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published in
Alzheimer Disease and Associated Disorders
2022

DOI (link to publisher)
10.1097/WAD.0000000000000518

document version
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Download date: 28. Oct. 2023
Examining the Role of Aging Perceptions in Subjective Cognitive Decline

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Objective: While subjective cognitive decline (SCD) is gaining ground as a “preclinical” risk state for Alzheimer disease, its utility depends on our understanding of the factors linked to SCD. Rarely examined sociocultural factors including perceptions of aging may relate to the subjective experience of cognitive aging. Identifying such associations will help to refine the utility of SCD as an early marker of AD while setting the stage for addressing modifiable factors contributing to SCD.

Methods: The study consisted of N=136 participants (68% female; 73% White; 22% Black race, age=mean=74.72; education=mean=16.01). Questionnaires assessed SCD, depressive symptoms, and age perceptions (essentialist aging beliefs, subjective age, age group identification, and explicit/implicit age stereotypes). Cognitive functioning was measured with a semantic interference and learning task.

Results: SCD was correlated with essentialist aging beliefs, age identification, and depressive symptoms (r=0.18 to 0.22, P=0.00 to 0.02, confidence interval (CI)range=0.00-0.39). Essentialist aging beliefs were correlated with subjective age and age group identification (r=0.22 to 0.42, P<0.001 to 0.003, CIrange=0.08-0.57). Both age group identification and essentialism were correlated with depressive symptoms (r=0.22, P=0.009 to 0.01, CIrange=0.04-0.39). In the adjusted regression model including depressive symptoms, age perceptions, and SCD, only SCD was associated with cognition (b=−0.31, P<0.001).

Conclusion: Although correlated with SCD, perceptions of aging do not explain the relationship between SCD and performance on a sensitive cognitive test among older adults.

Key Words: subjective cognitive decline, subjective age, age stereotypes, essentialist beliefs, depressive symptoms, cognitive functioning

Subjective cognitive decline (SCD), the experience of cognitive decline in the absence of clinically significant objective cognitive impairment,1 has received attention as a potential indicator of preclinical Alzheimer disease (AD) for decades.2 A growing number of studies linking SCD to AD biomarkers such as amyloid burden, hippocampal volume, and cerebrospinal fluid tau levels have reinforced the value of SCD for identifying and understanding the earliest stages of AD,3–8 an increasingly important endeavor amidst recurring failed clinical intervention trials in symptomatic patients.9 While screening for SCD would be an inexpensive, quick, and broadly deployable manner of aiding preclinical diagnosis and improving the efficacy of clinical trials, its subjective nature complicates its straightforward interpretation as a risk state for disease.

Fundamentally, SCD is based on self-reflection, a complex and imperfect process influenced by a variety of biological (neurodegenerative disease), psychological (mood and personality), and sociocultural forces.10–12 To increase the specificity of SCD as a marker for preclinical AD, careful consideration of how SCD is measured (task factors), and the characteristics of the person in whom it is measured (person factors) is needed. Recent work on task factors has shown that asking individuals to compare their cognition to others their age optimizes the association between SCD and performance on objective cognitive tasks sensitive to very early AD.13 Regarding person factors, it is well known that subjective perceptions and/or expressions of cognitive decline are linked to psychological states and traits, most notably depressive symptoms.14 Although mood is routinely considered in understanding the context in which SCD occurs, more stable belief systems relating to aging are not formally considered or evaluated as part of clinical neurological or neuropsychological assessments.

