Personality, Self-Perceptions and Daily Variability in Perceived Usefulness Among Older Adults

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Abstract

Age based self-stereotyping is associated with a variety of long-term physical health and psychological well-being outcomes for older people. However, little is known about how older individuals' day-to-day experiences of functional limitations may be related to concurrent self-appraisals on dimensions representing negative age stereotypes. We examined how distal personality traits and global self-perceptions of aging at baseline affect processing of daily experiences relevant to age based self-stereotyping over time. Data from the 100-day internet-based Personal Understanding of Life and Social Experiences (PULSE) study (N = 98, age = 52 – 88) were used to examine the link between personality and self-perceptions of aging to differences in two age stereotype-relevant daily experiences: cognitive limitations and variation in usefulness. Multilevel random coefficient models suggested that personality and self-perceptions of aging were associated with the level of usefulness and the frequency of reporting trouble concentrating during the study period. Daily experiences of trouble concentrating were significantly associated with lower perceived usefulness on that day, and conscientiousness moderated this relationship. By linking personality and global self-perceptions to daily experiences, our findings contribute toward understanding self-stereotyping processes by which personality and perceptions may affect long-term outcomes.

Keywords: ageism, stereotype, personality, usefulness, conscientiousness, attitudes toward aging, intraindividual variability, person-environment relation

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Ageism poses formidable challenges to optimal development in later life. Negative old age stereotypes are known to diminish health and well-being outcomes of older adults including memory performance, gait speed, cardiovascular functioning, will to live, and longevity (Levy, et al., 2002; Levy, 2003; Levy, 2009; Hess, et al., 2003). The effects of negative age stereotypes are especially potent because these beliefs, in addition to being experienced as discrimination from others, are often internalized and then experienced by older adults as negative self-stereotypes (Levy, 2003, 2009). In general, age stereotypes are multifaceted and complex both in valence and content but negative stereotypes tend to be more strongly represented than positive ones (Hummert, 2011; Kite, et al., 2005). Older people are often perceived to be high in warmth and low in competence (i.e., "dear but doddering," Cuddy, Norton, & Fiske, 2005) while other negative stereotypes frame typical older adults as useless, senile, reclusive, curmudgeonly, asexual, obsolete, and lonely (Hummert, 2011; Palmore, 1999, p. 24). Given their deleterious potential, it is important to understand the complex processes by which people experience negative stereotypes within the daily social environment. Theory suggests that the experience of everyday events, including those relevant to age related changes and age based (self)stereotypes, should be conditioned by the personality system and background psychological characteristics of the individual (Hooker & McAdams, 2003; Diehl & Wahl, 2010; Diehl, et al., 2014; Levy, 2009).

Trait-based approaches to personality such as the Big Five have inspired a large body of work tying individual differences to outcomes in aging. Other approaches to personality such as Hooker and McAdams' (2003) *six foci model* move beyond traits to articulate both structure (e.g., traits) and process constructs (e.g., states, self-regulation) of the personality system, encouraging research that captures additional complexity of the person in context (Diehl & Hooker, 2013).

Older adults' day-to-day experiences can be captured in situ when research focuses on states, i.e., intraindividual variability in transient feelings such as hunger, anxiety, or mood, that fluctuate over short time periods and characterize within-person processes that drive change or the potential for change (Hooker & McAdams, 2003, p. 296; Ram & Gerstorf, 2009). Drawing on both structure components of personality and transient states related to self-regulation allows for a richer conceptualization of the person in context (e.g., Fleeson, 2001), increased ability to address sophisticated questions about personality-health associations (e.g., Hooker, Choun, Mejía, Pham & Metoyer, 2013), and should enable more accurate predictions about outcomes. In this study we examine the role of trait conscientiousness, trait neuroticism, and global self-perceptions of aging in the perception of stereotype-relevant experiences, specifically, the coupling of day-to-day usefulness and trouble concentrating.

Daily Experiences of Usefulness and Functional Limitations

Functional limitations and self-appraisals of usefulness and productivity underlie experiences of self-stereotyping. The negative stereotype that old age renders people less productive (e.g., Polizzi, 2003) or less useful to others and society (Levy & Banaji, 2004; Palmore, 1999) has important implications for older people given that feeling less useful is negatively associated with indicators of optimal aging. Higher usefulness is linked to lower risk of disability and mortality in aged populations (Okamoto & Tanaka, 2004; Pitkala & Laakkonen, 2004) and changes in perceptions of usefulness over time predict disability and mortality (Gruenewald, et al., 2007, 2009). Gruenewald and colleagues (2012) found that high social usefulness among older adults in their 60s and 70s, contributed to lowered risk of physical disability and mortality as they aged into their 70s and 80s. Similar to these findings, Adams, et al.'s (2011) review concluded that productive engagement is associated with well-being in later

life. For instance, engagement as studied in the volunteerism literature leads to decreased depressive symptomology (Gottlieb & Gillespie, 2008). Social engagement, including productive activities such as gardening, shopping, and preparing meals, are negatively associated with depression and with decreased depressive symptoms among those with fewer depression symptoms at baseline (Glass, et al., 2006).

