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Five Factor Model Personality Traits and Subjective Cognitive Failures

Angelina R. Sutin¹, Damaris Aschwanden¹, Yannick Stephan², Antonio Terracciano¹

¹Florida State University College of Medicine

²Euromov, University of Montpellier

Abstract

Momentary lapses in memory, perception, or action, known as cognitive failures, are relatively common. These lapses may reflect, in part, aspects of psychological functioning, such as personality traits. The present research addresses how Five Factor Model personality traits and facets are associated with cognitive failures, and whether these associations are accounted for by depressed affect. Participants ($N=5,133$; 50% female) who ranged in age from 18 to 91 completed an online survey that assessed their personality traits, cognitive failures, and depressed affect. Higher neuroticism was associated with more cognitive failures, whereas Conscientiousness and Agreeableness were associated with fewer failures, controlling for sociodemographic characteristics. Controlling for depressed affect reduced the associations in most cases by about 50%, but most relations were still apparent. Facet-level analyses provided a more detailed picture of how the traits are associated with cognitive failures. Subjective perceptions of lapses in cognition are associated with basic personality traits and may reflect, in part, processes related to those traits beyond depressed affect.

Keywords

Subjective cognition; Cognitive failures; Facets; Cognitive aging; Blunders

It is not uncommon for someone to walk into a room and forget why they went there or for someone to meet another person and immediately forget their name. These experiences are examples of cognitive failures that occur in daily life. Specifically, cognitive failures are defined as momentary lapses in memory, perception, and/or action that result in mistakes or errors (Broadbent, Cooper, FitzGerald, & Parkes, 1982). Cognitive failures are often referred

Address correspondence to: Angelina R. Sutin, Ph.D., Florida State University College of Medicine, 1115 W. Call Street, Tallahassee, FL 32306, (850) 645-0438, Fax: (850) 645-1773, angelina.sutin@med.fsu.edu.

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Angelina R. Sutin: Conceptualization, Methodology, Formal Analysis, Writing-Original Draft, Funding Acquisition

Damaris Aschwanden: Conceptualization, Writing-Review & Editing

Yannick Stephan: Conceptualization, Writing-Review & Editing

Antonio Terracciano: Conceptualization, Methodology, Writing-Review & Editing, Funding Acquisition

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to as subjective cognitive failures or subjective cognition because it is the individual's own perception of their cognitive functioning (Jessen et al., 2014). Such failures are common and most people experience them from time to time. These failures may be due, in part, to factors that range from situational (e.g., boredom; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997) to neurological (e.g., hippocampal volume; van Norden et al., 2008). There are individual differences in how often people have these experiences (Unsworth, Brewer, & Spillers, 2012). Personality, as defined by the Five Factor Model (FFM; McCrae & John, 1992), may be one component of psychological functioning associated with common cognitive failures.

The FFM operationalizes an individual's characteristic ways of thinking, feeling, and behaving along five broad dimensions (McCrae & John, 1992): Neuroticism (the tendency to feel negative emotions and vulnerability to stress), Extraversion (the tendency to be active, social, and outgoing), Openness (the tendency to be creative and unconventional), Agreeableness (the tendency to be trusting and compassionate), and Conscientiousness (the tendency to be organized, disciplined, and responsible). The growing literature on personality and cognitive failures has focused primarily on Neuroticism. From this literature, there is consistent evidence that higher Neuroticism is associated with greater frequency of subjective cognitive failures and complaints (Aschwanden, Kliegel, & Allemand, 2018; Könen & Karbach, 2018; Lange & Süß, 2014; Mecacci, Righi, & Rocchetti, 2004; Snitz et al., 2015; Wilhelm, Witthöft, & Schipolowski, 2010). There is also some evidence that higher Conscientiousness is associated with fewer such failures (Könen & Karbach, 2018; Snitz et al., 2015). A related literature on subjective cognitive impairment likewise implicates Neuroticism and Conscientiousness (Koller, Hill, Mogle, & Bhang, 2019). And, although not typically the target of analysis, there is preliminary evidence of negative bivariate correlations between cognitive failures and Extraversion, Openness, and Agreeableness (Snitz et al., 2015).