Lifespan psychologists have demonstrated substantial heterogeneity in how individuals view and react to the changing ratio of biopsychosocial gains to losses that accompanies aging.15,16 Moreover, individuals’ perceptions about aging in general (ie, age stereotypes, essentialist aging beliefs), as well as their own aging (ie, subjective age, age group identification), have important impacts on age-related outcomes including cognitive functioning. For example, negative age stereotypes (ie, generalized representations of
older adults as impaired, non-effective, or incompetent which can be shown to have widespread negative effects on self-concept, mood, health, longevity, and cognitive performance in older adults.\textsuperscript{17–20} These detrimental effects are hypothesized to manifest when individuals internalize negative stereotypes into their cognitive schemas in a manner similar to sex and racial stereotypes.\textsuperscript{21} In addition, holding strong essentialist beliefs about aging (ie, that aging is a fixed and immutable process that cannot be influenced) has also been observed to influence cognition in older adults, in addition to exacerbating the effect of negative age stereotypes on cognitive function.\textsuperscript{22,23} Finally, beliefs about one's own aging including subjective age (ie, the age a person feels) and age group identification (in this case, the extent to which one identifies with older adults) have also been identified as playing an important role in overall subjective health and well-being\textsuperscript{24,25} as well as objective cognitive functioning in older age.\textsuperscript{26,27}

It is thus possible that SCD may relate to aging perceptions. Moreover, given the links between aging perceptions and objective cognitive performance, it is possible that such perceptions explain the association between SCD and objective cognition. Finally, as depressive symptoms have been shown to relate to all constructs of interest (SCD, cognition, and age perceptions), it is important to consider such symptoms when examining SCD in relation to age perceptions and cognitive functioning among older adults.

The first aim of this study was to examine the extent to which perceptions of aging including negative age stereotypes, essentialist aging beliefs, subjective age, and age group identification are linked to SCD. The second aim is to determine if these attitudes explain the previously demonstrated association between SCD and objective cognitive functioning. We hypothesized that feeling older than one's age, having more fixed beliefs about aging, identifying more closely with older adults, and holding more negative age stereotypes would each be associated with higher SCD. Second, we hypothesized that such perceptions may contribute to but not explain the association between SCD and a sensitive measure of cognitive function.

METHODS

Participants

Participants for this study were selected from the parent study on SCD which currently comprises 157 participants recruited from Columbia University Medical Center (CUMC). 12 participants were recruited from the Aging and Dementia Practice in the Department of Neurology, two of whom were referred to Neurology based on a memory-concern screener administered in the Columbia University Department of Obstetrics & Gynecology. The remaining participants were referred from ongoing aging studies at Taub Institute for Research on Alzheimer’s Disease and the Aging Brain at CUMC (n = 145). Referral aging studies included the Alzheimer’s Disease Research Center (n = 73), Washington Heights Inwood Columbia Aging Project (n = 35), Testing Olfaction in Primary care to detect Alzheimer’s disease and other Dementias (n = 11), Cognitive Reserve and Reference Ability Neural Network studies (n = 22), Imaging inflammation in elders with different clinical and biomarker profiles of Alzheimer’s disease (n = 2), and Concerns About Memory Problems (n = 2). To be included in the parent study, participants were required to have performed within normal limits on standard neuropsychological testing (demographically adjusted z-scores above −1.5) within the last 12 months (see Supplementary Table S1 for neuropsychological screening measures, Supplemental Digital Content 1, http://links.lww.com/WAD/A406) and have no history of neurological conditions or acute psychiatric conditions. All participants provided written consent and procedures were approved by the Columbia University Institutional Review Board. A total of 136 participants had available measures selected for the study (67.6% females; n = 92) with a mean age of 73.69 years (SD = 6.79 y) and mean education of 16.22 (SD = 2.42). Participants self-identified as White (73%, n = 99), Black (22%, n = 30), other (4%, n = 5), and Asian (1%, n = 2). A total of 6 individuals (6.9%) identified as Hispanic.