In this literature, usefulness and productivity are closely associated constructs with meaningful conceptual overlap. For example, Gruenewald frames the desire to be useful as a reason to engage in productive activities (e.g., volunteering). Productivity in adult development has also been theorized and measured as inclusive of examples of productivity across domains (e.g., employment, intellectual, emotional, interpersonal; Staudinger & Bowen, 2011), which includes activities that make one useful to others. Importantly, research to-date on usefulness and productivity examines between-person, or trait-like, differences in perceptions of usefulness-related constructs. The question is left open as to how within-person variation in transitory state-like feelings of usefulness and productivity is connected to the daily occurrences of limitations.

In addition to usefulness, experiences of functional limitations also provide an entry point to understanding the daily context and process of self-stereotyping. Studies of stereotype threat (e.g., Hess, Hinson, & Hodges, 2009) frequently examine cognitive performance, a salient outcome for older adults. Hess and colleagues (2009) showed that the young-old are particularly susceptible to stereotype threat effects on cognitive performance. Stereotype threat effects occur when the performance environment cues low expectations for older people (or some other negatively stereotyped social category; Steele, Spencer & Aronson, 2002). The perceived threat of confirming the low, stereotype-based expectations leads older people to perform below their true ability via increased anxiety, decreased motivation, or allocation of attention to the negative

stereotype cue rather than the performance task (Schmader, Johns & Forbes, 2008). Despite the relevance of trouble concentrating for the context in which self-stereotyping can occur, it is not known whether this type of limitation is associated with negative age self-stereotyping in people's daily experiences. Although assessments of within-person variability in cognition have not been linked to age stereotypes (e.g., Neupert & Allaire, 2012), exposure to negative age stereotypes are known to induce poor cognitive performance (e.g., Levy, 2003). Because attentional resources are implicated in the process by which this occurs, it is reasonable to expect that experiences of trouble concentrating would be salient for older adults and implicated in the process by which stereotype consistent self-appraisals are formed. With respect to the salience of trouble concentrating, indeed there is evidence of increased sensitization to cognitive functioning with age (Fingerman & Perlmutter, 1994; Heckhausen, Dixon, & Baltes, 1989). Beyond sensitization, older adults should actually experience increased prevalence of mild limitations such as trouble concentrating, given that decreased performance on executive function tasks involving attentional control is associated with normal age-related structural changes in the prefrontal cortices (Rodrigue & Kennedy, 2011).

Although self-appraisals of low usefulness and experiences of cognitive limitations should be implicated in self-stereotyping, neither type of experience need always be perceived as age related. However, for older adults who are likely to have internalized negative age stereotypes over their lifespan within an ageist sociocultural context (Nelson, 2002; Levy, 2009), such daily occurrences should have relevance for negative age based stereotyping. In addition to being more sensitive to cognitive limitations, in older adulthood people also see age stereotypes as self-relevant (e.g., Levy, 2003) and these beliefs are more likely to shape older individuals' interpretation of personal experiences and expectations (Levy, 2009; Diehl & Wahl, 2010). For

these reasons, we expect that cognitive limitations in people's daily experiences are associated with the negative age based stereotype of low perceived usefulness or productivity on that same day. Measuring intraindividual variability can address how self-stereotyping processes unfold on a micro time scale, which could help explain the association of personality traits and self-perceptions of aging to long-term outcomes (Hooker, Hoppmann & Siegler, 2010).

Personality Traits and Self-Perceptions of Aging

One of the primary goals of personality research conducted at the trait level of analysis is to understand how traits shape person-context interactions (Hooker & McAdams, 2003). Both personality traits and global beliefs such as self-perceptions of aging are theorized to shape individuals' understanding of their personal experiences (Hooker & McAdams, 2003; Levy, 2009). Conscientiousness, neuroticism, and self-perceptions of aging are of particular relevance because of their association with long-term well-being and physical health outcomes (e.g., Hampson & Friedman, 2008; Levy & Zonderman, 2009) in addition to age based self-stereotypes.

Conscientiousness refers to the inclination to be ambitious, productive, organized, planful, to exchange long-term goals for short-term goals, and to exercise self restraint through effortful control (Costa & McCrae, 1997; Costanzo, 2014). It is associated with productivity, as well as feeling younger, reduced risk of illness, increased longevity, and a number of health protective behaviors such as lower likelihood of smoking, drug and alcohol use, higher activity level, safer driving, and healthier eating (Bogg & Roberts, 2004; Friedman, et al., 1993; Hampson & Friedman, 2008; Shanahan, et al., 2014). For this reason, conscientiousness is thought to be involved in a variety of biopsychosocial processes influencing health and well-being. These processes may involve self-stereotyping, given that conscientiousness is also related to lower

aging anxiety (Harris & Dollinger, 2003) and more positive attitudes toward aging (e.g., Shenkin & Laidlaw, 2014). Because conscientiousness is associated with health protective behaviors and beliefs, older adults higher in conscientiousness should not only experience fewer instances of cognitive limitations, but they should also maintain a sense of usefulness and productivity when the occasional occurrence of cognitive limitations does occur.

In contrast, older people higher in neuroticism should be likely to experience more instances of cognitive limitations and stronger concurrent negative self-appraisal of usefulness and productivity in the context of these limitations. Neuroticism and the associated emotional instability, tendency to experience negative affect, fear, depression and anxiety, and self-consciousness is, in contrast to conscientiousness, grounded in avoidance temperament and linked to negative outcomes for health and well-being (Costa & McCrae, 1997; Hampson & Friedman, 2008). These include higher risk of obesity, diabetes, cardiovascular problems and longevity (Hampson & Friedman, 2008) an occur, in part, through health practices and physiological responses. Those high in neuroticism tend to evoke more stressful experiences and react more strongly to them. For example, the relationship between daily stress and negative affect is stronger for these individuals (Mrozcek & Almeida, 2004). High neuroticism is associated with negative age stereotypes (e.g., Shenkin & Laidlaw, 2014), which mediate the trait's association to poor subjective health (Moor, et al., 2006).

