magnitude. Although the differences between age groups is almost always a question of magnitude than direction (or absence), the fact that people beyond young adulthood are responding more strongly to mixed or negative situation characteristics rather than positive ones also suggests a possible link to secondary control and disengaging from goals that are found to be unattainable. Clearly, some of these explanations are rather speculative but also quite interesting. More research is needed to help fully explain age differences in situation-behavior contingencies.

Limitations and Future Directions

One major limitation of the current research is the non-experimental nature of the design used in this study. Whereas it is theorized here that the situational experience influences an individual's trait-relevant behavior, we clearly cannot claim causality. Certainly, the direction of influence could flow the other way—trait-relevant behavior may influence situational experience. It is also possible that third variables such as the STRIDE component

of resource availability are influencing both situation experience and trait-relevant behavior. The fact that both situations and behavior were assessed essentially simultaneously does not even allow us to temporally disentangle the possible direction of influence unlike the sequential technique Wrzus et al. (2016) were able to implement. Although we believe that the ecological validity of the everyday life ESM approach features certain benefits over the large amount of control but artificiality of an experimental approach, future ESM work could use burst designs allowing for temporal sequences of situation experience and behaviors to be observed.

Another limitation of the current studies is the use of only a single rater source. This poses two issues. First, the situation and behavior ratings both extend from the same source, the self, which makes the data subject to self-related biases such as self-deception and impression management. Although self-related biases would be ameliorated by substituting direct observation of behavior, the latter method would introduce other non-self, social biases of its own, such as perceiver stereotypes about age, gender, and ethnicity, as well as possible problems with ecological validity (Furr, 2009). In a target article, Furr (2009) argued that behavior ratings obtained through ESM, like direct observations of behavior, represent one of the best ways of assessing actual behavior. Second, there is a certain amount of subjectivity present given that situation and behavior ratings were drawn from the same source. To cleanly separate situations from behavior, Rauthmann et al. (2015) argue for the importance of using additional rating sources as a tool to differentiate between objective and subjective aspects of situations. Because we used a single rater source, we cannot be sure of the extent to which age differences in situations are a factor of the age of the perceiver experiencing his or her situations versus a factor of objective differences between situations encountered by people of different ages. However, while Rauthmann et al.'s suggestion to use more uninvolved (and objective) raters or multiple raters certainly has merit, the subjective meaning of situations must be considered when evaluating situation-behavior contingencies specific to an individual and the features of the situation they themselves are processing (Nofle & Gust, 2015). However, it would be quite interesting to investigate in the future whether the same types or strengths of situation-behavior contingencies are found when situations are rated more objectively—without the perspective of the individual directly experiencing them. To the extent that people of various ages perceive the same situation differently, it will be challenging to figure out how to obtain objective raters who can report on situations experienced by people of different ages without being biased by their own age.

A third limitation is the cross-sectional nature of this research and the associated issues that arise from comparing groups of individuals of different ages. Although efforts were made to create groups similar on all bases except age (e.g., recruiting middle-aged and older adults who had at least some college education), it is still possible that cohort effects may have influenced the age differences. In addition, some of the age groups might be more representative of their cohort than others. Many young adults attend college, and many college students serve as participants in psychological research. A much smaller and perhaps more select group of middle-aged and older adults seek out opportunities as a research participant. However, interpretations of age group differences in this study assumed the representativeness of each group to its respective cohort population. Although the

educational background requirement helps to ensure that age differences did not simply result from a young adult college population, the more positive situation experience of older adults could have resulted from the fact that educational attainment has been linked with later healthy aging (Kubzansky, Berkman, Glass, & Seeman, 1998). As ESM approaches have become more mainstream, longitudinal studies will become possible and can compare personality processes in the same individuals as they age, providing a stronger test of the current developmental questions.

