

University of Groningen

Dynamic, Not Stable

Armenta, Bibiana M.; Scheibe, Susanne; Stroebe, Katherine; Postmes, Thomas; Van Yperen, Nico W.

Published in:
Psychology and Aging

DOI:
[10.1037/pag0000263](https://doi.org/10.1037/pag0000263)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Final author's version (accepted by publisher, after peer review)

Publication date:
2018

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Armenta, B. M., Scheibe, S., Stroebe, K., Postmes, T., & Van Yperen, N. W. (2018). Dynamic, Not Stable: Daily Variations in Subjective Age Bias and Age Group Identification Predict Daily Well-Being in Older Workers. *Psychology and Aging*, 33(4), 559-571. DOI: 10.1037/pag0000263

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Dynamic, not stable: Daily variations in subjective age bias and age group identification
predict daily well-being in older workers

Bibiana M. Armenta¹

Susanne Scheibe¹

Katherine Stroebe¹

Tom Postmes¹

Nico W. Van Yperen¹

¹University of Groningen

This is the final author version accepted at *Psychology & Aging* as of April 2, 2018. Please cite as:

Armenta, B. M., Scheibe, S., Stroebe, K., Postmes, T., & Van Yperen, N. W. (2018). Dynamic, not stable: Daily variations in subjective age bias and age group identification predict daily well-being in older workers. *Psychology and Aging, 33*, 559-571. doi:10.1037/pag0000263

Author Note

This research was supported by a grant from the Netherlands Organization for Scientific Research (NWO), project number 022.003.040. Data collection and translation to German was possible with the help of Solveig Greve, Torben Großterlinden, Julia Herrmann, Chantal Kazemi Far, Sophie Ribbers, and Büsra Dalka.

Portions of this research were presented at the 2016 Kurt Lewin Institute Conference in Zeist, The Netherlands.

Correspondence concerning this article should be addressed to Bibiana M. Armenta, who is now at the Department of Experimental and Applied Psychology, Free University of Amsterdam; Van der Boechorststraat 1, 1081 BT Amsterdam, The Netherlands, email: b.m.amentagutierrez@vu.nl, telephone: +31 20 59 84334. The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Abstract

This work examines the hypothesis that older workers' responses to negative events at work depend, in part, on daily fluctuations of subjective age bias (SAB; how old people feel compared to their actual age) and age group identification (age GI). We tested whether SAB and age GI fluctuate over time, whether they influence attributions of negative daily work events as age-related, and thereby predict older workers' daily affect and cognitive engagement in their work. A diary study with 169 older workers (aged 50-70 years) demonstrates that there are substantial daily variations in SAB and GI. Daily fluctuations of SAB and age GI respectively predicted attributions of negative personal (e.g., forgetfulness) and social (e.g., social exclusion) work events to age. Age attributions, in turn, negatively predicted affect and daily cognitive engagement over and above event occurrence. In other words, when confronted with negative daily work events, the short-term dissociation from one's chronological age and age group (i.e., feeling younger and identifying less with other older adults) seems to benefit older workers' well-being.

Keywords: Subjective age bias; group identification; age attributions; negative affect; cognitive engagement

Word count: 7943 words.

Dynamic, not stable: Daily variations in subjective age bias and age group identification predict daily well-being in older workers

Many people associate aging with negative physical and psychological changes (Palmore, 2015). In occupational settings, for example, older workers are believed to be less productive and to have a lower capacity to learn (Posthuma & Campion, 2009). Older adults not only share such negative views about aging (Hummert, Garstka, Shaner, & Strahm, 1994), but also tend to be aware that young and middle-aged adults hold negative older age stereotypes (age-based meta-stereotypes; Finkelstein, Ryan, & King, 2013). This likely affects the day-to-day work experiences as individuals join the group of older workers, such as whether or not negative events at work are interpreted as being age-related (Prohaska, Keller, Leventhal, & Leventhal, 1987). For example, a momentary memory lapse can be attributed to circumstantial reasons, such as fatigue, but as one becomes older can also be attributed to age. Similarly, being denied a professional training trajectory can be attributed to a company's lack of financial means but also to age discrimination. During the transition into older age when one's identity as an older adult is not yet fully formed, such attributions may fluctuate more than during other periods of life: what today gets attributed to circumstantial reasons tomorrow could get attributed to age. Because aging is an internal and uncontrollable aspect of the self, age attributions may be more harmful for well-being than attributions to circumstantial reasons (Lachman, 1990; Levy, Ashman, & Slade, 2009).