Beyond conscientiousness and neuroticism, a substantial body of research also highlights the importance of self-perceptions of aging for perceived usefulness (e.g., Lawton, 1975), memory performance, physical health and psychological well-being (e.g., Levy, 2003; Levy, Slade, Kunkel, & Kasl, 2002). Diehl and colleagues (2014) provide the helpful distinction that self-perceptions of aging are theorized as a tacit form of self-knowledge based on one's personal

experiences of aging and refer to individuals' view of themselves becoming older (Levy, 2003, p. 207). In contrast, age self-stereotypes are the application of age stereotypes, understood as a subset of beliefs about aging that related to discrimination or prejudice, to the self (Diehl et al., 2014, p.3). Stereotype embodiment theory (Levy, 2009) also highlights a degree of conceptual overlap between the two terms and describes that the effects these beliefs arise as a function of internalizing age stereotypes from society to the individual's views of self across the lifespan. As a result of aging into the category of "old people," age stereotypes take on increased self-relevance, target the self as self-stereotypes or self-perceptions of aging, and impact long term health and well-being through psychological, behavioral and physiological pathways. Our expectation for positive self-perceptions of aging is similar to that for conscientiousness: because of the association with health-protective behaviors and beliefs, we expect older adults with positive self-perceptions of aging to report less frequent experiences of cognitive limitations and to maintain a sense of usefulness and productivity when experiences of minor cognitive limitations do occur.

The Present Study

This study uses a microlongitudinal design with 100 daily measures of usefulness/productivity and trouble concentrating to investigate how daily experiences relevant to age self-stereotypes are processed as a function of the personality system. Three questions guide our research: 1) How are trait conscientiousness, trait neuroticism and global self-perceptions of aging linked to the level of usefulness/productivity over 100 days? Based on previous research we expect that higher trait conscientiousness and more positive self-perceptions of aging would predict a higher average level of usefulness/productivity and that higher trait neuroticism would predict a lower level of usefulness/productivity over the 100 days.

2) Are day-to-day feelings of usefulness/productivity linked to daily variation in experiences of trouble concentrating, and does this association vary across individuals? We expect daily experiences of trouble concentrating to be associated with decreased feelings of usefulness/productivity on that day. 3) Can trait conscientiousness, trait neuroticism, and global self-perceptions of aging explain between-person variation in the coupling of daily usefulness/productivity and trouble concentrating? We anticipate higher conscientiousness and more positive self-perceptions of aging to predict a lower within person association of usefulness/productivity and trouble concentrating. Relative independence of the two daily measures is expected to be advantageous in that it suggests the ability to maintain a positive perception on one of the daily measures even if the outcome on the second is experienced as negative. We hypothesize that neuroticism moderates the same within person association such that individuals higher in neuroticism also exhibit a stronger coupling of usefulness and trouble concentrating on a given day.

Method

We used data from the Personal Understanding of Life and Social Experience (PULSE) project, a 100-day internet-based microlongitudinal study of 105 older adults. The study included one initial survey at baseline and 100 subsequent daily surveys. To investigate methodological questions involving multiple time scales, 25% of the participants were randomly assigned to a measurement burst group (Nesselroade, 1990) in which they completed four equally spaced bursts of 7 consecutive daily surveys for a total of 28 surveys over the 100-day period. Because the missingness was by design, and therefore met the missing completely at random assumption (Acock, 2005), the measurement groups were analyzed together and missing data were accounted for using the full information maximum likelihood function.

Participants were 105 older adults (M_{age} = 63, $Range_{age}$ = 52-88) who were recruited via email from a previously established research registry. The sample was 88% female and 97% white. Additionally, 75% had a 4-year college degree, 93% self-reported good health status, and 43% were retired. Five participants dropped out of the study, one participant was excluded for completing only 5 of the daily surveys, and one was excluded for not completing the personality measure. This yielded a final sample of 98 individuals and a total of 7,010 measurement occasions.

Initial Measures

Participants signed up for the study by following a link that was included in the research announcement. They acknowledged the explanation of research online, and then followed a link to complete the initial survey. Items assessed at baseline included demographic variables and a variety of psychological measures. The median completion time for the initial survey was 52 minutes (interquartile range: 33 minutes). The following variables were measured one time in the initial survey at baseline:

Conscientiousness and Neuroticism. Trait conscientiousness and neuroticism were measured using the two respective 12-item subscales from the 60-item NEO five factor inventory (Costa & McCrae, 1997). Cronbach's α for conscientiousness for this sample was .84 and for neuroticism it was .92. We used T-scores, as recommended by Costa and McCrae, in the analyses.