Measures

SCD Questionnaire

Participants completed an age-anchored, 20-item SCD questionnaire (ie, “Do you have difficulty with [...] compared to others your age?”). Ratings for each item ranged from 0 (—no problem to 6—major problem) summing to a total score that ranged from 0 to 120 with higher scores indicating higher SCD (see the study by Chapman et al\textsuperscript{13} for scale). Previously reported Cronbach $\alpha$ for this scale was 0.93 in line with this sample’s Cronbach $\alpha$ which was 0.94.\textsuperscript{13}

Perceptions of Age and Aging

Age Stereotypes. Age stereotypes were measured both explicitly and implicitly. Explicit age stereotypes were measured through a questionnaire consisting of 10 items that examined the extent to which participants agreed with positive or negative attributes of older adults. Each item contained opposing ends of one attribute (ie, dependent-independent) on a scale from −3 to 3, with 0 being neutral.\textsuperscript{16} Total explicit age stereotypes scale ranged from −30 to 30 with higher scores representing an endorsement of more negative explicit aging stereotypes. Cronbach $\alpha$ for this scale was 0.87 in this sample.

Implicit age stereotypes were assessed using an adapted Implicit Association Test.\textsuperscript{16,28} This computerized test assesses if participants have automatic positive or negative associations with older adults by measuring participants reaction times when forced to make such associations. The total score of the Implicit Association Test, “d′,” is derived by subtracting log-transformed “old-negative” reaction time latencies from “old-positive” reaction time latencies. A faster average response time in the “old-negative” block compared with the “old-positive” block was interpreted as an implicit preference towards negative age stereotypes. Higher $d$ values represent an increased endorsement of negative implicit stereotypes of aging.

Essentialist Beliefs About Aging. Essentialist beliefs were assessed via a 4-item scale\textsuperscript{29} which reflects a continuum of self-reported beliefs on how fixed or malleable the aging process is. Example items include “To a large extent, a person’s age biologically determines his or her abilities,” and “No matter at what point in life, you can always influence your own aging.” Each item is rated on a scale from 0 (do not agree) to 6 (absolutely agree). Two items were reversed scored, resulting in a range of 0 to 24 with higher scores indicating increased essentialist beliefs (ie, age as an irreversible and fixed process). Cronbach $\alpha$ for this scale was 0.80.\textsuperscript{14}
has been previously reported between 0.55 and 0.72\textsuperscript{29} in line with this sample’s Cronbach $\alpha$ which was 0.56.

**Subjective Age.** Felt age was measured with one item that asked participants to indicate how old they felt. Chronological age is then subtracted from felt age to generate a discrepancy score with positive scores indicating feeling older than one’s chronological age.\textsuperscript{30}

**Age Group Identification.** Age group identification was measured with two items that assessed the extent to which participants identify with “older people.” Items included “I identify with older people” and “I have a lot in common with older people.”\textsuperscript{31} Each item is rated on a scale of 1 (do not agree) to 7 (absolutely agree) with higher scores indicating greater age group identification. The total score ranged from 2 to 14. Cronbach $\alpha$ for this scale was 0.88 in this sample.

**Cognitive Functioning**

Cognitive functioning was measured with The Loewenstein-Acevedo Scales of Semantic Interference and Learning (LASSI-L).\textsuperscript{32} A recently developed list-learning test that measures susceptibility to proactive semantic inference and the ability to recover from proactive semantic interference. As part of this measure, participants are asked to read aloud a list of 15 words, List A, from three semantic categories: fruits, musical instruments, and articles of clothing. Participants are then asked to recall the items (A1) learned with the three semantic categories as cues (eg, “Can you tell me all the words on the list that were fruits?”). List A is then read again, followed by another cued recall (A2). Participants are then presented with a second list (new set of 15 words, List B) from the same semantic categories (fruits, musical instruments, and articles of clothing), followed by recall (B1, susceptibility to proactive semantic interference). Following List B participants are presented with List B again, and recall (B2, recovery from semantic interference). Immediately following B2, participants are asked to recall all of the words from List A (A3, susceptibility to retroactive semantic interference). For the purposes of this study, susceptibility to proactive interference (B1) was selected given its previous associations with biomarkers of AD such as amyloid load and AD signature volumetric loss, and its previous shown association with SCD.\textsuperscript{32,33}

**Self-reported Depressive Symptoms**

Self-reported depressive symptoms were measured via the Geriatric Depression Scale.\textsuperscript{34} This scale consists of 15 items assessing various depressive symptoms such as hopelessness, fear of the worst happening, etc. A total score for this study was computed excluding one item that asks individuals about their memory (as this would be expected to overlap with SCD). The total score ranged from 0 to 14 with higher scores indicating higher endorsement of depressive symptoms. Cronbach $\alpha$ of the Geriatric Depression Scale was 0.75 within this sample.

