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Fluid Cognitive Ability is associated with Greater Exposure and Smaller Emotional Reactions to Daily Stressors

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Abstract

This study examined whether fluid cognitive ability predicts exposure and emotional reactivity to daily stressors. A national sample of adults from Midlife in the United States (MIDUS) study and the National Study of Daily Experiences (N = 1,202) with a mean age of 57 (SD = 12, 56% female) completed positive and negative mood reports, as well as a stressor diary on 8 consecutive evenings via telephone. Participants also completed a telephone-based battery of tests measuring fluid cognitive ability. Higher levels of fluid cognitive ability were associated with greater exposure to work- and home-related overload stressors. Possessing higher levels of fluid cognitive ability was associated with smaller stressor-related increases in negative mood, primarily for interpersonal tensions and network stressors, and smaller stressor-related decreases in positive mood for interpersonal tensions. Furthermore, fluid cognitive ability was unrelated to subjective severity ratings of the stressors reported. Discussion focuses on the role of fluid cognitive ability in daily stress processes.

Keywords

Daily Stress; Fluid Cognitive Ability; Positive and Negative Mood

Daily stressors are minor events that arise out of day-to-day living that have the potential to affect physical and psychological well-being, such as an argument or a work deadline

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(Almeida, 2005). Although these events are relatively minor, they have a more proximal effect on well-being than major life events such as job loss and divorce, and their cumulative effects are thought to have deleterious consequences for long-term health and well-being (Lazarus, 1999; Zautra, 2003). Daily stress research focuses on identifying factors associated with what is collectively known as the daily stress process, specifically exposure and reactivity to such events. Exposure refers to the likelihood of experiencing a stressor, while reactivity is a change in either emotional or physical well-being associated with the experience of a stressor (Almeida 2005; Bolger & Zuckerman, 1995). Previous research has shown that numerous sociodemographic and personality factors are associated with exposure and emotional reactivity to daily stressors, however, fluid cognitive ability, the ability to process and integrate information, act, and solve novel problems, has not been considered as a resilience/ vulnerability factor related to the daily stress process. Such ability might be predictive of whether individuals experience daily stressors, the types of stressors they experience, how they appraise such stressors, and how they react emotionally to such stressors. Using data from the National Study of Daily Experiences (NSDE), the current study examines whether individual differences in fluid cognitive ability are associated with exposure to daily stressors, subjective severity ratings of daily stressors, and emotional reactivity to daily stressors.

Recently, a number of researchers have argued that daily diary designs can help researchers understand individuals and the environments in which they live (Almeida, 2005; Bolger, Davis, & Rafaeli, 2003; Tennen, Affleck, Armeli, & Carney, 2000). Furthermore, such designs are amenable to a process-oriented approach to understanding stressors that occur and how individuals respond and react to such stressors. That is, daily diary approaches permit the examination of within-person associations between stressors and measures of daily well-being such as physical health and emotions (Almeida, 2005; Bolger et al., 2003; Tennen, et al., 2000). These designs also allow for the testing of individual differences in stressor exposure and emotional reactivity. Over a decade ago, Bolger and Zuckerman (1995) presented a framework for studying individual differences in personality in the daily stress process. Within this framework individual differences in exposure and emotional reactivity to daily stressors can be considered in concert to determine whether individual differences in personality (or any other potentially important characteristic) are associated with the likelihood of experiencing stressors (differential exposure model), experiencing changes in emotion once the stressor occurred (differential reactivity model), both exposure and emotional reactivity (differential exposure-reactivity model), or neither (null model). This framework has since served as a basis for which researchers interested in the daily stress process have systematically approached the study of resilience and vulnerability factors related to daily stressor exposure and emotional reactivity (Almeida, 2005; Zautra, 2003).

Drawing on the framework presented by Bolger and Zuckerman (1995), previous research has identified numerous factors associated with exposure and emotional reactivity to daily stressors. Exposure to fewer daily stressors has been found among individuals who are older (Almeida & Horn, 2004; Chiriboga, 1997; Folkman, Lazarus, Pimley, & Novacek, 1987; Zautra, Finch, Reich, & Guarnaccia, 1991), male (Almeida & Kessler, 1998; Folkman et al., 1987), less educated (Grzywacz, Almeida, Neupert & Ettner, 2004), and less neurotic (Bolger & Zuckerman, 1995). Greater emotional reactivity to daily stressors has been found among individuals who are older (Mroczek & Almeida, 2004), female (Bolger, Delongis, Kessler, & Schilling, 1989), less educated (Almeida, Neupert, Banks, & Serido, 2005; Grzywacz et al., 2004), more neurotic (Bolger & Schilling, 1991; Bolger & Zuckerman, 1995; Mroczek & Almeida, 2004), and report higher levels of perceived stress (Stawski, Sliwinski, Almeida, & Smyth, 2008). A notable exception to this list of resilience/vulnerability factors is that cognitive ability has not been considered as a predictor of individual differences in exposure and reactivity to daily stressors.

Fluid cognitive ability (FCA) reflects an individual's capacity to process and integrate information, act, and solve novel problems, and is related to general intelligence (Baltes, Staudinger & Lindenberger, 1999; Carroll, 1993, Horn & Cattell, 1967; Horn & Hofer 1992). Moreover, such ability is thought to be highly useful when tasks and situations are novel and complex, such as situations which are potentially stressful or require adaptation (e.g., Gotfredson & Deary, 2004). Possessing FCA has been shown to play an important role in health and well-being throughout adulthood and into old age. Previous research has shown that fluid cognitive ability is associated with numerous psychological and health outcomes including better psychological well-being (Isaacowitz & Smith, 2003), greater perceived control (Lachman & Leff, 1989), decreased likelihood of hospitalization (Chodosh et al., 2004), better health and longevity (Gottfredson & Deary, 2004), lower levels of disablement (Smits, Deeg, & Jonker, 1997), and lower mortality (Bosworth & Siegler, 2002; Deary, Whiteman, Starr, Whalley, & Fox, 2004). The observed link between FCA and psychological and health outcomes has led some to hypothesize that FCA may help buffer against negative health outcomes, as it is useful in the accommodation and navigation through of contexts where tasks and situations are novel and complex (Gottfredson & Deary, 2004). Accordingly, FCA may play an integral role in how people live their daily lives, in particular, the extent to which they experience daily stressors and how they react emotionally to such stressors. If, as Gottfredson and Deary (2004) contend, possessing higher levels of FCA protects against negative psychological and health outcomes, then they might also protect against exposure and reactivity to daily stressors as these higher functioning individuals may be better at both avoiding daily stressors, and minimizing their emotional reactions when daily stressors do occur. As such, possessing the ability to identify and adapt to novel situations that are potentially detrimental to one's health would be exhibited in lessened exposure and smaller emotional reactions to stressors in everyday life.

Drawing on the framework for examining individual difference factors associated with daily stress processes (Bolger & Zuckerman, 1995), FCA could be implicated in the daily stress process in one of four ways. FCA could be associated with exposure but not reactivity (differential exposure model), reactivity but not exposure (differential reactivity model), exposure and reactivity (differential exposure-reactivity model), or neither (null model). Individuals with higher levels of FCA may be better at recognizing potentially stressful events and avoiding them, and be more effective at tempering their emotional reactions to the stressors they experience. Such findings would be consistent with Gottfredson and Deary's (2004) perspective on the link between FCA and health outcomes.