The present work examines both determinants and consequences of daily age attributions in older workers, a group that is receiving increasing attention in organizational research due to workforce aging (Rappaport, Bancroft, & Okum, 2003). It does so by focusing on the role of two concepts that have proven central to the experience of old age at the individual and collective level, respectively: subjective age bias (SAB)—how old people feel compared to their actual age, and age group identification (age GI)—how much people

identify with the group of older adults. SAB and age GI are typically conceptualized and measured as stable individual difference variables. We suggest it is important to study *fluctuations* in SAB and age GI at a day-to-day level. We propose such fluctuations have differential effects on age attributions in response to two types of negative daily events, those that are personal in nature (e.g., a memory lapse) and those that are social, and thereby potentially discriminatory, in nature (e.g., being left out from meetings). Moreover, we examine the role that these attributions play in predicting daily levels of affect and cognitive engagement, both of which represent key predictors of job performance (Beal, Weiss, Barros, & MacDermid, 2005; Rich, Lepine, & Crawford, 2010b).

SAB and Age GI Are Distinct and Fluctuate Daily

In the aging literature, SAB and age GI are largely seen as synonyms (Diehl & Wahl, 2010; Levy, 2003; Logan, Ward, & Spitze, 1992; but see Weiss & Lang, 2011). In fact, some scholars refer to age identification and operationalize it as SAB (Barrett, 2003; Heckhausen & Krueger, 1993; Kaufman & Elder Jr., 2002; Westerhof & Barrett, 2005). While traditionally seen as interchangeable, SAB and age GI are starting to be understood as different aspects of one's identity that can have differential consequences for well-being as people enter older age (Armenta, Stroebe, Scheibe, Postmes, & Van Yperen, 2017). This is in line with social identity theory which posits that individuals have both personal and social identities (Tajfel, 1974). Personal identities include unique attributes of an individual (e.g., forgetfulness). Social identities are derived from one's memberships in social groups, and the value attached to this membership (Brewer, 1991; Tajfel, 1982; Turner, Oakes, Haslam, & McGarty, 1994). Social identity theory further assumes that personal and social identities can vary in salience over time. The salience of these identities determines how situations are interpreted – for example, the extent to which one makes personal or group-related attributions (Major, Quinton, & Schmader, 2003).

With respect to personal aspects of identity, subjective age has proven an important construct in studying personal experiences of becoming older (Kotter-Grühn, Neupert, & Stephan, 2015). Subjective age *bias* (SAB) refers to the gap between subjective age (how old one feels) and chronological age (how old one is). This gap can be quite considerable: adults between the ages of 58-70 years report feeling on average 6 years younger than their chronological age (Teuscher, 2009). SAB is positively related to life satisfaction, positive affect, subjective health, self-efficacy, and self-esteem, and negatively to negative affect and mortality (Teuscher, 2009; Uotinen, Rantanen, & Suutama, 2005; Weiss & Lang, 2011; Westerhof & Barrett, 2005). SAB has mainly been studied as a static construct that differs between individuals (Westerhof et al., 2014). Yet there is emerging evidence that SAB fluctuates daily between the ages of 60 to 96 years (Bellingtier, Neupert, & Kotter-Grühn, 2015; Kotter-Grühn et al., 2015). These day-to-day within-person variations in SAB are substantial at 23% of the total variance (Bellingtier et al., 2015): On some days aging individuals feel considerably younger than on other days. Furthermore, experimental manipulations of subjective age demonstrate that it can be temporarily altered by situational factors (Armenta, Stroebe, Scheibe, Postmes, et al., 2017; Hughes, Geraci, & De Forreest, 2013; Stephan, Chalabaev, Kotter-Grühn, & Jaconelli, 2013).

With respect to social aspects of identity, the extent to which people feel connected to groups is related to health and psychological well-being (Jetten, Haslam, Haslam, Dingle, & Jones, 2014). GI has a certain degree of stability over time, but it can also fluctuate situationally as demonstrated by research that has manipulated levels of GI (e.g., Armenta, Stroebe, Scheibe, Van Yperen, et al., 2017). A fluctuating GI implies that the self-concept derived from the group, as well as subsequent well-being advantages (Jetten et al., 2014), may be more volatile and malleable than currently assumed. Yet, prior research has not studied short-term fluctuations of GI.