**Statistical Analyses**

Means and SDs are reported on participants’ demographics (age, sex, and education), questionnaires of age perceptions and SCD, and cognitive function in Table 1. Two-tailed correlations were conducted between demographics (age and education) and SCD, perceptions of aging, and depressive symptoms. Independent sample t tests were conducted to examine differences with regards to sex group. Given our hypothesis, bivariate analyses were conducted with 1-tailed Spearman correlations to examine associations between SCD and perceptions of aging. Two regression models were then conducted to examine SCD’s association with cognitive performance when first adjusting for depressive symptoms and demographics. The second regression model adjusted for depressive symptoms, demographics, and perceptions of aging. In all comparisons, statistical significance was defined at the $\alpha = 0.05$ level (ie, $P < 0.05$).

**RESULTS**

**Demographics, SCD, Perceptions of Aging, and Depressive Symptoms**

Table 1 displays the summary scores and bivariate associations for self-reported SCD, perceptions of aging, and depressive symptoms. One participant reported their felt age as 300 years which was treated as an outlier and removed from analyses. SCD was not correlated with any demographic variables. Regarding perceptions of aging, males endorsed more negative explicit age stereotypes than women ($P < 0.05$). Finally, level of education was positively associated with more negative explicit stereotypes, older subjective age and cognitive function.

As reported in Table 2, higher SCD was correlated with stronger essentialist beliefs, greater identification with older people, and more depressive symptoms. Similarly, depressive symptoms were correlated with stronger essentialist beliefs and greater identification with older people. Significant correlations were also observed between these perceptions of aging such that stronger essentialist beliefs were associated with greater identification with older people. Older subjective age was correlated with stronger essentialist beliefs about aging and identification with older people. A regression model including all age attitudes, showed no unique associations between age attitudes and SCD (Supplementary Table S2, Supplemental Digital Content 2, http://links.lww.com/WAD/A407). Finally, only SCD was significantly correlated with cognitive function.

**Regression Analyses With Cognitive Functioning as Outcome**

Table 3 summarizes the model examining SCD, depressive symptoms and demographics associating with cognitive functioning. The overall model was significant ($F_{5,122} = 8.37, P < 0.001$) and explained 25% of the cognitive outcome. Higher SCD, older chronological age, and fewer years of education were independently associated with lower cognitive scores. There was no significant association between cognitive functioning and depressive symptoms. Table 4 summarizes the results of the regression model adjusting for all perceptions of aging, demographics, and depression. The overall model was significant ($F_{7,120} = 4.27, P < 0.001$) and explained 26% of the cognitive outcome (semantic proactive interference). SCD, age, and education were associated with semantic interference. Neither age attitudes nor depressive symptoms were associated with cognitive functioning.

**DISCUSSION**

SCD is a risk factor for future cognitive decline in older adults.\textsuperscript{1,2,14} In fact, we would argue that many if not all individuals who develop AD dementia likely move through a state of SCD at some point early in their disease course.\textsuperscript{35} Increasingly, studies are revealing the utility of SCD for...
TABLE 1. Descriptives of SCD, Depressive Symptoms, Age Perceptions, and Association With Demographics Age, Education, and Sex (N = 136)