The trait correlates of subjective cognition mirror the pattern of associations often found for measured cognitive performance. That is, Neuroticism and Conscientiousness tend to be associated with worse and better cognitive function, respectively (Curtis, Windsor, & Soubelet, 2015). For example, individuals higher in Neuroticism tend to remember fewer words in standard memory tasks, whereas individuals higher in Conscientiousness tend to remember more words (Luchetti, Terracciano, Stephan, & Sutin, 2016). Interestingly, however, cognitive failures tend to be unrelated to performance on cognitive tests (Könen & Karbach, 2018; Lange & Süß, 2014), although there is some evidence that there may be a negative correlation in older adulthood (Snitz et al., 2015). This pattern suggests that the cognitive failures associated with the traits are not just a reflection of cognitive ability that is also related to the traits. Rather, the relation between cognitive failures and personality may be due, in part, to processes inherent to the traits. Individuals higher in Conscientiousness, for example, tend to be very organized in their possessions (Gosling, Ko, Mannarelli, & Morris, 2002) and daily schedule (Sutin & Terracciano, 2016b), and this organization may extend to their memory, perception, and action. Individuals higher in Neuroticism, in contrast, tend to ruminate and are often distracted (Denovan, Dagnall, & Lofthouse, 2019), which may interfere with the cognitive processes in daily life that contributes to cognitive failures. Further, individuals higher in Extraversion tend to make more positive evaluations

of their lives (Soto, 2015), their relationships (Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010), and their health (Sutin & Terracciano, 2016a), a pattern that may extend to more positive evaluations of their cognitive failures (i.e., less frequent). And, in fact, higher Extraversion is associated with better perceptions of one's memory (Luchetti et al., 2016). In such a model, personality traits have independent associations with subjective cognition as well as objective cognitive function. That is, the relation between personality and cognitive failures is not dependent on cognitive abilities.

As described above, previous research on FFM personality traits and cognitive failures has focused primarily on Neuroticism. In addition to extending the association to other traits, it is also useful to examine more specific traits within the personality trait hierarchy and to specific domains of cognitive failures. Under the five broad personality domains, for example, there are more specific traits, referred to as facets, that can have greater predictive power than the overarching domain (Paunonen, Haddock, Forsterling, & Keinonen, 2003). In addition, the correlates of facets sometimes go in opposite directions, which obscures the association at the domain level (Sutin et al., 2011). Cognitive failures likewise can be domain-specific (Wallace, Kass, & Stanny, 2002). Although cognitive failures are usually aggregated across domains, there may be distinct correlates with different types of failures (e.g., blunders, failure of memory and/or names) (Wallace et al., 2002), including for personality (Könen & Karbach, 2018). Such distinctions are potentially lost when cognitive failures are simply aggregated together.

Depressive symptoms are also implicated in cognitive failures (Hohman, Beason-Held, & Resnick, 2011). It is perhaps not surprising that individuals with depressed affect may have difficulties with memory and attention. Depressive symptoms are likewise routinely associated with personality. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5), in fact, recognizes Neuroticism as a significant risk factor for major depression (American Psychiatric Association, 2013). Even at subclinical levels, individuals higher in Neuroticism are more prone to experience symptoms of depression (Kendler et al., 2018). Beyond Neuroticism, lower Extraversion and lower Conscientiousness are also related to more depressive symptoms (Hakulinen, Elovainio, et al., 2015). The relation between personality and cognitive failures may be due in whole or in part to the overlap of both constructs with depressed affect.

The present research examines the association between personality traits and self-reported cognitive failures in a relatively large sample that covers much of the adult lifespan. We test the hypotheses that higher Neuroticism is associated with more cognitive failures, whereas higher Extraversion and Conscientiousness are associated with fewer cognitive failures. We do not make a directional hypothesis for Openness or Agreeableness. These hypotheses are based on how the processes associated with the FFM traits reviewed above are theoretically related to cognitive failures: Neuroticism may be associated with more cognitive failures because of the rumination and distraction that is inherent to this trait (Denovan et al., 2019) and Conscientiousness and Extraversion may be associated with fewer cognitive failures because of the association with organization (Gosling et al., 2002) and tendency to view one's health positively (Sutin & Terracciano, 2016a), respectively. In addition to the five broad domains of personality and the aggregate of cognitive failures, we also examine two

facets of each trait identified by Soto and John (2009) and four domains of cognitive failures (memory, distractibility, blunders, and names) identified by Wallace and colleagues (2002). We further test whether these associations persist controlling for depressed affect and whether the associations vary by age.

Method

Participants and Procedure

Participants were recruited through Survey Sampling International's (SSI) proprietary panel to complete an online study on the psychological correlates of well-being and health. Participants had to be 18 years or older and living in the United States. The sampling was stratified by gender, age, and race such that gender was 50/50, there was roughly an equal percentage of participants (20%) in five age bands (18–29, 30–39, 40–49, 50–59, and 60+ years), and African Americans were oversampled relative to population estimates (~20%). SSI contacted participants and directed them to a Qualtrics survey. Of the total of 6,303 individuals who clicked on the link provided by SSI, 6,040 consented to participate and 5,133 completed the measures of personality and cognitive failures (81% participation rate).