Fluctuations in SAB and age GI may be particularly visible in individuals who have not yet fully formed their identity as older adults, such as those in the transition period from middle age to old age. In this period, SAB and age GI also tend to be independent of each other (Armenta, Stroebe, Scheibe, Postmes, et al., 2017; Weiss & Lang, 2011). In line with predictions by social identity theory, we propose that fluctuations in SAB are likely to drive individual level interpretations of events, such as attributing negative personal events to age (e.g., memory loss). By contrast, fluctuations in age GI should be associated with group level interpretations of events, such as attributing social events to age (e.g., rejection).

Fluctuations in SAB and Age GI May Predict Daily Age Attributions

Aging is commonly associated with negative physical and psychological changes (Löckenhoff et al., 2009; Palmore, 2015). For example, forgetting important meetings at work may be a signal one is getting older. While transitioning from mid-life into older age (i.e., older workers between 50 and 70 years of age), it can be particularly ambiguous whether such events are due to aging. At older ages (> 70 years) such potentially more chronic experiences may be accommodated to a new accepted identity of being old, reducing ambiguity again (Sneed & Whitbourne, 2003). This raises questions about how people in the transition period from midlife into old age navigate through such events.

We propose that SAB may be an important factor in driving fluctuations in attributions of *personal* events to age (rather than seeing them as incidental). We reasoned that for adults who are entering older ages, SAB may moderate the link between the occurrence of negative age-ambiguous personal events and attributions thereof to age. Specifically, on days when older adults feel younger (larger SAB), they may be less prone to attributing negative personal events to their age than on days when they feel older (smaller SAB; Hypothesis 1a). Moreover, based on the premise that SAB is an individual process connected to personally felt changes such as affect, health and strength (Keyes & Westerhof, 2012; Kotter-Grühn et al.,

2015; Westerhof & Barrett, 2005) we assume that SAB influences personal events and not necessarily social events.

Social events, such as feeling excluded at work, raise different concerns in older workers: Is such an event attributable to discrimination against oneself as an older person? Importantly, identification with one's group (e.g., ethnic, age) is a key moderator in attributing negative outcomes to discrimination: high identifiers make more attributions to discrimination, potentially because they are more aware of discriminatory cues (Eccleston & Major, 2006; Major, Quinton, & Schmader, 2003; Operario & Fiske, 2001; but see Jetten et al., 2001). This work is based on the premise that individuals differ in their level of group identification. But what if we assume that levels of GI fluctuate within persons over time?

Although not yet tested, temporal changes in age GI are likely to influence attributions of negative social events to age. Specifically, we propose that on days where age GI is higher (i.e., people identify more with the group of older workers), older workers attribute negative social events more to their age than on days where age GI is lower (Hypothesis 1b).¹ Moreover, based on the premise that GI is associated with group level interpretations of events, we propose that GI influences social events (e.g., attributing a rejection to social discrimination), and not necessarily personal events (e.g., attributing forgetfulness to one's own aging process).

Consequences of Age Attributions for Daily Affect and Cognitive Engagement at Work

In general, negative work events have been shown to elicit negative emotions that could last until the end of the working day (Kuba & Scheibe, 2016) and even the next morning (M. Wang et al., 2013). Furthermore, negative work events also impact cognitive engagement. Cognitive engagement is defined as the capacity of being fully psychologically present at the cognitive level (Kahn, 1990) and is a key indicator of job performance and job satisfaction (Rich, Lepine, & Crawford, 2010a). Prior research found that daily stressors are

linked to impairment of daily cognitive performance especially in older adults (Sliwinski, Smyth, Hofer, & Stawski, 2006). These findings are consistent with arguments that work-unrelated thoughts, in particular those that have an emotional load, direct attention off task, while subsequently redirecting attention back to the work task exhausts cognitive resources (Beal et al., 2005).