Considering whether individual differences in FCA are associated with exposure and emotional reactivity to daily stressors may be a naive treatment of the issue. While the day is the primary unit of analysis in daily diary-type stress research, which might lead to the treatment of daily stressors as a dichotomous variable (i.e., stressor day vs. non-stressor day), some research has suggested that not all stressor days are equal, with some days characterized by more stressors than other days (Stawski et al., 2008). Therefore, in addition to considering whether FCA are associated with daily stressor exposure, one can test whether individual differences in FCA are associated with the number of stressors reported across stressor days. Such an approach can help further contextualize the daily experiences of people as a function of their level of FCA.

Another important consideration in daily stress research is that not all stressors are the same. Measures such as the Daily Inventory of Stressful Experiences (DISE: Almeida, Wethington, & Kessler, 2002) were designed to capture and reflect the gamut of stressors people typically experience in their daily lives. Based on previous diary-based stress research, a number of primary stressor types have been identified (Almeida & Horn, 2004; Almeida & Kessler, 1998; Bolger et al., 1991). First, interpersonal tensions are arguments or avoided arguments the respondent experienced involving other individuals. Second, overload stressors are stressors entailing having too much to do and not enough time or resources to accommodate these responsibilities, separately for both work and home. Finally, network stressors are events that happened to someone in the respondent's social network that turned out to be stressful for the respondent themselves, thus the respondent was not directly involved in the event. Almeida and Horn (2004) showed that age and gender differences in stressor exposure depended on the type of stressor being considered (i.e., interpersonal tension, overload, and network). Although general trends emerged such that older adults reported experiencing all three stressors less frequently than did younger adults, as did males compared to females, the magnitude of these differences was not equivalent suggesting that resilience and vulnerability factors related to stressor exposure may not be invariant across event type.

Similar patterns emerge for event-based differences in emotional reactivity to daily stressors. Bolger et al. (1991) found significant gender differences in emotional reactivity to stressors with women being more reactive to interpersonal tensions with a spouse or other people than were men, whereas men were more emotionally reactive to financial problems than were women. Similarly, Almeida and Kessler (1998) observed a greater likelihood of distress among males for work overloads, arguments with children, and financial problems. It is important to note that in these two studies the gender differences in emotional reactivity were not observed across all types of stressors. That is, the role of gender as a resilience/vulnerability factor depended on the type of stressor being considered. We are unaware of other studies which have considered the role of resilience/vulnerability factors in exposure and reactivity to daily stressors across different types of events, however, the pattern of results from the studies by Bolger and Almeida certainly suggest that a more nuanced consideration of factors related to exposure and emotional reactivity across specific event types is warranted. Thus, for the current study, it is of interest to examine associations between individual differences in FCA and exposure and emotional reactivity to daily stressors, considering whether associations emerge regardless of stressors types or are specific to a certain few.

Another aspect of daily stress research which is not often examined is predictors of subjective appraisals of the stressors people experience, such as the severity of the event. The collection of subjective appraisals about daily stressors represents another way of helping to understand the events people experience. Almeida and Horn (2004) reported that, on average, women subjectively rate their stressors as more severe than do men, as do younger adults compared to older adults. Birditt, Fingerman, and Almeida (2005) also reported a similar pattern of differences in severity ratings for stressors identified as interpersonal tensions. Together, there is evidence suggesting that there are significant individual differences in subjective severity reports of the daily stressors that people experience. As such, FCA may be an important individual difference characteristic related to how people appraise the severity of the stressors that they experience. People who possess lower levels of FCA may subjectively assess their stressors to be more severe as they are not able to adapt to the situation as efficiently as their counterparts with higher levels of FCA. Thus, considering associations between individual differences in FCA and daily stressor severity ratings can provide added dimensionality to the types of stressors people report.

Another goal of this study is to explore age and gender differences in the effects of FCA on exposure and emotional reactivity to daily stressors. Previous research has shown that increasing age is associated with decreased exposure to daily stressors (Almeida & Horn, 2004; Stawski et al., 2008), while results regarding age differences in emotional reactivity to daily stressors have been mixed with some evidence indicating that, compared to younger adults, older adults are more reactive (Mroczek & Almeida, 2004), less reactive (Uchino, Berg, Smith, Pearce & Skinner, 2006), or exhibit comparable reactivity (Stawski et al., 2008). Given the potential for enhanced vulnerability to the effects of daily stressors in old age, it is important to know whether positive aspects of FCA, might have a complementary positive effect, providing added protection against the effects of daily stressors during old age. Although FCA is typically shown to decline with advancing age (Salthouse, 2004; Schaie, 2005), possessing higher levels of FCA in advanced age may provide added protection against exposure and reactivity to daily stress. Thus, it is important to consider whether any protective effects are potentially enhanced during old age. If FCA can buffer against exposure and reactivity to daily stressors, but FCA decreases with advancing age, then possessing higher levels of FCA during old age could be particularly beneficial for buffering against exposure and emotional reactivity to daily stressors. Such a pattern of results indicates that preserved cognitive health into old age provides a preferential benefit for buffering against stress processes, and be consistent with successful aging (Rowe & Kahn, 1987Rowe & Kahn, 1997).

The Current Study

The current study uses a daily diary design to examine associations between individual differences in FCA and the daily stress process in a national sample of older adults. These adults completed a phone-based battery of cognition tasks (Lachman & Tun, 2008; Tun & Lachman, 2006), and 3–6 months later completed phone-based daily event diaries assessing their experience of interpersonal tensions, overload stressors, and network stressors, and measures of positive and negative mood on eight consecutive evenings. Drawing on the conceptual framework advanced by Bolger and Zuckerman (1995), we considered different ways individual differences in FCA would be related to exposure and emotional reactivity to daily stressors, and four questions regarding this link motivated the current study. First, are individual differences in FCA associated with exposure to daily stress? Second, are individual differences in FCA associated with how individuals subjectively rate the severity of the stressors they report experiencing? Third, are individual differences in FCA associated with emotional reactivity to daily stressors? And finally, are there age differences in the associations between FCA and exposure and emotional reactivity to daily stressors? We also explored whether the association between FCA and exposure, subjective ratings of severity, and emotional reactivity to daily stressors held across different types of stressors or was specific to certain types of events. Consistent with previous literature linking FCA as a buffer against indices of negative health and well-being, we predicted that individuals with higher levels of FCA would exhibit lower stressor exposure and be less emotionally reactive to the stressors they experience. Furthermore, we explored whether the buffering effects of FCA would be the strongest among older adults.

Method

Study Overview

Participants in the current study were a national sample from the second wave of the Midlife in the United States survey (MIDUS) that also participated in the National Study of Daily Experiences (NSDE). The National Study of Daily Experiences (NSDE: Almeida, 2005; Almeida, Wethington & Kessler, 2002) is one of the in-depth satellite studies of the Midlife in the United States survey (MIDUS), a national study of health and well-being (Brim, Ryff & Kessler, 2004). At wave 1 (1994–1995) MIDUS respondents ranged in age from 25–74 years with an oversample of people between the ages of 40–59 years, with a second wave of data collection occurring approximately 9 years later. The original data collection and follow-up included a combination of telephone interviews and self-administered questionnaires. As part of the second wave of data collection, additional measures in the areas of cognitive function, physiological and biological function, and affective neuroscience were collected. The current study utilizes data from the second wave of data collection as cognition was not assessed during the first wave.