Measures

Personality.—The 44-item Big Five Inventory (BFI) was used to measure personality traits (John, Naumann, & Soto, 2008). The BFI measures the five broad domains and two more circumscribed facets within each domain (Soto & John, 2009). Participants rated items that finished the sentence stem, “I see myself as someone who...” on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Eight items measured Neuroticism (e.g., can be moody; $\alpha = .85$), 8 items measured Extraversion (e.g., is talkative; $\alpha = .81$), 10 items measured Openness (e.g., has an active imagination; $\alpha = .78$), 9 items measured Agreeableness (e.g., is generally trusting; $\alpha = .79$), and 9 items measured Conscientiousness (e.g., is a reliable worker; $\alpha = .83$). The BFI also assesses two facets for each domain: anxiety and depression (Neuroticism), assertiveness and activity (Extraversion), aesthetics and ideas (Openness), altruism and compliance (Agreeableness), and order and self-discipline (Conscientiousness).

Cognitive failures.—Participants completed the 25-item Cognitive Failures Questionnaire (CFQ; Broadbent et al., 1982). Instructions for the scale were, “The following questions are about minor mistakes that everyone makes from time to time, but some of which happen more often than others. We want to know how often these things have happened to you in the past 6 months.” Participants rated items (e.g., “Do you read something and find you haven't been thinking about it and must read it again?”) from 1 (*never*) to 5 (*very often*). The total score was the mean of the 25 items ($\alpha = .96$). In addition to the total score, there were four subscales (Wallace et al., 2002): Memory (e.g., “Do you find that you forget appointments?”), Distractibility (e.g., “Do you read something and find that you haven't been thinking about it and must read it again?”), Blunders (e.g., “Do you bump into people?”) and Names (e.g., “Do you find that you forget people's names?”).

Depressed affect.—Depressed affect was measured with two items from the Patient Health Questionnaire (Spitzer, Kroenke, & Williams, 1999): Over the last two weeks, how often have you been bothered by any of the following problems: “Little interest or pleasure in doing things?” and “Feeling down, depressed, or hopeless?” Participants rated each item on a scale from 1 (*not at all*) to 4 (*nearly everyday*). The mean was taken across the two items ($\alpha=.85$) as a measure of state depressed affect (Kroenke, Spitzer, & Williams, 2003).

Covariates.—Covariates included in all analyses were self-reported age in years, gender (0=male, 1=female), education (on a scale from 1=less than high school to 6=professional degree), and race (four dummy-coded variables were 1=African American, 1=Asian, 1=Multiracial, 1=Other or unknown all compared to 0=white).

Statistical Approach

Linear regression was used to test the association between the traits (domains, facets) and the total CFQ as well as the four subscales, controlling for the covariates. We reran the analyses including depressed affect as an additional predictor to determine whether the shared overlap accounted for the association between personality and cognitive failures. Finally, we tested an interaction between each domain and age to examine whether the associations were moderated by age.

Results

Descriptive statistics for the study variables are shown in Table 1 and the bivariate correlations among all study variables are in Table 2. Table 3 shows the relations between personality and cognitive failures and Supplementary Table 1 reports the variance explained (adjusted R^2) for each model. At the domain level, Neuroticism and Conscientiousness had the strongest associations with the CFQ: Participants higher in Neuroticism reported more cognitive failures overall and more failures in each of the domains, and participants higher in Conscientiousness reported fewer failures overall and fewer failures in each domain. Higher Agreeableness and Extraversion, and to a lesser extent Openness, were associated with fewer cognitive failures.

Consistent with the literature on depressive symptoms and subjective cognition (e.g., Hohman et al., 2011), depressed affect was likewise associated with more cognitive failures (Table 3). When controlling for depressed affect, the pattern of associations was similar for Neuroticism, Agreeableness, and Conscientiousness but the strength of these associations was reduced by roughly 50%. Depressed affect further attenuated the association between Openness and cognitive failures to non-significance. Likewise, the associations between Extraversion and overall cognitive failures as well as Memory and Blunders reduced to non-significance when accounting for depressed affect. The association with Distractibility and Names remained significant but about half the size of the relation without controlling for it.