A fourth limitation was the relatively small sample size of Sample 1. Although ESM studies are often small not only because they are relatively challenging to conduct, they also do not require the larger sample sizes of typical cross-sectional questionnaire research because each person is assessed many times and provides much more robust estimates reflecting their psychological processes. However, many of the between-person analyses in Sample 1 did not have as high statistical power as would be preferable. Hence, if there were discrepancies in findings between our samples, we tended to favor the findings of Sample 2 with its higher statistical power. However, this is less than ideal; future research should include replications that have high power. We also had some missing data in our two studies; reports were excluded from analysis if an eighth or more of the total items had missing values. We assumed that the small amount of missing values in the data were missing at random; however, it is possible that the missing values were missing systematically.

Fifth, there are several other ways of examining situations that the current research did not investigate. First, we could have included additional parameters such as skew and kurtosis alongside our analyses of situation averages and variabilities³. Second, and as mentioned previously, the set of situational characteristics examined here was by no means exhaustive and thus limits our ability to draw strong conclusions. Indeed, age differences in average situation experience, variability in situation experience, and/or situation-behavior contingencies might depend on the particular situational characteristics included in the current study. For example, the fact that we found more pervasive age differences in some trait domains than others in part probably reflects how germane the selected situation categories were to the set of traits, as well as differences in statistical power across the two studies which studied different sets of traits. In addition, there are at least two characteristics in the DIAMONDS taxonomy—deception and mating—that were not reflected at all in the present situation assessment. Based on the findings of Brown and Rauthmann (2016), if we had included relevant situation characteristics for those two categories, we would have likely found (for our specific age ranges) that deception was highest for older adults whereas mating was highest for young adults. These findings would buck the trend we found of more positive situation experiences in older adulthood. These two situation categories also suggest heterogeneity in average situation experience in middle age depending on which situation categories are under study. Although we found that situations involving decision-making tended to be highest in middle-aged adults (parallel to previous results for Duty), Brown and Rauthmann (2016)'s findings (and Rauthmann et al. (2014)'s results on a middle-aged sample) suggest that middle-aged people are lowest in situation experiences involving

³We thank John Rauthmann, one of the reviewers, for suggesting other intriguing levels of analysis such as skew and kurtosis but decided to leave them for future investigation given the large number of analyses already included in the current paper

deception and mating. Although the DIAMONDS framework has proven to be a highly useful one for study of personality processes, it may not represent all of the important situational characteristics relevant to traits (Nofle & Gust, 2015). Although there is a tradeoff between precision of assessment and content coverage in ESM studies due to the small amount of items one may feasibly administer repeatedly, it will be useful in future research to widen the number of situation characteristics assessed. For example, Rauthmann and Sherman (2016) have now developed short 8-item measures to fully assess the DIAMONDS dimensions. Third, the current effort did not assess classes of situations which, in addition to situation characteristics, may help to predict some of the within-person variability (Rauthmann et al., 2015). For example, Dweck argues that classes of situations may activate different conditionalized mental representations (consisting of beliefs, emotions, and action tendencies) that guide behavior in a particular class of situation (e.g., with family), whereas behavior is guided differently in other classes of situations (e.g., with coworkers). Finally, in predicting trait-relevant behavior, as in the analyses that examined situation-behavior contingencies, it must be said that interpretations of situations are only one social cognitive feature that play a role. The STRIDE component of GLIDE-STRIDE theory elucidates five other categories of proximal influences on behavior; for example, previous research has demonstrated the utility of goals (McCabe & Fleeson, 2012; 2016).

Conclusion

The current study found a host of age differences in situation averages, situation variabilities, and situation-behavior contingencies which replicated across two samples and generally supported developmental theoretical predictions about how these phenomena might differ across age. There are at least three implications of these findings. First, the findings divulge that future research on personality processes should take age into account because there were so many observed age differences: age clearly matters to personality processes. Second, the findings suggest that, if anything, middle-aged and older adults demonstrate more robust patterns of personality processes than young adults and are worth studying because they reveal some interesting conclusions about development and aging. Third, the findings demonstrate that situation experience is an important social-cognitive factor that helps to explain the large amount of within-person variability in trait-relevant behavior.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Research presented in this manuscript was supported by the National Institute of Mental Health of the National Institutes of Health under award number R01MH70571. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. We want to thank William Fleeson for letting us use his data from the Integrating Process and Structure in Personality grant for the current project.