Participants

The participants for the current study were 1,202 individuals who completed both the NSDE and cognition assessment as part of the second wave of the MIDUS. The sample had an average age of 57 (*SD* = 12, Range = 33–84), was 56% female, had an average household income of approximately $53,000, and was fairly well educated with 30% having a high school diploma or less, 51% having some college or a bachelor's degree, and 19% having beyond a bachelor's degree. The ethnic composition of the sample was 93% Caucasian, 3% African American, and the remaining 4% being comprised of Native American, Asian, and individuals representing other ethnic groups.

Materials

Daily positive and negative mood were assessed using scales developed for the MIDUS study (Kessler et al., 2002; Mroczek & Kolarz, 1998). Participants indicated how they were feeling today, by making responses on a 5-point scale (*none of the time, a little of the time, some of the time, most of the time, all of the time*). The positive mood scale consisted of 13 items, and the negative mood scale consisted of 14 items. Total scores were obtained by summing across items for each scale. Since the mood scales were administered repeatedly, we estimated reliabilities for the positive and negative mood scales at the between- and within-person levels (Hox, 2002). The reliabilities for the negative mood scale at the between- and within-person levels were .92 and .76, respectively. For the positive mood scale the reliabilities at the between- and within-person levels were .97 and .85, respectively.

Daily stressors were assessed using the Daily Inventory of Stressful Events (DISE: Almeida et al., 2002). The inventory consists of a series of stem questions asking whether certain types of daily stressors had occurred. For the purposes of the current study, we relied on questions which represented interpersonal tensions ("Did you have an argument or disagreement with anyone since (this time/we spoke) yesterday?"; Did anything happen that you could have argued about but you decided to let pass in order to avoid a disagreement?"), work-related overloads (Did anything happen at work or school that most people would consider stressful?"), home-related overloads ("Did anything happen at home that most people would consider stressful?"), and network stressors ("Did anything happen to a close friend or relative that turned out to be stressful for you?"). Dichotomous variables indicating whether each type of stressor occurred in the past 24 hours, as well as a summary variable indicating whether any of the stressors endorsed were used as measures of exposure. Subjective severity for each event was rated on a 4-point scale (0 = *not at all*; 1 = *not very*; 2 = *somewhat*; 3 = *very*).

Fluid Cognitive Ability

Fluid cognitive ability was assessed in a telephone interview using the Brief Test of Adult Cognition by Telephone (BTACT: Lachman & Tun, 2008; Tun & Lachman, 2006). The BTACT assesses key fluid cognitive domains including episodic verbal memory, working memory span and executive function, reasoning, and speed of processing. The subtests were drawn from standard neuropsychological tests that have been used in laboratory and clinical applications. The BTACT subtests shows the expected significant correlations with standardized tests that are administered in person to assess vocabulary, episodic memory, and speed of processing. Also, the tests showed no significant effect of mode of testing when administered by telephone and in-person (see Lachman & Tun, 2008; Tun & Lachman, 2006 for further details on validation and development). The BTACT tests include accuracy scores from the following subtests:

Episodic Verbal Memory was tested by immediate recall and delayed recall of a single 15-word list (Rey, 1964).

Working Memory Span was tested by backward digit span; participants heard increasingly longer sets of 2 to 8 digits, and repeated them in reverse order. Span was defined by the longest set repeated correctly (Wechsler, 1997).

Executive function was assessed by category fluency, a fluency test that requires organization (Lezak, 1995). Participants were given one minute to name as many animals as possible; the score was the total number of words produced.

Inductive reasoning was assessed with number series completion; participants attempted to complete patterned sequences of digits in a way that continued the pattern. The score was the number of correct completions out of 5 sets (Salthouse & Prill, 1987; Schaie, 1996).

Processing speed was measured with a backward counting task requiring rapid generation of a non-automatic sequence, specifically counting backward from 100 by 1; the score was the total number of digits produced correctly in 30 seconds.

Composite Score—The immediate and delayed episodic memory scores were summed and this total was converted to z-scores. The standardized memory score was averaged with z-scores for the remaining four tests to compute an overall composite score of FCA. The internal consistency for this composite was .76.

Participants scheduled the cognitive testing interview for a time with minimal distractions, and interviewers made detailed notes about any distractions. A brief screening was conducted to insure that participants could hear the materials clearly, and were asked to close their eyes to improve concentration and not to write down anything during the test.

Procedure

All data were collected via telephone interviews. As part of the MIDUS study participants first completed the telephone cognitive assessment, and approximately 3 to 6 months later, they were enrolled in the NSDE. Once enrolled in the NSDE, they completed short telephone interviews about their daily experiences and emotions. The interviews lasted approximately 20 minutes, and were conducted on 8 consecutive evenings. Data collection for the 8-day interview protocol consisted of separate "flights" of 30 participants with the start day of the interviews being staggered across the day of the week to control for the possible confounding between day of study and day of week. Participants received $45 for completing the study protocol.

Analytic Strategy

Previous research with the NSDE data has indicated that the mood and severity measures detailed above exhibit significant variability from multiple sources, including variability across events, across days, and across individuals (Almeida & Horn, 2004; Almeida, Stawski & Cichy, in press). As such all data were analyzed using multilevel models (Snidjers & Bosker, 1999) using SAS PROC NLMIXED and MIXED, with continuous variables (i.e., age and FCA) transformed to z-units. The z-transformation was implemented to facilitate interpretation of continuous variables in terms of difference per standard deviation, as well as to reduce collinearity when considering linear and quadratic age effects. Stressor exposure was modeled using a logistic multilevel model (Equation 1), where the experience of a stressor on day *i* for person *j* is the log odds of the probability of reporting a stressor to have occurred (p_{ij}), $Stress_{ij} = \log(p_{ij}/1-p_{ij})$.

$$\text{Stressor}_{ij}=B_{00}+B_{10}\text{Age}_{.j}+B_{20}\text{Age}^2{}_{.j}+B_{30}\text{Gender}_{.j}+B_{40}\text{FCA}_{.j}+B_{50}\text{MidEduc}_{.j}+B_{60}\text{HighEduc}_{.j}+u_{0j} \quad (1)$$

B_{00} reflects the log odds of experiencing a daily stressor, and parameters B_{10} andB_{40} indicate the odds of experiencing a daily stressor associated with a 1 standard deviation (SD) difference in age and FCA, respectively. B_{20} reflects a quadratic association between age and stressor exposure. B_{30} reflects the gender difference in the odds of experiencing a daily stressor, and B_{50} and B_{60} reflect the group differences in the odds of experiencing a stressor for the middle and high education groups, respectively, compared to the low education group. u_{0j} is the variance component. The residual variance for logistic multilevel models, such as this, is always 3.29 (and is formally given as $\pi^2/3$; see Hedeker & Gibbons, 2006 for more detailed treatment of variance components in logistic multilevel models). Separate models were estimated for each of the stressor stem questions as well as the summary variable of whether any of the stressors were reported.