Table 3 also shows the relation between the two facets of each trait and cognitive failures. Overall, the pattern for each of the facets was similar to the pattern for the corresponding domain. There were some additional patterns worth noting. First, the Anxiety and

Depression facets of Neuroticism were both associated with cognitive failures, even after accounting for state depressed affect. Compared to Anxiety, Depression had stronger associations with the Memory and Blunder subscales. Second, both Order and Self-Discipline were associated negatively with cognitive failures, but the associations with Order were stronger. Third, the Compliance facet of Agreeableness likewise had stronger associations with cognitive failures than the Altruism facet. Finally, the associations for the two facets of Extraversion were similar in the first analysis. Divergent patterns emerged when controlling for depressed affect. Although Assertiveness was associated weakly with the total score for the CFQ, there were differences across the CFQ subscales, with negative associations for Distractibility and Names and no relation for Memory and Blunders. Activity, in contrast, was unrelated to the total CFQ score and Distractibility and Blunders, but the association was in opposite directions for Memory and Names. The negative association between Activity and Names was expected. There was, however, a suppressor effect for Memory: the inclusion of depressed affect as an additional covariate changed the sign of the coefficient to positive for the relation between Activity and Memory failures.

Finally, the interaction analysis indicated that the associations varied by age: the association between Neuroticism ($\beta = -.10, p < .01$), Agreeableness ($\beta = .08, p < .01$), and Conscientiousness ($\beta = .07, p < .01$) and the total CFQ score was stronger at relatively younger ages than older ages, whereas the opposite pattern emerged for Extraversion ($\beta = -.04, p < .01$) and Openness ($\beta = -.04, p < .01$). It is important to note, however, that in every case the association was still apparent at the other end of the age spectrum. These interactions, however, should also be interpreted with caution until replicated in an independent sample.

Discussion

The present research indicates that all five personality traits are associated with cognitive failures in models that accounted for sociodemographic characteristics. Depressed affect was likewise associated with more cognitive failures. Further, the associations between Neuroticism, Agreeableness, Conscientiousness and cognitive failures were not accounted for by depressed affect: Individuals higher in Neuroticism or lower in Agreeableness or Conscientiousness tended to report more lapses in memory, perception, and action even after controlling for depressed affect. These associations are broadly consistent with the emerging literature on personality and cognitive failures (Könen & Karbach, 2018) and subjective cognition more generally (Koller et al., 2019). The current study builds on this foundation by using a sample that covered nearly the entire adult lifespan from 18 to 91 and facets of both personality and cognitive failures. The large sample also provided sufficient power to detect differences in associations across age. And, indeed, the associations are seen across adulthood, with some trait correlates stronger in younger (Neuroticism, Agreeableness, Conscientiousness) or older (Extraversion, Openness) adulthood.

Lifespan models of personality and health theorize the pathways through which FFM personality traits contribute to health outcomes, such as longevity (Friedman, Kern, Hampson, & Duckworth, 2014). These models have been applied to objective cognitive outcomes to identify mechanisms that link personality traits to cognition (Luchetti et al., 2016). The same theorized mechanisms that contribute to the association between

personality and cognitive performance may also contribute to the association with cognitive failures. Personality, for example, is associated with physical inactivity (Sutin et al., 2016), smoking (Hakulinen, Hintsanen, et al., 2015), diabetes (Jokela et al., 2014), hypertension (Cheng, Montgomery, Treglown, & Furnham, 2017), body mass index (Sutin et al., 2018), and educational achievement (Sutin, Luchetti, Stephan, Robins, & Terracciano, 2017). These factors are associated with cognitive functioning (Sabia et al., 2009) and are recognized as major modifiable risk factors for Alzheimer's disease (Norton, Matthews, Barnes, Yaffe, & Brayne, 2014). There may also be other pathways, such as through inflammation (Darweesh et al., 2018) and engagement in cognitively-stimulating activities (Stine-Morrow et al., 2014), that have been implicated in objective cognition that could extend to the relation between personality and cognitive failures.

An alternative, non-mutually exclusive explanation is that cognitive failures may be one expression of the processes associated with the traits. Five Factor Theory, for example, indicates that the characteristics adaptations associated with the traits contribute to the expression and outcomes associated with the traits (McCrae & Costa, 2003). People high in Conscientiousness, for example, tend to be very organized in their possessions (Gosling et al., 2002) and schedules (Sutin & Terracciano, 2016b). The present research suggests that their cognition is also perceived to be organized. That is, individuals higher in Conscientiousness are able to pay attention and thus have fewer failures of distraction and blunders. Indeed, the order facet of Conscientiousness had significantly stronger associations with cognitive failures than the self-discipline facet. Individuals who describe themselves as organized have fewer difficulties with remembering things and people, are less distracted, and make fewer blunders. This behavioral pattern may result from their capacity for organization. On the other end of the continuum, cognitive failures may be one mechanism through which individuals lower in Conscientiousness are unreliable and not able to finish tasks.