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Summary of predictions for age differences in average situation experiences and situation-behavior contingencies

Situation characteristic	Predicted age differences in average situation experience		Predicted contingent trait-relevant behavior		
	Predicted age patterns from young→middle adults and middle→older adults	Type of evidentiary basis for predicted age pattern	Article supporting prediction	Most relevant traits for situation characteristics	Article(s) supporting prediction
Interestingness	//	Trait: O, E-SV Activity: I	B&R	Openness	B&R, D&P
Friendliness	∧	Activity: I	B&R	Extraversion	LDGS&S, D&P
	//	Traits: A, ES	B&R	Extraversion	B&R, F, H&R
	//	Trait: E-SV	B&R	Agreeableness	B&R, F, H&R
	∨	Activity: FF	WW&R	Emotional Stability	B&R
	-∧	Activity: C	WW&R		
Decision-making	∨	Activity: P	B&R		
	-∧	Activity: S	B&R		
	//	Trait: C	B&R	Conscientiousness	B&R, F
	∧	Activity: LTV	WW&R		
	-∧	Activity: SW	WW&R		
Evaluation	∧	Activity: D	B&R		
	//	Traits: ES, C, E-SD	B&R	(-) Emotional Stability	B&R, D&P
	-∧	Activities: SW, C	WW&R	(-) Extraversion	B&R
	∧	Activity: N	B&R	Conscientiousness	MW&B

Note. For the “Predicted age patterns...” column, the \ symbol represents a decrease from one group to another; the / symbol represents an increase from one group to another; and the – symbol represents no change between groups. The first symbol represents predicted differences from young to middle-aged adults; the second symbol represents predicted differences from middle-aged to older adults. We discuss these predictions in the text on pages 15–16. For the “Type of evidentiary basis...” column, “Trait” refers to age patterns for traits that Brown and Rauthmann (2016, Table 1, p. 669) mapped conceptually onto the DIAMONDS situation characteristics, which we further mapped onto our situation characteristics (shorthand for the specific Big Five traits are E-SV = the social vitality aspect of Extraversion, E-SD = the social dominance aspect of Extraversion, A = Agreeableness, C = Conscientiousness, ES = Emotional Stability, and O = Openness). For the same “Type of evidentiary basis...” column, “Activity” refers to the age patterns results for activities found by Brown and Rauthmann (2016) and Wrzus, Wagner, & Riediger (2016), which we map onto our situation characteristics (shorthand for activities are: P = positivity, S = sociality, I = intellect, D = duty, N = negativity, FF = time spent with friends and family, C = time spent with colleagues, TSW = time spent at school or work, LTV = time spent in leisure or watching TV). For the “Most relevant traits...” column, we listed the traits that previous literature would suggest were most relevant for each situation characteristic. We discuss these predictions in the text on pages 13–14. For the “Article(s) supporting prediction” columns, shorthand references are used to substantiate the hypothesized age patterns for each situational characteristic or each situation-Big Five behavior contingency. B&R corresponds to Brown & Rauthmann (2016); WW&R corresponds to Wrzus, Wagner, & Riediger (2016); LDGS&S corresponds to Lucas, Diener, Grob, Suh, & Shao (2000); H&R corresponds to Huang & Ryan (2011); F corresponds to Flesson (2007); MW&B corresponds to Minbashian, Wood, & Beckmann (2010); and D&P corresponds to Denissen & Penke (2008).

Table 2

Means, standard deviations, and intercorrelations for situation experiences and trait-relevant behavior in Sample 1