<table>
<thead>
<tr>
<th>Descriptives</th>
<th>Sample Range</th>
<th>Age Mean (SD)</th>
<th>Age r</th>
<th>Age P</th>
<th>Age CI</th>
<th>Education Mean (SD)</th>
<th>Education r</th>
<th>Education P</th>
<th>Education CI</th>
<th>Gender Mean Difference*</th>
<th>Gender P</th>
<th>Gender CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>73.69 (6.79)</td>
<td>56-92</td>
<td>0.14</td>
<td>0.10</td>
<td>-0.04</td>
<td>-0.10 (0.24) -0.27</td>
<td>0.10</td>
<td>0.97</td>
<td>-5.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>16.22 (2.42)</td>
<td>10-20</td>
<td>0.31</td>
<td>0.07</td>
<td></td>
<td>0.25 (0.004) 0.09</td>
<td>4.46</td>
<td>0.007</td>
<td>1.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex—Female</td>
<td>92 (68)</td>
<td></td>
<td>0.06</td>
<td>0.49</td>
<td>-0.23</td>
<td>0.01 (0.80) -0.04</td>
<td>0.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCD age-anchored (0-120)</td>
<td>18.82 (15.79)</td>
<td>0-60</td>
<td>-0.06</td>
<td>0.48</td>
<td>-0.22</td>
<td>0.06 (0.49) -0.23</td>
<td>0.01</td>
<td>0.80</td>
<td>-0.04</td>
<td></td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Explicit stereotypes (−30 to 30)</td>
<td>-7.01 (9.06)</td>
<td>-30 to 17</td>
<td>-0.25</td>
<td>0.25</td>
<td></td>
<td>0.25 (0.25) -0.11</td>
<td>1.06</td>
<td>0.25</td>
<td>-0.73</td>
<td></td>
<td>2.85</td>
<td></td>
</tr>
<tr>
<td>Implicit stereotypes (RTold-positive–RTold-negative)</td>
<td>0.04 (0.14)</td>
<td>-0.35 to 0.43</td>
<td>0.11</td>
<td>0.25</td>
<td></td>
<td>0.04 (0.64) -0.11</td>
<td>0.04</td>
<td>0.08</td>
<td>-0.03</td>
<td></td>
<td>0.16</td>
<td>0.59</td>
</tr>
<tr>
<td>Essentialist beliefs (0-24)</td>
<td>8.89 (4.97)</td>
<td>0-24</td>
<td>0.05</td>
<td>0.56</td>
<td>-0.11</td>
<td>0.17 (0.06) -0.00</td>
<td>0.16</td>
<td>0.59</td>
<td>-3.10</td>
<td></td>
<td>5.42</td>
<td></td>
</tr>
<tr>
<td>Subjective age (felt age—chronological age)</td>
<td>-14.21 (11.60)</td>
<td>-49 to 5</td>
<td>0.20</td>
<td>0.02</td>
<td>0.01</td>
<td>0.11 (0.21) -0.28</td>
<td>0.91</td>
<td>0.12</td>
<td>-0.24</td>
<td></td>
<td>2.06</td>
<td></td>
</tr>
<tr>
<td>Age identity</td>
<td>6.84 (3.20)</td>
<td>0-12</td>
<td>0.20</td>
<td>0.02</td>
<td>0.01</td>
<td>0.20 (0.02) 0.01</td>
<td>0.20</td>
<td>0.12</td>
<td>-0.24</td>
<td></td>
<td>1.89</td>
<td></td>
</tr>
<tr>
<td>Depressive symptoms (0-14)</td>
<td>1.25 (1.80)</td>
<td>0-10</td>
<td>-0.03</td>
<td>0.71</td>
<td>-0.21</td>
<td>0.11 (0.19) -0.27</td>
<td>0.54</td>
<td>0.11</td>
<td>-0.11</td>
<td></td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>B1 proactive interference (0-16)</td>
<td>8.82 (2.86)</td>
<td>1-15</td>
<td>-0.26</td>
<td>0.002</td>
<td>-0.42</td>
<td>0.27 (0.002) 0.10</td>
<td>-0.37</td>
<td>0.49</td>
<td>-1.40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CIs for correlations were calculated from 1000 bootstrap correlations.
Bold values indicate statistical significance.
*Mean difference between males and females. Positive values reflect larger means in men than women; negative values reflect larger mean values in women compared with men.
1m = 133 with 1 outlier removed.
CI indicates confidence interval; r, Spearman correlation coefficient; RT, reaction time; SCD, subjective cognitive decline.