Subjective severity was modeled using a linear model as the severity ratings were treated as a continuous variable. We modeled the subjective severity using a multivariate model as days and events are crossed. Thus, severity scores for each type of event are treated as their own dependent variable. This multivariate model allows for modeling severity scores for each type of event simultaneously, including predictors of severity ratings for each type of event, and explicitly models variance components in severity scores both across persons (between-person) and across days (within-person) for each type of event separately.

$$\begin{aligned}
&\text{Level 1:}\quad \text{Severity}_{hij}=\sum_{s=1}^{m}a_{0s}d_{shij}+\sum_{s=1}^{m}e_{sij}d_{shij}\\
&\text{Level 2:}\quad \sum_{s=1}^{m}a_{0s}d_{shij}=\sum_{s=1}^{m}B_{00}d_{shij}+\sum_{s=1}^{m}B_{01}\text{Age}_{.j}\,d_{shij}+\sum_{s=1}^{m}B_{02}\text{Age}^2{}_{.j}\,d_{shij}+\\
&\sum_{s=1}^{m}B_{03}\text{Gender}_{.j}\,d_{shij}+\sum_{s=1}^{m}B_{04}\text{FCA}_{.j}\,d_{shij}+\sum_{s=1}^{m}B_{05}\text{MidEduc}_{.j}\,d_{shij}+\\
&\sum_{s=1}^{m}B_{06}\text{HighEduc}_{.j}d_{shij}+\sum_{s=1}^{m}u_{sj}\,d_{shij}
\end{aligned} \quad (2)$$

In Equation 2, Severity_{hij} is the dependent variable h, which reflects subjective severity score for each type of event, measured on day i, for person j. As the dependent variables are indexed by h = 1, …m, and the dummy variables, corresponding to the type of event are indexed by d = 1, … s., $d_h = 1$ if $s = m$, otherwise $d_h = 0$. As such, equation 2 states that at level 1, a severity score, a_{0s}, each type of event is estimated on day i, for person j. At level 2, B_{00} is the sample average severity for each type of event, and subsequently, all person-level variables are included as a predictor for each type of event. That is, age, gender, education and FCA are allowed to have a specific and unique effect on severity for each type of event, not assumed to be equivalent across events. B_{01} and B_{02} are linear and quadratic cross-sectional age trends scaled in z-units, B_{03} reflects a gender difference, B_{04} reflects the differences in severity for a 1 SD difference in FCA, and B_{05} and B_{06} test for differences in severity ratings between the middle and high education groups, compared to the low education group, respectively. u_{0j} is the random intercept variance and allows for individual differences in the average severity ratings, and has a unique estimate for each type of event, while e_{ij} is the residual variance, reflecting within-person day-to-day variation in severity ratings, and is also allowed to have a unique estimate for each type of event[1].

Emotional reactivity to daily stressors was modeled using a linear multilevel model, with emotional reactivity defined the change in mood associated with having experienced a stressor, or the level 1 stressor effect (see description below).

$$\begin{aligned} &\text{Level 1:} \quad \text{Mood}_{ij=}a_{0j}+a_{1j}\text{Stressor}_{ij}+e_{ij} \\ &\text{Level 2:} \quad a_{0j}=B_{00}+B_{01}\text{Age}_{.j}+B_{02}\text{Age}^2_{.j}+B_{03}\text{Gender}_{.j}+ \\ &B_{04}\text{FCA}_{.j}+B_{05}\overline{Stressor_{.j}}+B_{06}\text{MidEduc}_{.j} \\ &+B_{07}\text{HighEduc}_{.j}+u_{0j} \\ &a_{1j}=B_{10}+B_{11}\text{Age}_{.j}+B_{12}\text{Age}^2_{.j}+B_{13}\text{Gender}_{.j}+ \\ &B_{14}\text{FCA}_{.j}+B_{15}\text{MidEduc}_{.j}+B_{16}\text{HighEduc}_{.j}+u_{1j} \end{aligned} \quad (3)$$

According to equation 3, at level 1, a_{0j} reflects the mood score on day *i* for person *j*, on non-stressor days, and a_{1j} is a slope parameter reflecting the change in level of mood on a stressor day (i.e., the estimate of reactivity). At level 2, linear and non-linear age effects, gender (Male = 0), education, and FCA were entered as predictors of both mood (a_{0j}) and the daily stressor effect (a_{1j}). Thus, B_{00} and B_{10} represent the sample average mood and stressor effect, respectively, for 57 year old males in the lowest education group, with average FCA. B_{01} and B_{11} indicate the difference in mood and daily stressor effect, respectively with a 1 SD difference in age, while B_{12} is the quadratic age effect allowing for a non-linear association between age and the daily stressor effect on daily mood. Similarly, B_{02} indicates the rate of acceleration/ deceleration in mood with a 1 SD difference in age. B_{03} and B_{13} indicate gender differences in mood and the daily stress effect, respectively. B_{04} and B_{13} indicate differences in mood and the daily stressor effect, respectively for a 1 SD difference in FCA. B_{06} and B_{07} reflectthe difference in mood between the low education group and the middle and high education group, respectively, while B_{15} andB_{16}reflectsimilar education group differences for the daily stress effect. B_{05} reflects between-person differences in daily stressor occurrence, and including this parameter in the model adjusts for individual differences in exposure, and allows for examining between- and within-person associations between daily stressors and mood. Finally, u_{0j} and u_{1j} are variances allowing for individual differences in average level of mood and the daily stressor effect respectively, while e_{ij} istheresidual variance.

Results

Daily Stressor Exposure

On average, participants reported experiencing at least one stressor on 33% of study days (see Table 1). The percentage of study days for each type of stressor was: interpersonal stressors (19%), work-related overloads (8%), home-related overloads (8%), and network stressors (5%). Age, gender, education, and FCA were all significantly associated with exposure to any daily stressors (Table 2). Preliminary analyses indicated that the relationship between age and stressor exposure was linear as the quadratic age effect was not significant. Thus, we only present our final models which do not include the quadratic age effect A 1 SD increase in age (i.e., 12 years) was associated with being 18% less likely to experience any stressors on a given day. Women were 38% more likely to experience any stressors on a given day than men, and participants in the high education group were 83% more likely to experience any stressors than

[1]Initially, we allowed the covariances at level 2 and level 1 to be freely estimated using an unstructured variance-covariance matrix, but had problems with model convergence as 8 variance and 14 covariances were attempting to be estimated. We re-esitmated the models with a heterogeneous compound symmetry structure, allowing us to maintain unique variances at both levels for each type of event, but constraining the covariances to be identical, thus reducing the model complexity by 12 parameters as only two covariances were estimated No convergence problems arose using this parameterization, and since the person- and day-level covariances were not of substantive or central interest to the current study, we adopted this more parsimonious model.

participants in the low education group. Importantly and contrary to predictions, a 1 SD increase in FCA was associated with a 25% *greater* likelihood of exposure to any stressors.

When each type of stressor was considered separately, a similar pattern of findings emerged. A 1 SD increase in age was associated with being 20% less likely to experience interpersonal stressors, 44% less likely to experience work-related overload stressors, and 22% more likely to experience network stressors. Compared to males, females were 23% more likely to experience interpersonal stressors, 21% less likely to experience work-related overload stressors, 78% more likely to experience home-related overload stressors, and 77% more likely to experience network stressors. Individuals in the high education group were over 2 times as likely to report overload stressors at work- and home-related overload stressors, and 92% more likely to report experiencing a network stressor compared to individuals in the low education group. Similarly, a 1 SD increase in FCA was associated with being 40% more likely to experience work-related overload stressors and 30% more likely to experience home-related overload stressors. Thus, after controlling for age, gender, and education, individuals possessing greater levels of FCA were significantly more likely to experience daily stressors, particularly overload stressors occurring at work and home, than their lower functioning counterparts.