	Interestingness	Friendliness	Decision-making	Evaluation	Extraversion	Agreeableness	Emot. Stability
	4.18 (0.68)	5.10 (0.52)	2.91 (0.84)	2.12 (0.73)	3.42 (0.56)	5.17 (0.48)	4.97 (0.65)
Interestingness	.48***	.24 (p=.03)	.03 (p=.80)	-.23 (p=.04)	-.21 (p=.06)	.50***	.51***
Friendliness	.24***	.43***	.20 (p=.07)	.05 (p=.66)	.17 (p=.12)	.47***	.46***
Decision-making	.14***	-.09***	-.06 (p=.60)	-.25 (p=.03)	.14 (p=.23)	.62***	.47***
Evaluation	.10***	-.13***	.53***	.70***	.44***	.11 (p=.31)	-.03 (p=.78)
Extraversion	.30***	.09***	.38***	.32***	.37***	-.09 (p=.42)	-.11 (p=.32)
Agreeableness	.23***	.41***	.03 (p=.04)	-.01 (p=.44)	.07***	.02 (p=.84)	.05 (p=.67)
Emot. Stability	.25***	.35***	-.15***	-.13***	-.06***	.53***	.71***
Mean (SD)	4.27 (1.28)	5.14 (1.05)	2.92 (1.65)	2.04 (1.48)	3.41 (1.25)	5.24 (0.76)	5.03 (0.94)

Note. N = 2970–3966 (unaggregated reports) and 80 (aggregated reports). M = mean; SD = standard deviation. All correlations are accompanied with exact p-values except for ones that were significant at the $p < .001$ level, which are simply noted ***. Values below the diagonal (and labels at left and top) are for unaggregated reports. Values above the diagonal (and labels at top and right) are for aggregated (i.e., person-level) reports.

Table 3

Means, standard deviations, and intercorrelations for situation experiences and trait-relevant behavior in Sample 2

	Interestingness	Friendliness	Decision-making	Evaluation	Extraversion	Conscientious.	Openness
	3.42 (0.75)	3.73 (0.84)	3.34 (0.85)	2.63 (1.08)	3.16 (0.62)	3.62 (0.70)	3.05 (0.76)
	.17 (p=.01)	-.02 (p=.71)	.117 (p=.07)	-.24***	.01 (p=.86)	.12 (p=.07)	-.00 (p=.97)
Interestingness							
Friendliness	.40***		.46***	.21 (p=.002)	.50***	.43***	.49***
Decision-making	.25***	.17***	.22***	.15 (p=.02)	.60***	.26***	.37***
Evaluation	.22***	.17***	.30***	.30***	.49***	.66***	.52***
Extraversion	.47***	.59***	.39***	.30***	.28***	.26***	.24***
Conscientiousness	.23***	.17***	.54***	.30***	.48***	.60***	.60***
Openness	.45***	.33***	.44***	.28***	.59***	.55***	.63***
Mean (SD)	3.44 (1.57)	3.76 (1.88)	3.37 (1.66)	2.62 (1.65)	3.18 (1.31)	3.64 (1.39)	3.06 (1.24)

Note. N = 5494–5518 (unaggregated reports) and 236 (aggregated reports). M = mean; SD = standard deviation. All correlations are accompanied with exact p-values except for ones that were significant at the $p < .001$ level, which are simply noted ***. Values below the diagonal (and labels at left and bottom) are for unaggregated reports. Values above the diagonal (and labels at top and right) are for aggregated (i.e., person-level) reports.

Table 4
Age group differences for situation experience averages and variabilities in Samples 1 and 2

Situation averages (M)	Sample 1				Sample 2			
	F	Young adults	Middle-aged adults	Older adults	F	Young adults	Middle-aged adults	Older adults
Interestingness	14.36 (p<.001)	3.70 _b	4.34 _a	4.54 _a	6.54 (p=.002)	3.33 _b	3.30 _b	3.70 _a
Friendliness	2.35 (p=.102)	4.94	5.10	5.26	0.08 (p=.927)	3.75	3.70	3.74
Decision-making	2.82 (p=.066)	2.70	3.21	2.78	7.15 (p<.001)	3.17 _b	3.67 _a	3.35 _b
Evaluation	3.37 (p=.040)	2.20 _{ab}	2.30 _a	1.80 _b	7.41 (p<.001)	2.88 _a	2.59 _{ab}	2.25 _b
Situation variabilities (SD)								
Interestingness	9.55 (p<.001)	1.26 _a	1.07 _b	0.94 _b	0.27 (p=.762)	1.36	1.34	1.39
Friendliness	1.46 (p=.239)	0.97	0.92	0.82	6.25 (p=.002)	1.60 _b	1.71 _{ab}	1.80 _a
Decision-making	2.59 (p=.082)	1.25	1.43	1.43	10.75 (p<.001)	1.31 _b	1.53 _a	1.51 _a
Evaluation	3.58 (p=.033)	1.26 _{ab}	1.39 _a	1.05 _b	4.28 (p=.015)	1.19 _{ab}	1.30 _a	1.03 _b