Individuals high in Neuroticism tend to be preoccupied with mistakes (Smith et al., 2019) and prone to being overly critical of themselves and their cognitive abilities (Colvin, Malgaroli, Chapman, MacKay-Brandt, & Cosentino, 2018). With retrospective measures it is impossible to tease apart actual cognitive failures from negative reporting biases. Evidence from ambulatory studies, however, suggests that the association with Neuroticism is not due entirely to bias. That is, Neuroticism has similar associations with retrospective and real-time assessments of cognitive failures over one week (Lange & Süß, 2014). Ambulatory studies also indicate that the association between Neuroticism and worse objective daily cognitive function is mediated by greater frequency of intrusive thoughts (Munoz, Sliwinski, Smyth, Almeida, & King, 2013). Individuals higher in Neuroticism may also have more cognitive failures due in part to this tendency toward rumination that disrupts their ability to regulate themselves.

The associations for the other three traits were somewhat surprising. We had expected Extraversion to be associated with fewer cognitive failures because individuals higher in Extraversion tend to make more positive evaluations of their lives in general (Soto, 2015) and their cognitive abilities in particular (Colvin et al., 2018). Although Extraversion did have a negative association with cognitive failures, this association was due largely to the

overlap with depressed affect at the introversion pole of the trait. Of note, Extraversion was associated with less distractibility and less difficulty remembering names even after accounting for depressed affect. These associations may be due, in part, to the association between Extraversion and better attentional focus (Hahn, Buttaccio, Hahn, & Lee, 2015) and the social nature of the trait (Ashton, Lee, & Paunonen, 2002). The sociability of those higher in Extraversion may manifest as ease at remembering names. Perhaps most surprising, however, was the negative association between Agreeableness and cognitive failures: Individuals higher in the general tendency to be empathetic, trusting, and straightforward reported fewer momentary lapses in cognition. At the facet level, the associations were stronger for the compliance component of this trait. Individuals who score lower in compliance are less forgiving and more aggressive than individuals who score higher in this facet. This belligerent and antagonistic disposition may interfere with the ability to follow through on cognitive actions. Finally, we did not make a directional hypothesis for Openness; it was unrelated to cognitive failures.

Consistent with previous research (Hohman et al., 2011), depressed affect was associated with more cognitive failures. This association may be due, in part, to cognitive failures as one expression of depression (Trivedi & Greer, 2014). That is, distortions in thinking are one criteria for depression (American Psychiatric Association, 2013), and cognitive failures, such as forgetting names or getting distracted, may be one symptom. Of note, common measures of depressive symptoms include items related to difficulty with concentrating and other thought disturbances that are likely to be closely related to cognitive failures. In the current research, two depressed affect items were used, and those were nonetheless associated with cognitive failures. Our findings support the notion that individuals who experience depressed affect also experience cognitive symptoms.

In the present research, depressed affect accounted for about half of the association between personality and cognitive failures. Of note, however, most of the associations remained significant after controlling for depressed affect. This pattern is particularly of note for the depression facet of Neuroticism. A trait disposition toward depression still had moderately strong associations with cognitive failures even after controlling for acute symptomatology. In contrast, depressed affect did account for some of the association between Extraversion and cognitive failures. There was suppressor effect for the activity facet on cognitive failures of memory: After removing the shared variance due to depressed affect, higher activity was associated with reported greater, rather than lower, frequency of memory failures. Interestingly, there is some evidence from performance on verbal fluency tasks that the activity facet is associated with both better performance but also with repeating the same words, which can be due to failure of memory (Sutin et al., 2011).

The relation between cognitive failures and age is not yet clear. On the one hand, aging may be linked to increases in only certain types of cognitive failure (Rast, Zimprich, Van Boxtel, & Jolles, 2009). On the other hand, recent work suggests that cognitive failures tend to be unrelated to age (Könen & Karbach, 2018), with some counterintuitive evidence that scores on common measures of cognitive failures decline with age (Mecacci & Righi, 2006). This evidence is consistent with the idea that cognitive failures are not a direct reflection of cognitive capacity, which tends to decline with age. Most studies of personality and

cognitive failures have focused on specific age groups (e.g., younger adults or older adults), which do not allow for addressing whether associations vary by age. The present research suggests that the associations between personality and cognitive failures are apparent across adulthood, but some associations are stronger in early or later adulthood. In particular, the associations for Neuroticism and Conscientiousness tended to be stronger at younger ages. At younger ages, the cognitive failures associated with these traits' processes may be more observable than at older ages, when cognitive failures may become more the norm.