Next, we tested whether the number of stressor reported across stressor days (N = 3,687 days) varied as a function of FCA. Here, age, gender, education, and FCA were all included simultaneously as predictors of the number of stressors reported, and the results are presented in Table 3. Preliminary analyses indicated that the effect of age was linear, so the quadratic age term was dropped from the final models reported. The average number of stressors reported across stressor days decreased per standard deviation of age (estimate = -.07, SE = .01), but increased per standard deviation of FCA (estimate = .04, SE = .02). No gender differences or education differences were observed. Together, these results indicate that individuals with higher levels of FCA are not only more likely to report experiencing any daily stressor on a given day, the days they report stressors are characterized by greater numbers of stressors than individuals with lower ability.

Subjective Ratings of Stressor Severity

We next considered whether individual differences in FCA were associated with how individuals subjectively appraised the stressors they reported experiencing. Age (linear and quadratic), gender, education, and FCA were included in all models simultaneously. Results for these analyses are shown in Table 4. FCA was not significantly related to subjective severity ratings for any of the four types of stressors. We did, however, observe consistent gender differences with females reporting their interpersonal tensions (estimate = .32, SE = .05), work-related overload stressors (estimate = .26, SE = .07), home-related overload stressors (estimate = .40, SE = .07), and network stressors (estimate = .28, SE = .07) to be more severe than males. There were a couple of significant age effects, with a standard deviation increase in age being associated with lower ratings of severity for interpersonal tensions (estimate = −.16, SE = .03), and lower severity ratings of network stressors, but only among the oldest segment of the sample as the quadratic age effect was significant (estimate = −.06, SE = .03), while the linear age effect was not. Much like FCA, education was unrelated to subjective severity ratings.

Emotional Reactivity to Daily Stressors

Models were estimated to examine FCA as a predictor of emotional reactivity to any stressors, as well as by each stressor type separately. All models included linear and quadratic age trends in mood, as well as the main effects of gender, education, and FCA. In addition to FCA, age and gender were included as predictors of the daily stress effects on mood. Neither education nor the quadratic age effect were included as predictors of the daily stressor effect as preliminary analyses indicated that these effects were not significant, and removing them did not alter the results. The results for negative mood and positive mood can be seen in Table 5.

The left column of Table 5 shows that negative mood was significantly higher on days when any stressors were reported compared to stress-free days (estimate = 2.13, *SE* = .09), and individuals with a higher frequency of stress days report higher levels of negative mood (estimate = 4.62, *SE* = .30). The linear and quadratic age trends were significant indicating that negative mood decreased with age (estimate = −.23, *SE* = .07), but that this decrease tapered off among the oldest participants (estimate = .17, *SE* = .06). There were no differences in negative mood across the education categories or by gender, however, a 1 SD increase in FCA was associated with lower negative mood (estimate= −.30, *SE* = .11).

We found evidence for a number of variables moderating the daily stressor effect on negative mood. Age moderated daily stressors-related increases in negative mood, such that stressor-related increases in negative mood were reduced with increasing age (estimate = −.41, SE = .10). Most importantly, FCA moderated the daily stress effect with smaller stressor-related increases in negative mood for individuals with higher levels of FCA (estimate = −.32, SE = .15; see Figure 1a). Similar effects were observed when each type of stressor was considered separately. Figures 1b and 1c show that having greater FCA was associated with smaller stress-related increases in negative mood, but only for interpersonal tensions (estimate = −.47, *SE* = .17) and network stressors (estimate = −.66, *SE* = .23).

The right column of Table 5 shows that positive mood was significantly lower on stressor days compared to stressor-free days (estimate = −1.66, *SE* = .21), and individuals with a higher frequency of stressor days report lower levels of positive mood (estimate = −7.34, *SE* = 1.11). The linear and quadratic age trends were significant indicating that positive mood increased per 1 SD increase in age (estimate = 1.30, *SE* = .29), but that this increase tapered off among the oldest participants (estimate = −.71, *SE* = .24). There were no differences in positive mood by gender or education, or as a function of FCA. When we explored similar models for each type of stressor, we did find that FCA moderated stressor-related decreases in positive mood, but only for interpersonal tensions. Figure 2 shows that a 1 SD increase in FCA was associated with a smaller stress-related decrease in positive mood (estimate = .52, *SE* = .26).

Age Differences in the Association between Fluid Cognitive Ability and Exposure and Emotional Reactivity to Daily Stressors

Next, we considered age differences in the effects of FCA on daily stressor exposure and emotional reactivity by adding the age by FCA interaction to level 2 of our initial multilevel models predicting exposure and reactivity. Age significantly moderated the effect of FCA on daily stressor exposure, but only for work-related overload stressors ($p < .01$). The nature of the interaction indicated that effect of FCA on exposure to work-related overload stressors was larger and significant among older adults, $OR_{(+1\ SD\ Age)} = 2.34$, 95% CI = 1.46 – 3.22, than for younger adults, $OR_{(-1\ SD\ Age)} = .94$, 95% CI = .65 – 1.22, where the effect of FCA was not statistically significant. We ran a follow up analysis to determine whether the previous result was due to age and FCA being related to one's likelihood of currently being employed. Individual differences in FCA were not significantly related to employment status ($p > .25$), nor did FCA interact with age to predict employment status ($p > .50$), suggesting that the link between age, FCA, and exposure to work-related overload stressors is not an artifact of employment status. Furthermore, age did not moderate the effect of FCA on exposure to any other types of stressors (all *p*s > .30). We also estimated models examining whether age moderated the effect of FCA on daily stressor-related increases in NA or decreases in PA. None of these 3-way interactions approached statistical significance (all *p*s > .20), indicating that the effect of FCA on emotional reactivity to daily stressors was largely age invariant.

Discussion

The current study produced a number of findings. First, contrary to predictions, possessing higher levels of FCA was associated with an increased likelihood of experiencing daily stressors, particularly work-related and home-related overload stressors. Individuals with higher levels of FCA also reported greater numbers of stressors across their stressor days. Second, individual differences in FCA were not significantly related to subjective ratings of stressor severity, regardless of the type of event. Third, higher levels of FCA were associated with smaller stressor-related increases in negative mood for interpersonal tensions and network stressors, and smaller stressor-related decreases in positive mood for interpersonal tensions. Finally, the associations between FCA and exposure and emotional reactivity to daily stressors were largely age-invariant, however, older adults possessing higher levels of FCA were more likely to experience work-related overload stressors compared to younger adults. Together, these results support the differential exposure-reactivity model according to Bolger and Zuckerman's (1995) framework for daily stress processes suggesting that FCA plays an important and complex role for understanding both exposure and emotional reactivity to daily stressors.

We also replicated a number of previous findings in terms of age, gender, and education effects on exposure and emotional reactivity to daily stressors. Older adults were less likely to experience interpersonal tensions and work stressors than younger adults, but more likely to experience network stressors (Almeida & Horn, 2004). Females experienced more interpersonal tensions, stressors involving home demands, and network stressors, whereas men experienced more overload stressors at work (Almeida & Kessler, 1998). Individuals with at least a college-level education were more likely to experience overload stressors at work and home, and network stressors than individuals possessing less than a high school education (Gryzwack et al., 2004). We found that females report their stressors to be more severe than males, as do younger adults compared to older adults, replicating previous research examining the subjective severity ratings of daily stressors (Almeida & Horn, 2004; Almeida & Kessler, 1998; Bolger et al., 1991). Similarly, we observed that older adults exhibited smaller stressor-related increases in negative mood. This pattern of results is consistent with previous research showing distinct patterns of daily stressor exposure that depend on both the age and gender of an individual (Almeida & Kessler, 1998; Folkman et al., 1987), and is consistent with emotion regulation literature showing age-related increases in emotion regulation (Gross, Carstensen, Pasupathi, Tsai, Gottestam & Hsu, 1997; Labouvie-Vief, Hakim-Larson, DeVoe, & Schoeberlein, 1989).