Self-Perceptions of Aging. Global beliefs about aging based in one's personal experiences were measured using the five-item Attitudes Towards Own Aging subscale of Lawton's (1975) Philadelphia Geriatric Center Morale Scale, consistent with past work (e.g., Levy, 2003). Participants completed the scale by responding either yes (1) or no (0) to items

such as “as you get older, you are less useful” and “I am as happy now as I was when I was younger.” In the final item, participants indicated whether things were getting better, getting worse, or staying the same as they grew older. These categories were collapsed into better/same (1), and worse (0). Items were summed so that a higher score indicates more positive self-perceptions of aging. In this sample, Cronbach’s $\alpha = .66$.

Daily Measures

After completing the initial survey, participants received reminder emails about the daily survey each morning and again at 2:00pm. Email reminders contained a link to the daily survey, which they were instructed to complete in the evenings. Timestamp data indicated that 83% of daily surveys were completed in the evening (after 4pm). The daily survey included instructions to answer the survey based on experiences on that day. The following time-varying proximal antecedents of AARC were measured in the daily surveys:

Trouble Concentrating. Trouble concentrating was measured with respect to each day using one item from the Self-rated Health, Pain, and Symptoms Checklist (“Trouble staying focused or concentrating” 0 = No 1 = Yes; Idler & Kasl, 1991; Winter, Lawton, Langston, Ruckdeschel, & Sando, 2007).

Usefulness/Productivity. To measure a self-appraisal representing the negative age stereotype,usefulness and productivity were assessed each day using an item (“Today I felt useful and productive”) that was modified from an item used in McAvay, Seeman, and Rodin’s (1996) study of self-efficacy among older adults (“I’ve been feeling that this month I have not been as productive as I want to”). Usefulness and productivity were combined because based on our own experience we thought older retired people might understand "productive" in terms of paid work. Including "useful" allows the item to reflect our more inclusive definition and

provides an appraisal that people still can relate to whether or not they are in the work force. Participants responded by moving a slider across a continuous visual scale that was anchored at "Strongly Disagree (0)" and "Strongly Agree (49)." To encourage the independent assessment of each day (rather than simply choosing the same number) participants did not see the numeric anchors or the numeric value of their response, although their numeric responses were logged in the database (Brose & Ram, 2012).

Covariates

Because of potential covariation between usefulness/productivity and participant characteristics, retirement status (1 = retired, 0 = not retired), age, sex (1 = female, 0 = male), and burst group membership (1 = burst measurement group; 0 = daily measurement group) were included as covariates in our analyses.

Analyses

A series of multilevel models, which account for the correlation of observations within participants by allowing the slope and intercept to vary across participants, were used to answer our research questions (Raudenbush & Bryk, 2002). To examine within-person coupling of the daily measures, as well as between-person differences in this coupling, within-person (level 1) and between-person (level 2) models were constructed. Level 1 variables were collected daily and included trouble concentrating and ratings of usefulness/productivity. Level 2 variables were time invariant, measured at baseline in the initial survey, and included age, sex (Female; 0 = no, 1 = yes), retirement status (Retired; 0 = no, 1 = yes), burst group (Burst; 0 = no, 1 = yes), conscientiousness (C), neuroticism (N) and self-perceptions of aging (SPA). Coefficients of these variables identify between-person differences in the level of usefulness/productivity across the 100 days. Day, age, conscientiousness, neuroticism and self-perceptions of aging were

centered at the grand mean. The series of models was built beginning with an unconditional model, and ending with a final model represented as follows:

$$Usefulness_{it} = \beta_{0i} + \beta_{1i}(Day_{it}) + \beta_{2i}(TroubleConcentrating_{it}) + \varepsilon_{it} \quad (1)$$

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(Age_i) + \gamma_{02}(Female_i) + \gamma_{03}(Retired_i) + \gamma_{04}(Burst_i) \quad (2)$$
$$+ \gamma_{05}(C_i) + \gamma_{06}(N_i) + \gamma_{07}(SPA_i) + u_{0i}$$

$$\beta_{1i} = \gamma_{10} + u_{1i} \quad (3)$$

$$\beta_{2i} = \gamma_{20} + \gamma_{21}(C_i) + \gamma_{22}(N_i) + \gamma_{23}(SPA_i) + u_{2i} \quad (4)$$

In equation 1, usefulness/productivity for participant *i* at measurement occasion *t* is modeled by the intercept β_{0i}, linear time trend β_{1i}, variation in trouble concentrating β_{2i}, and the within-person residual, ε_{it}. In equations 2 through 4, *u* parameters indicate that the slope and intercept were specified to vary across participants. In equation 2, the β_{0i} intercept was specified as a function of conscientiousness, neuroticism, self-perceptions of aging, and the study covariates. In equation 4, conscientiousness (γ_{21}), neuroticism (γ_{22}) and self-perceptions of aging (γ_{23}) moderated β_{2i}, the coefficient for trouble concentrating.

Data were analyzed using the xtmixed command in Stata13. Because of the correlation of the between-person variables, we first ran models with conscientiousness, neuroticism and self-perceptions of aging separately before combining them into the final models reported in Table 2. We added a first order autoregressive process (A1) to adjust for the correlation of residuals in the final model, after the likelihood ratio test against the same model without AR(1) revealed a significantly better fit. We then modeled the correlation structure of the residuals for each previous model in the sequence and report those results. Parameter estimates under the AR(1)

models were comparable. Improvement of model fit was examined using the -2*loglikelihood test, and also by estimating the proportional reduction of level 1 and level 2 variance of each model compared to the unconditional model without predictors ($R^2 = \frac{\sigma_b^2 - \sigma_m^2}{\sigma_b^2}$; Raudenbush & Bryk, 2002).