detecting important imaging and cognitive markers of preclinical AD. However, subjective perceptions of cognitive decline are not always indicative of pathologic cognitive aging, and it is important to identify the factors that may contribute to SCD more broadly. This is important because it informs the circumstances under which SCD is most likely to be a marker of emerging AD, and because it allows for the identification of potentially modifiable factors that can improve perceptions of cognitive decline. Historically, while much emphasis has been placed on mood as a primary contributor to SCD, it is increasingly appreciated that both aging and other factors that can improve perceptions of cognitive decline. In a series of bivariate analyses, we first examined correlations among SCD, age perceptions, depressive symptoms, and cognition. There were a number of important findings. First, the results confirmed the well-established link between SCD and depressive symptoms. Second, results supported the idea that the different age perceptions measured in this study represented unique constructs, as several perceptions were not or only weakly correlated with the other constructs (eg, age stereotypes), and none of the correlations between perceptions exceeded a medium effect size (r = 0.40). Consistent with previous work, aging essentialism, age group identification, and subjective age were associated with one another. Bivariate analyses also revealed novel, selective correlations between SCD and aging perceptions. In particular, higher SCD was correlated with stronger beliefs that aging is a fixed and inevitable process (ie, aging essentialism) and a stronger sense of identification with older adults. These results suggest that both general beliefs about the aging process as well as perceptions about one’s own aging relate to SCD. Somewhat unexpectedly, neither subjective age nor age stereotypes (explicit and implicit) were correlated with SCD. Interestingly, depressive symptoms showed the same pattern of correlations with age perceptions. That is, depressive symptoms were most strongly correlated with aging essentialism and age group identification. The fact that SCD and depressive symptoms show the same pattern of correlations raises the possibility that depression mediates the association between SCD and depressive symptoms. This cross-sectional work may thus serve as preliminary evidence for longitudinal models designed to map the temporal pathways between these constructs. Specifying the pathways through which these constructs affect SCD, or vice versa, will likely have key repercussions as the field moves towards early nonpharmacological interventions.

Results of the first regression model bolster previous findings in our laboratory and in a growing number of studies that when measured against sensitive cognitive outcomes, SCD relates to objective cognitive performance. In a recent study, we showed that age-anchored SCD (perceptions that memory is worse than others the same age)
mapped onto three challenging memory tasks. The current study extends that finding to a fourth measure and also shows that SCD is associated with cognitive performance when adjusting for depressive symptoms. Whether or not depressive symptoms should be considered as a covariate remains unclear, as it is possible that new-onset depressive symptoms may confer increased risk for AD.44

Finally, despite the associations between certain aging perceptions and SCD, there were no bivariate associations between any aging perceptions and objective cognitive performance. Moreover, adding perceptions of aging into the regression model did not change or detract from the extent to which SCD captures cognitive performance on a task that is sensitive to preclinical AD. There are several implications of these findings. First, it appears that there is non-overlapping variance between SCD and aging perceptions versus SCD and objective cognition. Stated differently, the subjective experience of cognitive decline may reflect multiple, independent pathways of information arising from both belief systems and cognitive functioning.