These debilitating effects are likely enhanced when aging workers attribute events at work to their age - an internal and uncontrollable aspect of the self (Stewart, Chipperfield, Perry, & Weiner, 2012; Weiner, Perry, & Magnusson, 1988). Indeed, attributions of illness to older age are associated with poor health and increased mortality (Stewart et al., 2012). Negative self-perceptions of aging are related to feelings of emptiness, worthlessness and hopelessness (Levy, Slade et al., 2002), to an increased reactivity to daily stressors in older adults (Bellingtier & Neupert, 2016), and to mortality (Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009). Moreover, concerns that memory changes are biologically driven and inevitable, induce task-related interference and impair working memory in older adults (Jordano & Touron, 2017). Taken together these studies suggest that age-related attributions of personal events impact well-being and work performance.

Attributions of social events to age, and potentially to discrimination, also induce stress, uncertainty, and vigilance, which impair cognitive functioning (Inzlicht, McKay, & Aronson, 2006; Lamont, Swift, & Abrams, 2015; Major & O'Brien, 2005; Schmader & Johns, 2003). Moreover, concerns about being disadvantaged due to one's group membership have a negative impact on emotions, well-being, and health and decrease psychological well-being and performance at work (Mendes, Major, McCoy, & Blascovich, 2008; Pascoe & Smart Richman, 2009; Schmitt, Branscombe, Postmes, & Garcia, 2014; von Hippel, Kalokerinos, & Henry, 2012). Based on this literature, we propose that attributing negative

personal (Hypothesis 2a) and social (Hypothesis 2b) daily events to age is related to higher negative affect and lower cognitive engagement over and above event occurrence.

Taken together, we predict a path from the occurrence of personal and social daily events via age attributions to negative affect and cognitive engagement (Hypothesis 3). Additionally, we expected a moderating effect of SAB and age GI on links of negative daily event occurrence with affect and cognitive engagement via age attributions. Specifically, SAB may reduce the harmful effects of negative daily personal events by making it less likely that older workers attribute these to their age. Hence, the mediational effect of attributions to age likely varies at different levels of SAB so that on days where SAB is lower, affect and cognitive engagement will be less impaired due to fewer attributions of personal events to age (Hypothesis 4a). In contrast, age GI may enhance the harmful effects of negative daily social events by making it more likely that older workers attribute these to their age. Hence, the mediational effect of attributions to age likely varies at different levels of GI so that on days where GI is higher, affect and cognitive engagement will be more impaired due to more attributions of social events to age (Hypothesis 4b).

Method

We conducted a diary study to assess daily variability of SAB and age GI and their covariation with other constructs. Although causality cannot be claimed for non-experimental studies, diary studies have several advantages. First, they allow the testing of theories about relationships as they unfold in their natural settings making, thereby enhancing external validity (Beal, 2015; Bolger & Laurenceau, 2013). Second, diary studies comprising as few as five observations are already informative about change for a given person during a specific time interval, and—when combined across many persons—are a good representation of change for a typical person in the population studied (Bolger & Laurenceau, 2013, p. 2). Third, omitted and confounding variables are less of a problem when studying how people

change over time rather than how people differ from one another (Bolger & Laurenceau, 2013, p. 31). Further advantages are the reduction of memory and method biases (for a discussion see Beal, 2015). Consequently, studying SAB and GI in conjunction with the occurrence of negative events and their attributions to age *in real-world settings* complements traditional cross-sectional studies and laboratory experiments in important ways.

Participants

The sample included 169 currently working German participants aged 50 to 70 years recruited through word of mouth and by distributing flyers.² Participants had a mean age of 55.12 years ($SD = 4.07$) and 49.7% were female. Most participants worked full-time (76.4%); 74.6% of participants were employed while 16.4% were self-employed. The sample was quite highly educated: 61.1% had high school or higher education, and 33.8% primary or lower secondary school. Participants had diverse occupational backgrounds; the most frequent occupational sectors were education, office and administration, sales, social work, finance, and healthcare (each between 8 and 11 % of the sample). As an incentive for participation, participants received personalized feedback on their scores on SAB, age GI, number and attribution of negative events to age, and subjective well-being in comparison with other participants in the study. They also participated in a lottery for three online shopping vouchers each worth 50€

Design and Procedure

As part of a diary design, participants were asked to complete a baseline survey and short daily surveys every afternoon after work during at least 10 working days. In order to accomplish this, participants were sent daily links to the diary survey for 15 consecutive working days (Mondays to Fridays) over the course of three weeks. Some participants completed more daily surveys than required; thus the number of daily entries ranged from 1 to 15 ($M = 9.01$, $SD = 2.45$), for a total of 1.523 entries.