Contrary to our hypothesis, having higher levels of FCA were associated with a greater likelihood of daily stressor exposure, and the stressor days of individuals with higher levels of FCA were characterized by greater numbers of stressors. Additionally, our analyses revealed that FCA was related to an increased likelihood of work-related and home-related overload stressors, but not interpersonal tensions or network stressors. Some have suggested that daily stressors represent the routine challenges individuals face in their daily lives (Almeida, 2005). Thus, our results indicate that individuals with higher levels of FCA possibly lead busier and more engaged lives, taking on more responsibilities at work and home. This pattern of results is consistent with Grzywacz et al. (2004) who found that higher education was associated with greater stressor exposure. The current results, however, show that FCA is predictive of exposure to both work- and home-related overload stressors independent of education. While daily stressors have negative consequences, their occurrence may serve as a proxy for the lifestyle one leads, and the extent to which individuals are engaged socially and professionally (e.g., Hultsch, Hertzog, Small, & Dixon, 1999). The results of the current study, along with Grzywacz et al. (2004) provide converging evidence that those who have more, in terms of education and FCA, may live more complex and engaged lives, both socially and professionally, which in turn may increase the likelihood for experiencing daily stressors. Alternatively, these individuals may intentionally take on more responsibilities to create more complex and stimulating environments for themselves. Or, as some have suggested, complex activities may promote or maintain cognitive function (e.g., Schooler & Mulatu, 2001; Schooler, Mulatu & Oates, 1999). Thus, differences in FCA may provide insight into the type of environments one lives in or creates for him or herself.

An alternative explanation of the positive association between FCA and stressor exposure is that the events reported by individuals with greater FCA are somehow qualitatively different than the events reported by individuals with lower levels of FCA. Lazarus (1999) stated that a stressor was any event that represented threat, challenge, or danger to an organism. If there are qualitative differences in the events that people of differing levels of FCA report, then the relationship between FCA and stressor exposure could be more complex than what we observed with the current data. For instance, individuals with greater FCA may be experiencing stressors that represent challenges, whereas individuals with lower FCA may be experiencing stressors that represent threats.

We also considered how individual differences in FCA would be related to subjective ratings of stressor severity. Contrary to our expectations, we found no significant associations between FCA and the subjective severity ratings across any of the stressor types. That is, the severity of the events that people of varying levels of FCA are reporting is comparable. This pattern of results indicates that the differences in stressor exposure that we observed cannot be attributed to systematic differences in the severity of the stressors that individuals of varying levels of FCA report experiencing.

When we considered whether individual differences in FCA would buffer emotional reactions to daily stressors, the results confirmed our hypothesis, however, the pattern of results was more complex than we had expected. Possessing higher levels of FCA was associated with significantly smaller increases in negative mood, but was not significantly related to decreases in positive mood. One explanation for the specificity of this finding is that negative emotions are more cognitively demanding, and thus require greater FCA to process (Labouvie-Vief, 2003). If negative emotions are more complex to process than are positive emotions, possessing higher levels of FCA could help an individual to better regulate their negative emotional experiences, but have little effect for regulating positive emotional experiences (e.g., Gross, 2001). Additionally, we found that greater FCA were associated with significantly lower average levels of negative mood, but were not significantly associated with positive mood. Together, these findings suggest that FCA is an important predictor of negative mood states, but less so for positive mood states.

When we considered the moderating role of FCA on emotional reactivity by stressor type, another interesting pattern of results emerged. The moderating effect of FCA on daily stressor-related increases in negative mood was specific to interpersonal tensions and network stressors. We also found that FCA buffered stressor-related decreases in positive mood for interpersonal tensions, but not for any other types of events. This differential pattern of associations based on the type of stressor was unexpected, and may be attributable to stressor characteristics. Work- and home-related overload stressors may be more predictable than interpersonal tensions and network stressors in terms of their occurrence, who is involved, and what the stressor was about. If stressors are less predictable, then having a higher level of FCA may provide an individual with added flexibility to cope with these less predictable events, which is consistent with current theory linking intellectual function to health (Gotfredson and Deary, 2004).

Experience in dealing with certain types of stressors may also be important. If work- and home-related overload stressors are fairly constant or routine, then the types of stressors that emanate from these domains are likely familiar, yielding more experience in coping with these types of stressors. In contrast, the contexts and content of interpersonal tensions and network stressors, stressors involving one's social network, could be far more idiosyncratic, rendering experience of little benefit. Thus, possessing higher levels of FCA may allow an individual to adapt to stressors more efficiently and effectively. These types of stressors may also be more emotionally laden, making FCA more important for emotional regulation. Together the results from our examination of FCA moderating emotional reactivity to daily stressors suggest that FCA is important for predicting mood state in general as well as under conditions of stress, and that it is important to examine specific types of events when considering the relative impact of resilience/vulnerability factors.

Our pattern of results regarding associations between FCA and the daily stress process is largely consistent with the larger body of research on FCA and health, which suggests that FCA can buffer against negative health outcomes because these individuals will be most adept at preventing disease, illness, and injury (Gottfredson & Deary, 2004). The results of the current study are consistent with this pattern of findings as FCA buffered against emotional reactions to daily stressors. If stressors can be thought of novel situations that require adaptation, or are potentially problems that needs solving in order to end the event, then people possessing greater ability related thinking, acting, and solving problems that are novel may likely be better tempering reactions or adapting to stressors when they do occur. Furthermore, some have argued that stress reactivity, including reactivity to daily stressors, is a central mechanism underlying long-term consequences (Almeida, 2005; Caccioppo, 1998; Zautra, 2003). Thus, links between FCA and health may in part be attributable to reactivity to the stressors that people experience, daily, life events, or chronic. While we cannot test such hypotheses with the current data, the known associations make for a provocative line of investigation linking FCA to long-term health outcomes through basic stress processes, which could be a fruitful line of future research.

When we considered age differences in the association between FCA and exposure and emotional reactivity to daily stressors, results revealed that the observed effects were largely age invariant. There was, however, one exception to this pattern. The positive association between FCA and exposure to work-related overload stressors was strongest among older adults. This might suggest that older adults with greater FCA are working more demanding jobs, thus having to take on a greater amount of professional responsibilities compared to their counterparts with lower ability. Such a finding is consistent with previous research on occupational complexity and cognition (e.g., Andel, Kareholt, Parker, Thorslund & Gatz, 2007). An alternative and potentially more parsimonious explanation would be that older adults possessing higher levels of FCA are simply more likely to be working or volunteering, and therefore have the opportunity to experience these types of stressors. Although, our preliminary analyses exploring this explanation suggest that this is not the case. While more thoroughly exploring the reasons for the specificity of this age difference was beyond the scope of the current study, this result indicates that future work is merited to understand how individual differences in FCA may help explain the types of experiences people have at work, as well as who will continue to remain in the workforce during periods of advanced age.