Subjective cognition may be both an outcome and as a mechanism of cognitive health. Although cognitive failures in particular tend to be unrelated to measured cognitive performance (Carrigan & Barkus, 2016), they are associated with subsequent cognitive decline (Hohman et al., 2011) and amyloid burden (Amariglio et al., 2012). This pattern suggests that subjective cognition, particularly cognitive failures, may be an early marker of impairment that is not detected with traditional cognitive testing because individuals are often able to compensate for emerging deficits on such tests (Jessen et al., 2014). Although subjective cognition may be a mechanism for cognitive decline, it does not appear to mediate the relation between Neuroticism and cognitive performance over time (Aschwanden et al., 2018). This pattern suggests that cognitive failures may not be a mechanism that links personality to objective cognitive performance in healthy adults but could potentially mediate the prospective association between personality and risk of incident cognitive impairment. More research in this area is necessary to better understand the dynamics between personality, cognitive failures, and objective cognitive outcomes.

The present research had several strengths. We examined the association between personality and cognitive failures in a large sample that ranged from younger to older adulthood. This approach allowed us to look at how personality and cognitive failures are associated across adulthood with sufficient power to detect potential interactions. We also used well-validated measures of personality and cognitive failures. These measures have hierarchical structures and allowed us to examine the relation between personality and cognitive failures at a deeper level by examining facets of each construct. Third, we considered the role of depressed affect, which is often neglected in work on personality and cognitive failures. It also contributes to theoretical accounts of personality and cognition. Subjective cognition is distinct from objective cognition, particularly with regards to dementia risk (Jessen et al., 2014). Subjective cognition may partly explain the association between personality and dementia. As a first step, this study provides a robust test of whether personality traits are associated with cognitive failures and adds to our understanding of the pathways linking personality to an important life outcome, dementia. That is, cognitive failures might capture deficits in everyday cognition that are different from those measured by cognitive tasks and are likely to be relevant on the pathway between personality and cognitive impairment.

There are also some limitations that could be addressed in future research. The data, for example, are cross-sectional. Given the changes in personality over time (Terracciano, McCrae, Brant, & Costa, 2005), it would be worthwhile to collect longitudinal data in future work. With such data it would be possible to address potential reciprocal relations between personality and cognitive failures in a longitudinal framework. In addition, since the

cognitive failure measure was retrospective, the processes associated with the traits may have been driving how individuals reported on the failures. Ambulatory measures of cognitive failures support the validity of the retrospective measures and also suggest that such measures reflect more than simply personality (Lange & Süß, 2014). Still, more work that includes both ambulatory measures and ratings by a knowledgeable informant would provide additional support for the relation between personality and cognitive failures. Although we used a well-validated measure of personality, it included only two facets per domain (Soto & John, 2009). It would be worthwhile in future research to use a more comprehensive scale that measures six facets per domain. Finally, we did not measure the hypothesized mechanisms (e.g., cardiovascular factors, perceived stress) that may contribute to the relation between traits and cognitive failures. Future research could empirically test this pathway. Despite these limitations, the present research advances the current literature by showing a pattern of associations between the five traits and four types of cognitive failures, that these associations are generally in addition to depressed affect, and that although the strength of the association may vary as a function of age, it emerges at least as early as young adulthood and is apparent through older adulthood.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Descriptive Statistics for All Study Variables

Variable	Mean (SD) or %
Age (years)	44.63 (15.26)
Sex (female)	50%
Race (white)	71%
Race (African American)	20%
Race (Asian)	4%
Race (Multiracial)	3%
Race (Other or unknown)	2%
Education ^a	3.54 (1.28)
Depressed Affect ^b	1.74 (.88)
Personality ^c	
Neuroticism	2.75 (.82)
Anxiety	2.70 (.89)
Depression	2.79 (1.06)
Extraversion	3.15 (.74)
Assertiveness	2.94 (.82)
Activity	3.49 (.93)
Openness	3.54 (.60)
Aesthetics	3.34 (.81)
Ideas	3.57 (.62)
Agreeableness	3.80 (.65)
Altruism	3.87 (.69)
Compliance	3.71 (.81)
Conscientiousness	3.82 (.69)
Order	3.46 (1.08)
Self-discipline	3.82 (.72)
Cognitive Failures ^d	2.28 (.80)
Memory	2.03 (.88)
Distractibility	2.44 (.83)
Blunders	2.20 (.84)
Names	2.69 (1.07)

N=5,133.

^aReported on a scale with response options of 1 (Less than high school; 4%), 2 (High school graduate; 20%), 3 (Some college or associate's degree; 26%), 4 (Bachelor's degree; 26%), 5 (Master's degree; 17%), and 6 (Professional degree; 7%).

^bRated on a scale from 1 (Not at all) to 4 (Nearly everyday).

^cRated on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

^dRated on a scale from 1 (Never) to 5 (Very Often).