Results

Descriptive statistics for between-person characteristics including the intraindividual mean of usefulness/productivity and trouble concentrating are reported in Table 1. Higher conscientiousness was associated with fewer experiences of trouble concentrating and lower variability in usefulness/productivity (pairwise correlation (C, iSD_{useful}) $r(96) = -.20$, $p < .05$). Participants above and below the normed midpoint for conscientiousness (Costa & McCrae, 1992) reported an average of 6% and 10% of days with trouble concentrating, respectively. Those above the normed midpoint of neuroticism reported more experiences of trouble concentrating (12% versus 6% of days) and neuroticism was associated with higher variability in usefulness/productivity (pairwise correlation (N, iSD_{useful}) $r(96) = .43$, $p < .001$). Higher positivity in self-perceptions of aging at baseline was associated with fewer days with trouble concentrating (5% of days versus 14% of days for those above and below the mean), and lower variability in usefulness/productivity (pairwise correlation (SPA, iSD_{useful}) $r(96) = -.31$, $p < .01$).

The intraclass correlation for usefulness/productivity in this sample was .48, revealing almost equal proportions of within- and between-person variation. The intraclass correlation for trouble concentrating was .31, indicating less between-person variation for trouble concentrating. The mean individual standard deviation (i*SD*) for usefulness/productivity was 7.08 (*SD* = 3.22). Individuals' proportion of days with trouble concentrating ranged from 0 to .68 (*M* = .09; *SD* = .15). Thirty-six participants reported not having any trouble concentrating over the course of

the study. Thus, we compared those that did report having concentration problems and those that did not and found that there were no significant differences between the groups according to sex (χ^2 (1) = 1.04, *ns*), age (*t* (96) = -.78, *ns*), or burst group status (χ^2 (1) = .21, *ns*). The within-person correlation of usefulness/productivity and trouble concentrating was $r = -.15$, $p < .001$.

Consistent with our expectations, baseline conscientiousness (*standardized estimate* = .24, *SE* = .09, $p < .01$) was significantly associated with higher level of usefulness/productivity across the 100-day study before neuroticism was added to the model. Those higher in conscientiousness or self-perceptions of aging reported feeling more useful/productive, on average, during the study period. In model 1 (Table 2), which includes all three between-person predictors, neuroticism (*standardized estimate* = -.25, *SE* = .10, $p < .05$) and self-perception of aging (*standardized estimate* = .33, *SE* = .09, $p < .001$) exerted independent influences on the level of usefulness/productivity across the 100-day study, but including neuroticism rendered the effect of conscientiousness non significant (*standardized estimate* = .11, *SE* = .10, *ns*). This suggests that neuroticism explains more of the variation in the level of usefulness/productivity than conscientiousness. Those higher in neuroticism reported feeling less useful/productive, on average, during the study period. Together, conscientiousness, neuroticism, and self-perceptions of aging explained 32% of between-person variance in usefulness/productivity.

In Model 2 the within-person daily measure of trouble concentrating was added and found to be associated with lowered feelings of usefulness/productivity on that day (*estimate* = -6.86, *SE* = .85, $p < .001$). The estimated coupling of usefulness/productivity and trouble concentrating varied, consistent with our expectations, significantly across participants ($\chi^2(3) = 55.13$, $p < .001$). Adding daily experiences of troubling concentrating to the model

significantly improved model fit ($\chi^2(3) = 251.47$, $p < .001$), and explained 5% of the within-person variance in usefulness/productivity.

In Model 3, we examined differences in the coupling of usefulness/productivity and trouble concentrating across participants. The magnitude of coupling of usefulness/productivity and trouble concentrating varied significantly across conscientiousness (*standardized estimate* = -.08, *SE* = .03, $p < .01$) but not neuroticism (*standardized estimate* = -.05, *SE* = .03, $p = .09$) or self-perceptions of aging (*standardized estimate* = -.03, *SE* = .03, *ns*). As shown in Figure 1, and contrary to our expectations, among those lower in conscientiousness, usefulness/productivity was more weakly coupled with trouble concentrating, whereas daily perceptions of usefulness/productivity among those with higher conscientiousness were more tightly coupled with experiences of trouble concentrating. A person at the T score normed cutoff value for high conscientiousness was predicted to experience about a 9 point decrease in perceived usefulness on a day that trouble concentrating was also reported, whereas an individual at the low cutoff was predicted to experience a decrease of about 6 points. The final model explained 34% of between-person variance and 8% of within-person variance. Conscientiousness explained 18% of the between-person variation in coupling of usefulness/productivity and trouble concentrating.

Discussion

Older adults in the U.S. live in a society where they are constantly bombarded with negative stereotypes pertinent to themselves solely by virtue of their age category. In this context, older adults are challenged to find sources of resilience by processing daily experiences in an adaptive manner. Our microlongitudinal study allowed an examination of how daily experiences relevant to age self-stereotypes are experienced as a function of the personality system (Diehl & Hooker, 2013; Hooker & McAdams, 2003) and perceptions of one's own aging.