Limitations

The current data cannot determine the direction of causality. Similarly plausible interpretations are that individuals experiencing more frequent daily stressor exposure have greater FCA, and that greater emotional reactivity to daily stressors predicts having lower levels of FCA. Future research examining these linkages longitudinally would help address this issue. Also, the mechanisms driving the effect of FCA on exposure and emotional reactivity remain unclear. Individuals with greater FCA may be better at controlling their environments or the types of environments they exposure themselves to. These individuals may also be minimizing negative emotional experiences through psychological resilience by employing more effective coping strategies, or positive reappraisal of the stressful events when they occur. While the current study cannot speak to the exact mechanism(s) linking FCA with exposure and emotional reactivity to daily stressor, this would be a fruitful area for future inquiry. Additionally, the effects of FCA on daily stress processes could reflect systematic differences in the criteria for reporting on stressors, not true exposure and reactivity. For instance, our finding that FCA was associated with greater exposure was specific to work- and home-related overloads, and these two stressor stems questions prompted people to report whether anything happened that most people would consider stressful. Thus, the observed effect could have more to do with the way individuals responded to the question, and their criteria for endorsing such a question, than whether they are indeed more likely to experience these types of stressors. Another limitation is that our assessment of cognition was limited to tasks which measure fluid ability. Crystallized ability, which reflects experiential and accumulated knowledge, may also play an important, possibly an even more important, role in understanding daily stress processes. While our models did control for education, which might serve as a proxy for crystallized cognitive ability, future research is needed to assess the simultaneous contribution of both ability domains. Lastly, the current data come from daily reports, which permit linking the events experienced on a given day to the mood reported on that day. This type of data cannot be used to temporally specific events to event-specific emotional responses to determine whether the role of FCA on stress processes would be observed when considering event-specific stress processes in real time. Alternative study designs such as ecological momentary assessment could help address this issue.

Conclusion

Daily stress research has sought to identify factors associated with exposure and reactivity to events occurring in people's daily lives (Almeida, 2005; Bolger et al., 2003; Tennen et al., 2000). While numerous sociodemographic and psychosocial factors have been considered, this study represents the first demonstration of FCA as an important factor in the daily stress process, and corroborates previous research linking FCA to long-term health outcomes. Individuals possessing higher levels of FCA reported greater exposure to work- and home-related overload stressors, as well as smaller emotional reactions to interpersonal tensions and network stressors. Our measure of FCA includes indicators of processes that are likely critical for navigating the complexities of everyday life and regulating emotional reactions. This composite included cognitive mechanisms that would help with balancing multiple roles, making quick decisions, good judgment and reasoning, and navigate complex and novel tasks and situations. Possessing higher levels of FCA enables one to engage in a more complex life, as well as handle it. The results of the current study also highlight the importance of considering differences across events as certain resilience/vulnerability factors found to be important for one type of event may not emerge as important for other types of events. Thus, although FCA do not protect against exposure to stressors, they do provide a buffering effect allowing for greater emotional resilience in the face of daily stressors across adulthood and old age.

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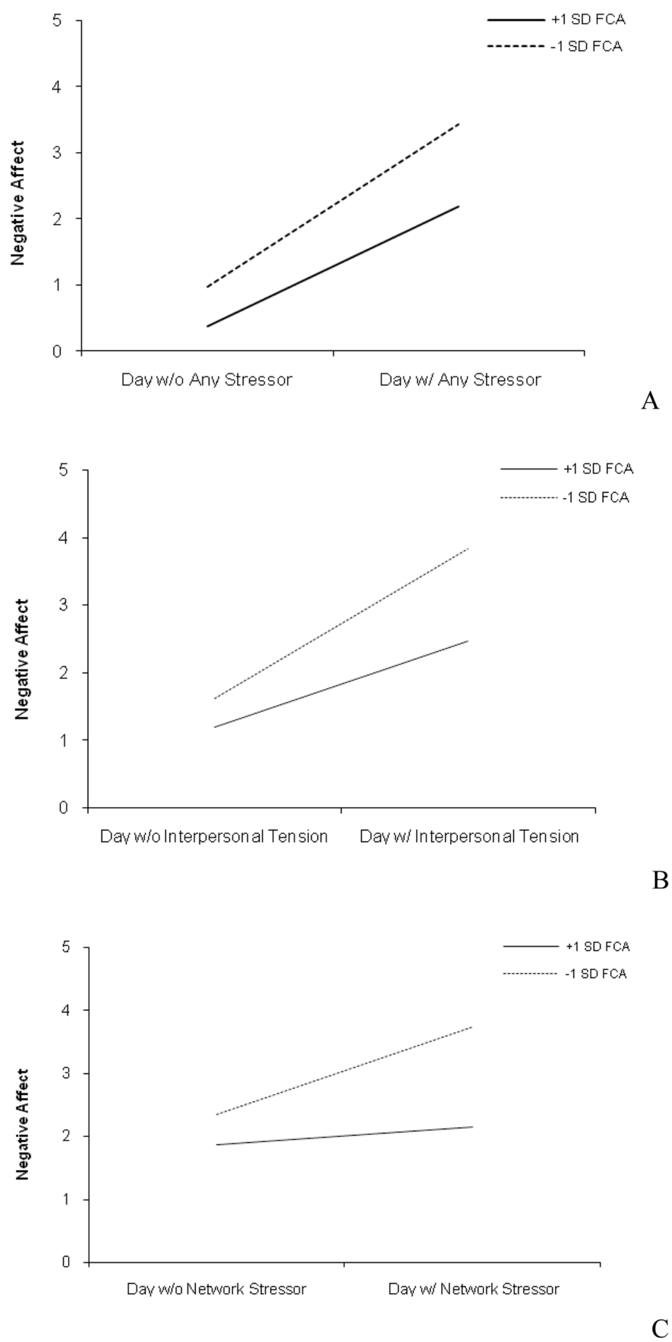

Figure 1.
Stressor-Related Changes in Daily Negative Mood as a Function of Fluid Cognitive Ability (FCA) for (A) Any Stressors, (B) Interpersonal Tensions, and (C) Network Stressors.

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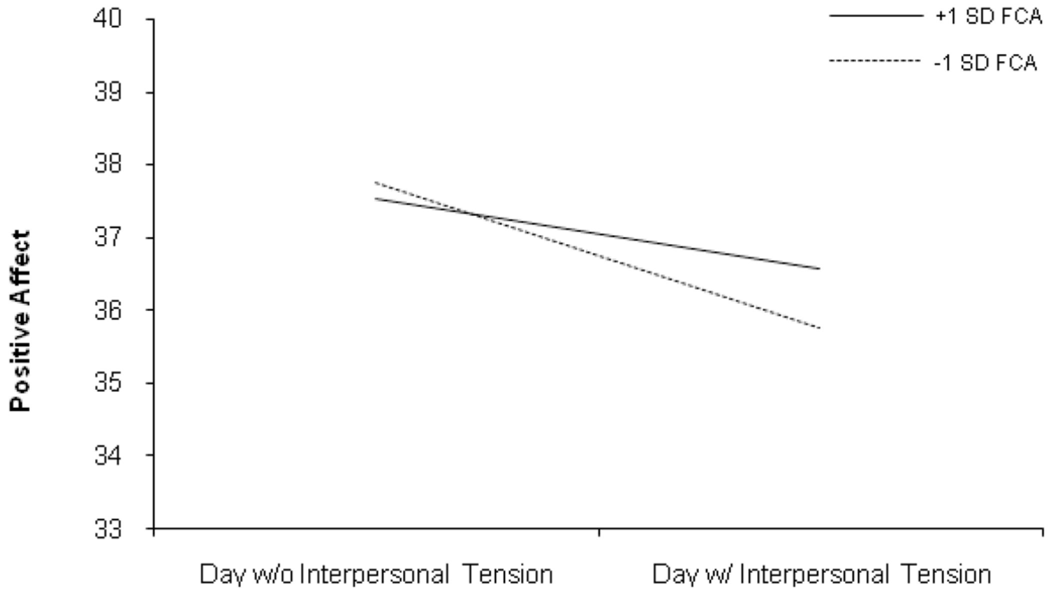

Figure 2.
Stressor-Related Changes in Daily Positive Mood as a Function of Fluid Cognitive Ability (FCA) for Interpersonal Tensions.