Table 2

Correlations among all study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age	--													
2. Sex	.00	--												
3. Race (African American)	-.13*	-.11*	--											
4. Race (Asian)	-.11*	-.02	-.11*	--										
5. Race (Multicultural)	-.07*	.02	-.09*	-.04*	--									
6. Race (other/unknown)	-.02	-.03	-.08*	-.03	-.03	--								
7. Education	.07*	-.07*	-.11*	.10*	.02	.00	--							
8. Depressed Affect	-.26*	-.01	.06*	.01	.04*	.02	-.10*	--						
9. Cognitive Failures	-.24*	.02	.01	.02	.03	.02	-.05*	.61*	--					
10. Memory	-.24*	-.02	.04*	.04*	.02	.03	-.04*	.58*	.95*	--				
11. Distractibility	-.22*	.08*	.00	.01	.04*	.02	-.06*	.59*	.96*	.87*	--			
12. Blunders	-.27*	-.01	.01	.03	.03	.02	-.05*	.59*	.95*	.88*	.86*	--		
13. Names	-.01	-.02	-.05*	.00	.03	.00	.02	.37*	.72*	.61*	.68*	.61*	--	
14. Neuroticism	-.23*	.14*	-.07*	.00	.05*	-.01	-.13*	.56*	.48*	.42*	.49*	.48*	.31*	--
15. Extraversion	.07*	.00	.02	-.02	-.03	.02	.10*	-.25*	-.17*	-.11*	-.21*	-.14*	-.19*	-.40*
16. Openness	.00	-.02	.04*	-.03	.06*	.02	.17*	-.08*	-.06*	-.06*	-.05*	-.04*	-.06*	-.20*
17. Agreeableness	.26*	.13*	.01	-.07*	-.02	-.01	-.02	-.33*	-.35*	-.35*	-.28*	-.40*	-.21*	-.46*
18. Conscientiousness	.31*	.09*	-.01	-.06*	-.04*	-.02	.10*	-.43*	-.47*	-.47*	-.43*	-.48*	-.25*	-.51*
19. N: Anxiety	-.20*	.17*	-.10*	.01	.03	-.02	-.14*	.45*	.40*	.34*	.42*	.39*	.26*	.93*
20. N: Depression	-.24*	.04*	-.01	-.01	.04*	.00	-.10*	.61*	.51*	.46*	.50*	.51*	.31*	.82*
21. E: Assertiveness	.10*	.02	-.03	-.04*	-.03	.02	.05*	-.21*	-.17*	-.13*	-.20*	-.13*	-.16*	-.29*
22. E: Activity	-.05*	-.05*	.10*	.02	-.02	.03	.15*	-.23*	-.12*	-.06*	-.15*	-.10*	-.17*	-.43*
23. O: Aesthetics	-.02	.05*	.02	-.01	.05*	.01	.14*	-.08*	-.07*	-.06*	-.06*	-.06*	-.10*	-.13*
24. O: Ideas	.03	-.06*	.04*	-.04*	.05*	.02	.18*	-.10*	-.06*	-.08*	-.06*	-.05*	-.04*	-.23*
25. A: Altruism	.19*	.13*	.00	-.06*	-.02	-.01	-.02	-.23*	-.23*	-.23*	-.18*	-.26*	-.14*	-.35*
26. A: Compliance	.26*	.10*	.02	-.06*	-.01	.00	-.03	-.33*	-.35*	-.36*	-.29*	-.40*	-.20*	-.43*
27. C: Order	.26*	.09*	-.02	-.06*	-.03	-.02	.02	-.40*	-.50*	-.49*	-.46*	-.50*	-.27*	-.40*

28. C: Self-discipline	.31*	.07*	.00	-.06	-.05*	-.02	.12*	-.42*	-.44*	-.44*	-.42*	-.44*	-.24*	-.50*
	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.
15. Extraversion	--													
16. Openness	.37*	--												
17. Agreeableness	.24*	.25*	--											
18. Conscientiousness	.30*	.31*	.57*	--										
19. N: Anxiety	-.41*	-.25*	-.38*	-.47*	--									
20. N: Depression	-.29*	-.06*	-.45*	-.45*	.60*	--								
21. E: Assertiveness	.92*	.21*	.14*	.21*	-.29*	-.25*	--							
22. E: Activity	.69*	.49*	.28*	.34*	-.44*	-.27*	.38*	--						
23. O: Aesthetics	.22*	.78*	.18*	.20*	-.15*	-.04*	.12*	.30*	--					
24. O: Ideas	.38*	.90*	.24*	.31*	-.27*	-.09*	.24*	.49*	.48*	--				
25. A: Altruism	.29*	.28*	.88*	.49*	-.30*	-.31*	.17*	.35*	.18*	.26*	--			
26. A: Compliance	.10*	.15*	.85*	.45*	-.34*	-.44*	.06*	.11*	.12*	.15*	.56*	--		
27. C: Order	.12*	.03	.40*	.78*	-.32*	-.45*	.14*	.06*	.06*	.04*	.28*	.38*	--	
28. C: Self-discipline	.33*	.34*	.55*	.95*	-.48*	-.44*	.22*	.39*	.21*	.34*	.48*	.43*	.60*	--

Note. $N=5,133$.