Results partially confirmed our first expectation, fully supported our second expectation, and partially supported our third expectation. First, we expected and found lower neuroticism and higher positive self-perceptions of aging to predict higher levels of perceived usefulness/productivity over the 100-day study period. However, conscientiousness had no independent association to levels of usefulness/productivity when neuroticism was included in the model. Second, we found within-person variation in usefulness/productivity to be coupled with the ability to concentrate on that day. Perceptions of usefulness/productivity were notably lower on days that participants had trouble concentrating. Third, we found this within-person association to systematically differ across levels of conscientiousness but not neuroticism or self-perceptions of aging. As anticipated, individuals high in conscientiousness, low in neuroticism, or with more positive self-perceptions of aging did report a smaller proportion of days with trouble concentrating. However we also found unexpectedly that when high conscientiousness individuals *did* experience this limitation, they were *more* sensitive to it.

Conscientiousness

Our study suggests that personality traits relate differently to processes by which experiences of self-stereotyping can arise. Some individuals appear capable of maintaining feelings of usefulness/productivity that are relatively independent from daily perceptions of trouble concentrating. Usefulness and productivity resemble the competence and achievement-striving facets of conscientiousness, and could be a more valued feature of daily experience for individuals high in conscientiousness. Consistent with the unanticipated finding that those high in trait conscientiousness experience a closer link between daily usefulness and trouble concentrating, there is emerging research about the potential downsides of conscientiousness (Costanzo, 2014; Shanahan, et al., 2014). For example, it has been linked to heightened

sensitivity to variation in global perceptions of stress (Hooker, et al., 2013), and greater variability in experiences of control (Smith, et al., 2013). One implication of this body of research, to which the current study also contributes, is the possibility that within the context of high conscientiousness, sensitivity to minor infrequent limitations, stress, and lability of control may actually represent adaptive self-regulatory processes that are discernable only via a micro analytic lens.

At the outset we presumed a weaker coupling of trouble concentrating and usefulness/productivity to be an advantageous regulatory process in that it may indicate the ability to maintain positivity on one measure in the face of a more negative daily experience on the other. However, among those higher in conscientiousness, higher sensitivity to limitations might indicate a process that potentially promotes positive outcomes on a longer time scale. Noticing and engaging with limitations in combination with being motivated to exert control over one's daily life (Smith, et al., 2013) may prompt a highly conscientious older person to take measures to limit the negative impacts of trouble concentrating, even if doing so is associated with a temporary decrease in the positivity of one's self-appraisal. For example, if driving under unfamiliar conditions one might turn the radio off to be better concentrate on GPS directions. This interpretation aligns with evidence that those high in conscientiousness tend to employ engagement or problem focused coping rather than disengagement or emotion focused coping strategies (Carver & Connor-Smith, 2010). Consistent with the idea that infrequent experiences of high sensitivity are advantageous on a longer timescale, conscientiousness was associated with less variation in usefulness in our study. This suggests that even though experiences of trouble concentrating were associated with a greater decrease in usefulness on that day, the effect was not enduring.

Identifying how this kind of within-person coupling of cognitive limitations with perceived usefulness/productivity would be related to long term outcomes is an essential next step. This is important given that our results may also suggest that individuals high in conscientiousness are especially prone to negative self-stereotyping in the context of limitations even if they hold more positive global beliefs about their own aging or experience limitations less frequently. Substantial vulnerability could arise for high conscientiousness individuals if they do begin to experience more frequent limitations.

Neuroticism

With respect to personality, we also expected trait neuroticism to moderate the same within-person association, however, the results did not support this. Although not statistically significant, the interaction of neuroticism with trouble concentrating was in the expected direction. One possibility is that because trouble concentrating was more common among high neuroticism individuals in this study, its occurrence was not as novel. A limitation, also discussed below, is that a more sensitive daily measure might have captured the expected relationship. Considering that a similar higher coupling of the daily variables was also observed under high conscientiousness, our results point to the value of further evaluating the meaning of the link between a minor cognitive limitation and usefulness on that day for different individuals. The experience of a cognitive limitation is likely to be processed differently for someone higher in neuroticism because of the associated negative reactivity, disengagement coping techniques (Carver & Connor-Smith, 2010), and accessibility of negative age stereotypes that serve as an interpretive lens for age related events (e.g., Moor, et al, 2006; Diehl & Wahl, 2010).

Self-Perceptions of Aging

In addition to personality traits, we also expected positive self-perceptions of aging to moderate the coupling of usefulness and trouble concentrating, but results did not support this prediction. One possible explanation is that the measure of self-perceptions of aging we used does not tap the cognitive domain. This could be explored further using different cognitive measures. The results suggest that personality may operate differently than self-perceptions of aging with respect to processes by which day-to-day limitations and self-stereotyping are experienced. Self-perceptions of aging, in contrast to personality, are more specifically a measure of beliefs based in one's own experiences and self-knowledge as it relates to aging (Diehl, et al., 2014). This construct may be less relevant for conditioning individuals' sensitivity or style of self-regulation in the context of a limitation. In contrast, the personality traits specifically address how individuals are likely to appraise or respond to stimuli. This often used measure of self-perceptions of aging, as a reflection of self-knowledge, may be less suited to tap the responsiveness, sensitivity, or reactivity captured in our day-to-day association of trouble concentrating and perceived usefulness/productivity.