Note. N = 77 (Sample 1) and 236 (Sample 2). All F-tests are accompanied with exact p-values except for ones that were significant at the $p < .001$ level. Values for each of the three age groups are means for each of the situational characteristics in the top half of the table and standard deviations in the bottom half of the table. Different subscripts indicate significant differences between values in each row ($p < .05$).

Table 5
Age group differences in situation-behavior contingencies for extraversion, agreeableness, and emotional stability in Sample 1

Trait-relevant Behavior	Contingency on Situation Characteristic	F (One Situation Predicting Each Trait-Relevant Behavior)	Average Situation-Behavior Contingency	F (All Four Situations Simultaneously Predicting Each Trait-Relevant Behavior)	Average Independent Situation-Behavior Contingency	F (One Situation Predicting Each Trait-Relevant Behavior with Age as a Fixed Effect)	Average Situation-Behavior Contingency by Age		
							Young Adults	Middle-aged Adults	Older Adults
Extraversion	Interestingness	193.81 ($p<.001$)	.35	116.41 ($p<.001$)	.29	11.26 ($p<.001$)	.46 _a	.41 _a	.20 _b
	Friendliness	9.52 ($p=.003$)	.09	4.76 ($p=.033$)	.05	5.70 ($p=.006$)	.20 _a	-.01 _b	.10 _{ab}
	Decision-making	123.53 ($p<.001$)	.25	63.45 ($p<.001$)	.17	8.39 ($p<.001$)	.12 _b	.35 _a	.27 _a
	Evaluation	85.42 ($p<.001$)	.24	16.83 ($p<.001$)	.08	4.03($p=.023$)	.14 _b	.28 _a	.30 _a
Agreeableness	Interestingness	30.15 ($p<.001$)	.07	15.66 ($p<.001$)	.05	1.43 ($p=.247$)	.10	.05	.06
	Friendliness	91.43 ($p<.001$)	.21	79.92 ($p<.001$)	.20	4.52 ($p=.015$)	.28 _a	.19 _{ab}	.13 _b
	Decision-making	0.98 ($p=.325$)	-.01	0.05 ($p=.831$)	-.00	2.48 ($p=.093$)	-.04	.02	-.00
	Evaluation	1.42 ($p=.239$)	-.02	0.67 ($p=.418$)	-.01	0.91 ($p=.411$)	-.03	.01	.00
Emotional Stability	Interestingness	26.60 ($p<.001$)	.09	24.89 ($p<.001$)	.08	3.55 ($p=.035$)	.15 _a	.04 _b	.08 _{ab}
	Friendliness	91.54 ($p<.001$)	.24	84.44 ($p<.001$)	.21	7.31 ($p=.001$)	.28 _a	.28 _a	.10 _b
	Decision-making	91.27 ($p<.001$)	-.10	39.25 ($p<.001$)	-.07	1.60 ($p=.210$)	-.13	-.10	-.08
	Evaluation	34.25 ($p<.001$)	-.09	9.50 ($p=.003$)	-.05	0.96 ($p=.387$)	-.05	-.10	-.10

Note. N = 77–80 (Sample 1). The table includes the results of sets of three Multilevel Models (MLMs). From left to right, the first set of MLMs each predict a trait-relevant behavior from one (centered) situation category; the second set of MLMs each predict a trait-relevant behavior simultaneously from all four (centered) situation categories (i.e., parallel to a multiple regression); the third set of MLMs predict a trait-relevant behavior from one (centered) situation category with age also entered as a fixed effect. All F tests are accompanied with exact p-values except for those that were significant at the $p < .001$ level. For each MLM, results of the F test statistic, significance of that F test, and a beta representing the average situation-behavior contingency are reported. For the third set of MLMs, there are three betas reported which represent the average situation-behavior contingency for each age group. For the latter, different subscripts indicate significant differences between age group values in each row ($p < .05$). All of the age-group specific contingencies were significantly different than zero ($p < .05$) except for Friendliness on Extraversion for middle-aged adults ($b = -.01$; $p = .839$); Interestingness on Emotional Stability for middle-aged adults ($b = .04$; $p = .183$); Decision-making on Agreeableness for young adults ($b = -.04$; $p = .137$), for middle-aged adults ($b = -.02$; $p = .200$), and for older adults ($b = -.00$; $p = .811$); and Evaluation on Agreeableness for young adults ($b = -.03$; $p = .259$), for middle-aged adults ($b = .01$; $p = .587$), and for older adults ($b = .00$; $p = .929$).