Table 3

Associations Between Personality Domains and Facets and Cognitive Failures

Personality	CFQ Total	CFQ Subscales			
		Memory	Distractibility	Blunders	Names
Domains					
Neuroticism	.46 [*] /.20 [*]	.40 [*] /.14 [*]	.46 [*] /.22 [*]	.45 [*] /.21 [*]	.33 [*] /.16 [*]
Extraversion	-.15 [*] /-.02	-.10 [*] /.03	-.19 [*] /-.07 [*]	-.12 ^{**} /.01	-.19 [*] /-.10 [*]
Openness	-.05 [*] /-.01	-.06 [*] /-.02	-.04 [*] /.00	-.04 [*] /.00	-.06 [*] /-.03
Agreeableness	-.32 [*] /-.16 [*]	-.32 [*] /-.16 [*]	-.26 [*] /-.10 [*]	-.36 [*] /-.22 [*]	-.22 [*] /-.11 [*]
Conscientiousness	-.45 [*] /-.26 [*]	-.45 [*] /-.27 [*]	-.42 [*] /-.23 [*]	-.44 [*] /-.26 [*]	-.27 [*] /-.14 [*]
Depressed Affect	.59 [*]	.56 [*]	.57 [*]	.56 [*]	.40 [*]
Facets					
N: Anxiety	.38 [*] /.16 [*]	.32 ^{*a} /.10 ^{*a}	.39 [*] /.18 [*]	.36 ^{*a} /.15 ^{*a}	.28 [*] /.13 [*]
N: Depression	.49 [*] /.22 [*]	.44 ^{*a} /.17 ^{*a}	.48 [*] /.22 [*]	.48 ^{*a} /.24 ^{*a}	.33 [*] /.15 [*]
E: Assertiveness	-.15 [*] /-.04 [*]	-.10 [*] /.00	-.18 [*] /-.08 [*]	-.11 [*] /.00	-.16 [*] /-.09 [*]
E: Activity	-.13 [*] /.02	-.07 [*] /.07 [*]	-.15 [*] /-.02	-.11 [*] /.03	-.17 [*] /-.08 [*]
O: Aesthetics	-.07 [*] /-.03 [*]	-.06 [*] /-.02	-.06 [*] /-.02	-.06 [*] /-.03	-.10 [*] /-.07 [*]
O: Ideas	-.05 [*] /.00	-.07 [*] /-.02	-.04 [*] /.01	-.04 [*] /.01	-.04 [*] /-.01
A: Altruism	-.19 ^{*a} /-.08 ^{*a}	-.19 ^{*a} /-.09 ^{*a}	-.16 ^{*a} /-.05 ^{*a}	-.22 ^{*a} /-.12 ^{*a}	-.14 ^{*a} /-.07 ^{*a}
A: Compliance	-.32 ^{*a} /-.17 ^{*a}	-.32 ^{*a} /-.17 ^{*a}	-.27 ^{*a} /-.11 ^{*a}	-.36 ^{*a} /-.22 ^{*a}	-.21 ^{*a} /-.11 ^{*a}
C: Order	-.47 ^{*a} /-.30 ^{*a}	-.46 ^{*a} /-.30 ^{*a}	-.44 ^{*a} /-.27 ^{*a}	-.46 ^{*a} /-.30 ^{*a}	-.29 ^{*a} /-.17 ^{*a}
C: Self-Discipline	-.42 ^{*a} /-.23 ^{*a}	-.40 ^{*a} /-.23 ^{*a}	-.40 ^{*a} /-.21 ^{*a}	-.40 ^{*a} /-.22 ^{*a}	-.27 ^{*a} /-.14 ^{*a}

Note. $N=5,133$. Coefficients are standardized beta coefficients controlling for age, sex, race, and education. Coefficients after the slash (“/”) additionally control for depressed affect. The depressed affect coefficients control for the sociodemographic characteristics but not personality. CFQ=Cognitive Failures Questionnaire. N=Neuroticism. E=Extraversion. O=Openness. A=Agreeableness. C=Conscientiousness.

* $p<.01$;

^a Significant difference between the facets within the trait domain (Z difference $p<.05$).