Together, the results of this study help advance our understanding of ageism by beginning to illuminate one dynamic process by which self-stereotyping can occur in the context of cognitive limitations. The study also contributes to the growing body of work linking intraindividual variability to structural components of personality by identifying a state level process associated with trait conscientiousness (Diehl & Hooker, 2013). Such processes should have implications for the development of stable psychological characteristics of individuals if traits are markers of prior processes (Nesselroade & Ford, 1985). Over time, experiencing day-to-day negative self-stereotyping in the context of limitations could contribute to change in global self-perceptions of aging or personality structures (Roberts & Mroczek, 2008).

Limitations and Future Directions

Several limitations of the study deserve attention. The self selected sample for this study was highly educated, white, mostly female, and adept with computers, which introduces limitations to the generalizability of our findings. We were unable to investigate gender effects because males were underrepresented. Ages ranged from 55-82 but we did not directly assess the subjective age of the participants, which, as noted above is a factor determining the self-relevance of aging stereotypes. However, not knowing whether participants considered themselves "old" did not present a serious limitation because it is plausible that experiencing the day-to-day perceptions of oneself as similar to stereotypical older adults either 1) constitutes self-stereotyping if one already identifies as "old", or 2) contributes to the increased awareness of aging that leads one to eventually feel "old" if they do not already identify as such.

There may also be limitations related to reliability or restriction of range as a result of using single item assessments of usefulness/productivity and trouble concentrating. The threat to reliability was somewhat ameliorated by measurement over 100 days. Restriction of range was not a substantial limitation because we observed good variability in usefulness/productivity over the 100 days, which we attribute that to our sliding scale response format. Measuring usefulness and productivity together in the same item also required the assumption that the concepts were closely related and that participants were reporting feeling both useful and productive on a given day. A last consideration is that the limited range in dichotomous response options for trouble concentrating makes the measure relatively insensitive to capturing within-person variability. However, within this limited range this measure was still sufficient to detect a significant and meaningful relationship with daily feelings of usefulness/productivity. Our success with this approach is consistent with daily stress research using dichotomous indicators of stress related

events (e.g., Rickenbach, et al., 2012). We do suggest that more sensitive multi-item measures of cognitive limitations would be beneficial for further enhancing validity and reliability in future studies.

With respect to future directions in ageism research, there are opportunities to strengthen investigations of day-to-day experiences by drawing on the related constructs of awareness of age related change and microaggressions. Awareness of age related change (AARC) is a type of self-awareness related to the realization that something about oneself has changed as the result of growing older. It can be positive or negative and gives rise to self-regulatory strategies that promote or restrict optimal aging, respectively. The sensitivity we found among individuals high in conscientiousness may suggest that these individuals are also likely to experience pronounced AARC, or that they are more sensitive to AARC being triggered easily and as a result of smaller increments of change. Use of the heuristic frameworks related to AARC (Diehl & Wahl, 2010) and awareness of aging (Diehl, et al., 2014) could address the need for more empirical work on the ways in which awareness of aging, through daily limitations and self-stereotyping, can shape motivation and compensatory strategies. We also note that the sensitivity we found among high conscientiousness individuals is likely not limited to the cognitive domain, and we would expect similar findings with respect to events signaling age related change in physical functioning, lifestyle, or interpersonal relationships (Diehl & Wahl, 2010).

In addition, to understanding day-to-day experiences of stereotyping from others, microaggressions (Sue, 2010) are a promising concept to examine through intraindividual variability. Microaggressions are unintentional or intentional commonplace "verbal, behavioral and environmental indignities" that convey negative, hostile, or derogatory slights and insults to targeted individuals or groups (Sue, et al., 2007, p. 273). They have been studied almost

exclusively with respect to racism, sexism, and heterosexism (Sue, 2010), even though ageism is also ubiquitous and often occurs in an unrecognized or commonplace fashion (Draper, 2005; Levy & Banaji, 2004). Future research should examine age based micro aggressions using microlongitudinal designs and strategies for coping with ageism, especially in the context of employment (McCann & Giles, 2002) and health care services (Draper, 2005). Knowledge about microaggressions is a basis of cultural competence training, but our notion and efforts at cultural competence remain incomplete until age is meaningfully incorporated.

Conclusion

By linking background psychological characteristics of individuals to their daily experiences of limitations and transient feelings of usefulness and productivity we have begun to characterize a process of self-stereotyping by which personality traits and self-perceptions could potentially affect long-term health. We recommend that policies and programs for older adults be attentive to the conditions shaping perceptions of cognitive functioning. Because our study demonstrated that processes describing self-stereotyping may not generalize across individuals, efforts to ameliorate sensitivity to limitations or negative consequences of stereotyping may need to be tailored to the individual. Considering the links between usefulness and mortality, and that perceptions of limitations are tied to usefulness, we suggest that creating environments that foster positive perceptions of cognitive functioning is a way to optimize aging.

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Tables

Table 1. *Descriptive Statistics for Between-Person Variables*

Variable	1	2	3	4	5	6	7	8	9
1. Use/Prod									
2. C	.34***								
3. N	-.44***	-.55***							
4. SPA	.46***	.29**	-.38***						
5. Trouble	-.31**	-.21*	.32**	-.31**					
6. Age	-.12	.01	-.08	.09	-.16				
7. Female	-.09	-.12	.01	-.07	.17	-.00			
8. Retired	-.06	.08	-.11	.12	-.10	.57***	.01		
9. Burst	-.14	-.12	.06	-.04	.10	.15	-.02	.13	
M	36.23	46.40	48.05	3.47	.09	63.20	.88	.43	.22
SD	7.50	11.65	13.15	1.43	.15	7.93	.33	.49	.42

Note: N = 98 participants. Use/Prod = daily perception of usefulness and productivity. C = Conscientiousness T-score. N = Neuroticism T-score. SPA = Self-Perceptions of Aging. Trouble = Trouble concentrating on that day. For Trouble, Female, Retired, and Burst: 0 = No, 1 = Yes.