The current findings raise interesting questions about the directionality of the observed associations. Ongoing longitudinal work is dedicated to clarifying the temporal dynamics and mechanisms underlying the association between SCD and age perceptions. While the current analyses were based on the premise that perceptions of aging are stable beliefs that are longstanding and may influence SCD, it’s certainly possible that higher SCD leads people to identify more with older adults and develop stronger essentialist views on aging. One might speculate that the lack of an association between SCD and subjective age might be due to the reduced number of individuals that actually endorsed feeling older than their age. The average score for subjective age was negative with only one case

| TABLE 3. Subjective Cognitive Decline (SCD), Depressive Symptoms, and Demographics Predicting Cognitive Functioning |

<table>
<thead>
<tr>
<th></th>
<th>B (SE)</th>
<th>β</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCD</td>
<td>−0.053 (0.014)</td>
<td>−0.297</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>0.057 (0.130)</td>
<td>−0.036</td>
<td>0.660</td>
</tr>
<tr>
<td>Age</td>
<td>−0.100 (0.033)</td>
<td>−0.238</td>
<td>0.003</td>
</tr>
<tr>
<td>Sex (0 = men, 1 = women)</td>
<td>0.704 (0.484)</td>
<td>0.116</td>
<td>0.148</td>
</tr>
<tr>
<td>Level of education</td>
<td>0.312 (0.096)</td>
<td>0.261</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Bold values indicate statistical significance.

| TABLE 4. Subjective Cognitive Decline (SCD), Age Perceptions, Depressive Symptoms, and Demographics Predicting Cognitive Functioning |

<table>
<thead>
<tr>
<th></th>
<th>B (SE)</th>
<th>β</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCD</td>
<td>−0.055 (0.015)</td>
<td>−0.307</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Subjective age</td>
<td>0.024 (0.022)</td>
<td>0.096</td>
<td>0.276</td>
</tr>
<tr>
<td>Age group identification</td>
<td>0.014 (0.079)</td>
<td>0.016</td>
<td>0.860</td>
</tr>
<tr>
<td>Essentialist aging beliefs</td>
<td>−0.016 (0.051)</td>
<td>−0.028</td>
<td>0.754</td>
</tr>
<tr>
<td>Explicit age stereotypes</td>
<td>0.010 (0.028)</td>
<td>0.032</td>
<td>0.717</td>
</tr>
<tr>
<td>Implicit age stereotypes</td>
<td>−0.919 (1.652)</td>
<td>−0.044</td>
<td>0.579</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>−0.087 (0.139)</td>
<td>−0.054</td>
<td>0.532</td>
</tr>
<tr>
<td>Age</td>
<td>−0.099 (0.035)</td>
<td>−0.236</td>
<td>0.005</td>
</tr>
<tr>
<td>Sex (0 = men, 1 = women)</td>
<td>0.724 (0.510)</td>
<td>0.120</td>
<td>0.158</td>
</tr>
<tr>
<td>Level of education</td>
<td>0.286 (0.103)</td>
<td>0.239</td>
<td>0.007</td>
</tr>
</tbody>
</table>

Bold values indicate statistical significance.
reporting feeling older than their age with the majority feeling their actual age or younger. This could have skewed the impact that this feeling may have on SCD. Similarly, with regards to age stereotypes, explicit stereotypes had a negative mean indicating that on average this group did not endorse strong negative stereotypes towards older adults and thus in this group, SCD might not be related to this construct.

The current study had several limitations including the fact that the sample was comprised largely of non-Hispanic Whites; the inclusion of a more diverse set of participants who might hold different cultural beliefs of aging could reveal different results and should be examined in future studies. A second limitation was a lack of a distinction between new-onset versus long-standing depressive symptoms, each of which might relate differently to SCD and age perceptions and bring more clarity to the question at hand.

To conclude, SCD relates not only to depressive symptoms but to specific perceptions of aging including essentialist aging beliefs and age group identification. Importantly, these associations do not detract from the ability of SCD to detect variability on a sensitive measure of cognitive functioning. Routine examination of SCD as part of wellness visits in older adults will create opportunities to identify early signs of cognitive dysfunction and also to address potentially modifiable perceptions about the aging process.

REFERENCES
36. Zlatar ZZ, Muniz M, Galasko D, et al. Subjective cognitive decline correlates with depression symptoms and not with