Table 6
Age group differences in situation-behavior contingencies for extraversion, conscientiousness, and openness in Sample 2

Trait-relevant Behavior	Contingency on Situation Characteristic	F (One Situation Predicting Each Trait-Relevant Behavior)	Average Situation-Behavior Contingency	F (All Four Situations Simultaneously Predicting Each Trait-Relevant Behavior)	Average Independent Situation-Behavior Contingency	F (One Situation Predicting Each Trait-Relevant Behavior with Age as a Fixed Effect)	Average Situation-Behavior Contingency by Age		
							Young Adults	Middle-aged Adults	Older Adults
Extraversion	Interestingness	702.05 (p<.001)	.39	208.07 (p<.001)	.19	9.28 (p<.001)	.44 _a	.39 _a	.30 _b
	Friendliness	1274.50 (p<.001)	.40	665.97 (p<.001)	.30	1.56 (p=.212)	.42	.39	.38
	Decision-making	246.10 (p<.001)	.27	171.26 (p<.001)	.16	11.74 (p<.001)	.18 _b	.37 _a	.30 _a
	Evaluation	263.91 (p<.001)	.31	77.95 (p<.001)	.11	3.45 (p=.034)	.26 _b	.35 _{ab}	.37 _a
Conscientious-ness	Interestingness	53.01 (p<.001)	.14	3.12 (p=.079)	.03	15.73 (p<.001)	.03 _b	.26 _a	.21 _a
	Friendliness	42.80 (p<.001)	.09	4.91 (p=.028)	.03	6.31 (p=.002)	.04 _b	.15 _a	.13 _a
	Decision-making	662.23 (p<.001)	.41	487.30 (p<.001)	.35	10.03 (p<.001)	.34 _b	.50 _a	.43 _a
	Evaluation	323.67 (p<.001)	.31	109.52 (p<.001)	.16	1.78 (p=.172)	.30	.36	.29
Openness	Interestingness	546.44 (p<.001)	.31	341.34 (p<.001)	.22	7.14 (p<.001)	.27 _b	.39 _a	.30 _b
	Friendliness	255.27 (p<.001)	.18	53.29 (p<.001)	.07	1.34 (p=.264)	.16	.21	.17
	Decision-making	322.84 (p<.001)	.26	205.95 (p<.001)	.18	17.42 (p<.001)	.17 _b	.33 _a	.32 _a
	Evaluation	225.05 (p<.001)	.24	53.48 (p<.001)	.09	3.97 (p=.020)	.20 _b	.31 _a	.24 _{ab}

Note. N = 236 (Sample 2). The table includes the results of sets of three Multilevel Models (MLMs). From left to right, the first set of MLMs each predict a trait-relevant behavior from one (centered) situation category; the second set of MLMs each predict a trait-relevant behavior from one (centered) situation category with age also entered as a fixed effect. All F tests are accompanied with exact p-values except for those that were significant at the $p < .001$ level. For each MLM, results of the F test statistic, significance of that F test, and a beta representing the average situation-behavior contingency are reported. For the third set of MLMs, there are three betas reported which represent the average situation-behavior contingency for each age group. For the latter, different subscripts indicate significant differences between age group values in each row ($p < .05$). All of the age-group specific contingencies were significantly different than zero ($p < .05$) except for Interestingness on Conscientiousness for young adults ($b = .03$; $p = .245$) and Friendliness on Conscientiousness for young adults ($b = .04$; $p = .085$).