Table 2. *Multi-Level Random Coefficient Models*

DV: Useful/ productive	Model 1			Model 2			Model 3		
	B	*SE B*	β	B	*SE B*	β	B	*SE B*	β
Intercept	37.62***	1.90	-.09	37.80***	1.89	-.10	37.79***	1.89	-.10
Day	.01*	.01	.07**	.01	.01	.05*	.01*	.01	.05*
Age	-.15	.09	-.14	-.15	.09	-.15	-.15	.09	-.15
Female	-.66	1.89	-.04	-.63	1.88	-.04	-.58	1.87	-.04
Retired	-.67	1.52	-.04	-.81	1.51	-.05	-.90	1.51	-.05
Burst	-.94	1.52	-.06	-.80	1.51	-.06	-.78	1.51	-.05
C	.09	.06	.11	.07	.06	.11	.09	.06	.12
N	-.12*	.06	-.25*	-.13*	.06	-.25*	-.11*	.06	-.24*
SPA	1.61**	.46	.33***	1.54**	.46	.32***	1.61**	.46	.33***
Trouble				-6.86***	.85	-.20***	-7.15	.85	-.20***
Trouble X C							-.23**	.08	-.08**
Trouble X N							-.13†	.60	-.05†
Trouble X SPA							-.69	.60	-.03
Random Effects (*SD*)									
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
u	6.01	[5.19, 6.96]		6.01	[5.19, 6.96]		6.01	[5.19, 6.96]	
u Day	.05	[.04, .06]		.05	[.04, .06]		.05	[.04, .06]	
u Trouble				5.30	[3.92, 7.17]		4.79	[3.52, 6.52]	
e	7.62	[7.49, 7.76]		7.43	[7.30, 7.56]		7.43	[7.30, 7.56]	
Model Fit									
R^2 Within		.04			.08			.08	
R^2 Between		.34			.34			.34	
-2*LL		48562.48			48311.01			48300.83	

Note: N = 98 adults. N = 7,010 observations. C=Conscientiousness T-score. N=Neuroticism T-Score. SPA = Positive Self Perceptions of Aging. Trouble = Trouble concentrating on that day. For Trouble, Female, Retired, and Burst: 0=No, 1=Yes. Day, Age, C, and SPA are centered at the grand mean. *** = $p < .001$, ** = $p < .01$, * = $p < .05$, † = $p < .10$

Figures

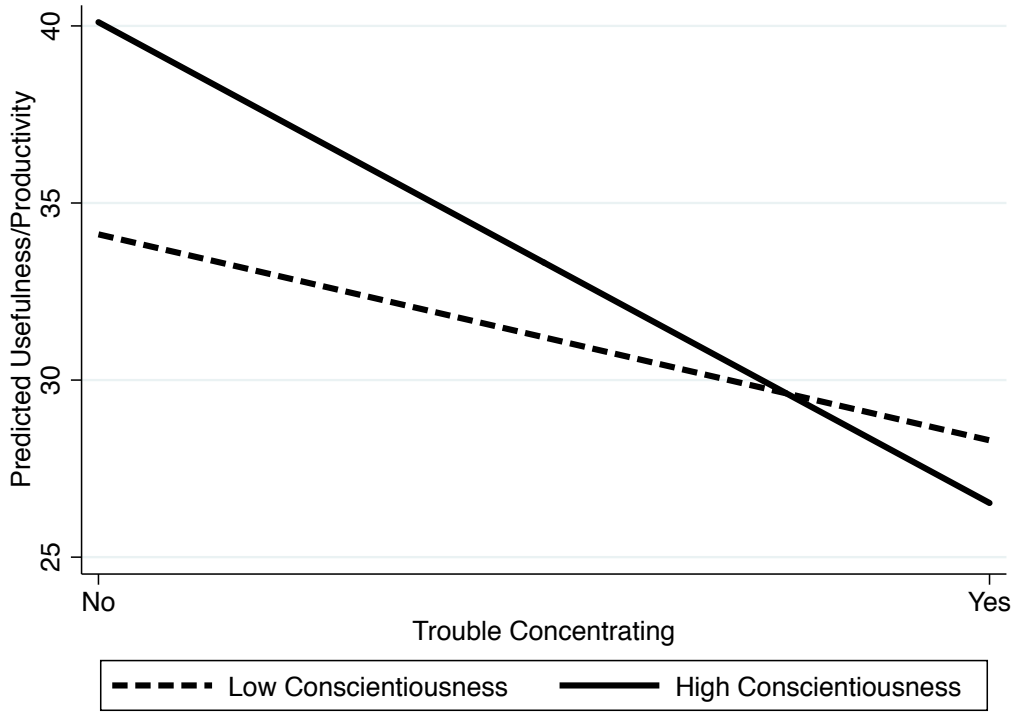

Figure 1. Interaction of Conscientiousness and Daily Trouble Concentrating

Note: Based on unstandardized coefficients and uses T-score cutoffs for high and low conscientiousness from Costa and McCrae (1992)