Table 1

Descriptive Statistics for Stress, Mood and Fluid Cognitive Ability.

	M	SD	r_{age}	Males	Females	*p*
Daily Stress (% of Days)						
Any Stressors	33%	47%	$-.23^{**}$	30%	36%	<.01
Interpersonal Tensions	19%	40%	$-.21^{**}$	18%	21%	<.01
Overloads (Work)	8%	26%	$-.27^{**}$	8%	7%	.04
Overloads (Home)	8%	27%	$-.05^{+}$	6%	10%	<.01
Network Stressors	5%	21%	$.06^{*}$	3%	6%	<.01
Negative Mood[a]	2.42	2.88	$-.17^{**}$	2.10	2.67	<.01
Positive Mood[a]	35.58	9.03	$.18^{**}$	35.78	35.42	.49
Fluid Cognitive Ability	0.02	0.66	$-.45^{**}$	.03	.01	.67

[a] *Note:* Average scores across 8 study days.

[+] p=.06,

[*] p<.05,

[**] p<.01.

Table 2

Results of Logistic Multilevel Models Examining Age, Gender, Education and Fluid Cognitive Ability Effects on Daily Stressor Exposure by Stressor Type

	Any Stressor	Interpersonal Tensions	Overloads – Work	Overloads – Home	Network Stressors
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age	.82 (.76 – .88)**	.80 (.74 – .87)**	.56 (.48 – .64)**	1.03 (.91 – 1.14)	1.22 (1.06 – 1.38)**
Gender	1.38 (1.20 – 1.57)**	1.23 (1.05 – 1.40)**	.79 (.61 – .97)*	1.78 (1.42 – 2.14)**	1.77 (1.35 – 2.20)**
Education (Reference =Low)					
Middle	.99 (.81 – 1.17)	1.05 (.85 – 1.24)	1.01 (.70 – 1.32)	1.26 (.94 – 1.59)	.79 (.55 – 1.04)
High	1.83 (1.41 – 2.26)**	1.28 (.97 – 1.59)	2.02 (1.24 – 2.80)**	2.12 (1.43 – 2.82)**	1.92 (1.20 – 2.65)**
FCA	1.25 (1.10 – 1.39)**	1.14 (1.00 – 1.29)	1.40 (1.12 – 1.69)**	1.30 (1.08 – 1.52)**	1.25 (1.00 – 1.51)

* $p < .05$,

** $p < .01$.

FCA: Fluid Cognitive Ability. OR: Odds Ratio. Gender (0 = Male, 1 = Female)

Table 3

Results from Multilevel Models Examining the Effects of Daily Stress, Age, Gender, Education, and Fluid Cognitive Ability on Number of Daily stressors Reported Across Stressor Days.

	Number of Stressors
Fixed Effects	**Estimate (*SE*)**
Intercept	1.11 (.01)**
Age (Linear)	−.07 (.01)**
Gender (Female = 1)	.03 (.02)
Education (Reference = Low)	-
Middle	−.05 (.03)
High	−.05 (.03)
FCA	.04 (.02)*
Variance Components	
Intercept	.03 (.01)**
Residual	.32 (.01)**

* $p < .05$,

** $p < .01$.

FCA: Fluid Cognitive Ability. Gender (0 = Male, 1 = Female)

Table 4

Results from Multilevel Models Examining the Effects of Daily Stress, Age, Gender, Education, and Fluid Cognitive Ability on Subjective Stressor Severity by Stressor Type.

	Interpersonal Tensions	Work Stressors	Home Stressors	Network Stressors
	Estimate (*SE*)	**Estimate (*SE*)**	**Estimate (*SE*)**	**Estimate (*SE*)**
Intercept	1.45 (.04)**	1.67 (.06)**	1.72 (.06)**	1.86 (.06)**
Age (Linear)	−.16 (.03)**	−.10 (.06)	−.06 (.04)	−.03 (.04)
Age (Quadratic)	−.03 (.02)	−.03 (.05)	−.01 (.03)	−.06 (.03)*
Gender	.32 (.05)**	.26 (.07)**	.40 (.07)**	.28 (.07)**
Education (Reference = Low)	-	-	-	-
Middle	−.03 (.05)	−.02 (.09)	−.07 (.09)	−.06 (.08)
High	.04 (.07)	−.13 (.11)	−.03 (.10)	.02 (.10)
FCA	−.07 (.04)	−.03 (.06)	−.09 (.06)	−.04 (.05)
Variance Components				
Intercept[1]	.16 (.02)**	.23 (.04)**	.16 (.04)**	.11 (.03)**
Residual[2]	.52 (.02)**	.44 (.03)**	.47 (.04)**	.34 (.02)**

* $p < .05$,

** $p < .01$. FCA: Fluid Cognitive Ability.

Gender (0 = Male, 1 = Female)

[1] Heterogenous compound symmetry correlation at level 2: Estimate = .88 (SE = .08), p < .01

[2] Heterogenous compound symmetry correlation atlevel 1: Estimate = .05 (SE = .05), n.s

Table 5

Results from Multilevel Models Examining the Effects of Daily Stress, Age, Gender, Education, and Fluid Cognitive Ability on Daily Mood

	Negative Mood	Positive Mood
Fixed Effects	**Estimate (*SE*)**	**Estimate (*SE*)**
Intercept	.68 (.19)**	39.01 (.78)**
Daily Stress (WP)	2.13 (.09)**	−1.66 (.21)**
Daily Stress (BP)	4.62 (.30)**	−7.34 (1.11)**
Age (Linear)	−.23 (.07)**	1.30 (.29)**
Age (Quadratic)	.17 (.06)**	−.71 (.24)**
Gender	−.18 (.13)	−.42 (.52)
Education (Reference = Low)		
Middle Education	−.27 (.15)	.69 (.59)
High Education	.04 (.19)	.26 (.78)
FCA	−.30 (.11)**	.14 (.46)
Daily Stress (WP) x FCA	−.32 (.15)*	.14 (.23)
Daily Stress (WP) x Age (Linear)	−.41 (.10)**	.12 (.15)
Daily Stress (WP) x Gender	−.31 (.18)	−.33 (.27)
Variance Components		
Intercept	3.02 (.20)**	72.31 (3.20)**
Daily Stress (WP)	3.89 (.38)**	2.82 (.83)**
Intercept/Daily Stress (WP) Covariance	1.48 (.18)**	−3.78 (1.23)**
Residual	6.48 (.11)**	23.46 (.40)**

* $p < .05$,

** $p < .01$.

FCA: Fluid Cognitive Ability. WP: Within-Person, BP: Between-Person. Gender (0 = Male, 1 = Female)