Participants were told that the aim of the study was to investigate work experiences in the second half of people's career, and that questions would address their daily experiences at work as well as their mood and thinking processes. The baseline survey included an informed consent, demographic questions, baseline measures of subjective age, age GI, attribution of negative events to age, negative affect, cognitive engagement, and further measures not used in this study³. Moreover, participants created a personal code that they recreated at each daily measurement so that their data could be linked while ensuring anonymity of responses. We sent a web link to the daily questionnaire to the participants' email address during the 15 working days following the baseline survey; links were valid for 24 hours. In the daily questionnaires participants reported their day-specific subjective age, age GI, occurrence of daily negative personal and social events, attributions of these events to age, negative affect, cognitive engagement, and other measures not used in this study.³ After study completion, participants were sent a link to a webpage with personalized feedback, which could be retrieved by a personal code.

Measures⁴

Daily age GI. Daily identification with older workers was assessed with a slight modification of the single-item scale validated by Postmes, Haslam, and Jans (2012): "Today, I identify with the group of older workers". The scale ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores indicate higher age GI.

Daily SAB. *Subjective age* was assessed with the item: "How old do you feel today?", which has been used in multiple prior studies (e.g. Bellintier et al., 2015). *Subjective age bias* was calculated by subtracting subjective age from participants' chronological age. Higher values indicate that respondents feel younger relative to their chronological age. In line with earlier studies, participants reported feeling younger than their actual age on most days (72%

of days across all participants), reported feeling exactly their age on 21% of days, and reported feeling older than their actual age on only 7% of days.

Number of personal and social events. We asked participants to indicate whether they had experienced five negative personal events (“I made an error, or forgot something when completing a work task”, “I was sick, had physical pain or discomfort [e.g., headache, stomachache, backache]”, “I had a hard time learning new things”, “I could not put an idea into action”, “I had a technically related problem [e.g., PC or other work tools]”) and five negative social events (“I was left out from meetings with colleagues”, “I was not given job-related information”, “I was assigned to too many different tasks or to tasks that were not solvable”, “I was treated poorly by a supervisor, colleague or customer”, “I was denied opportunities for personal and professional development”) that day at work. The list of events was derived from a taxonomy of negative work events (Ohly & Schmitt, 2013) and from items used to assess age discrimination (Bayl-Smith & Griffin, 2014; James, Lovato, & Cropanzano, 1994). Every event that occurred was counted as 1; we summed the number of personal and social events separately so that the maximum possible score of each type of event per day was 5.

Daily attributions of negative events to age. For every personal and social event endorsed for a given day, we asked participants to rate whether this event was due to their age. The scale ranged from 0 (*event did not occur or event was not at all related to my age*), to 4 (*event was very much related to my age*). We summed the scores so that higher scores indicate a stronger attribution of events to age, either personal or social.

Negative affect. We assessed negative affect by asking participants to rate the extent to which they had felt *angry, irritable, hostile, sad, blue, and downhearted* that day while at work, from 1 (*not at all*) to 5 (*extremely*). The measure was derived from the PANAS-X scale

(Watson & Clark, 1994). We aggregated items so that higher scores indicate higher negative affect. Reliability of the scale at the within-person level was good ($\omega = .74$).⁵

Daily cognitive engagement. We assessed cognitive engagement by asking participants to rate to what extent they had felt *attentive*, *absorbed*, *uninvolved*, *detached*, and *distracted* that day while at work, from 1 (*not at all*) to 5 (*extremely*). The measure was developed based on Kahn (1990) who assessed cognitive engagement qualitatively using these five words in his interviews. We reverse-coded the last three items and then aggregated items so that higher scores indicate higher cognitive engagement. Reliability at the within-person level was relatively low ($\omega = .52$).

Analytic Approach

Given that our data consisted of daily reports that were nested within persons, we used random-coefficient multilevel modeling (Muthén, Muthén, & Asparouhov, 2015) to test the hypotheses. Random-coefficient multilevel modeling accounts for the fact that both intercepts and slopes may vary across individuals (e.g., the relationship between event occurrence and age attributions may differ from one older worker to the next). We tested all hypotheses simultaneously with multilevel path analysis, via a multilevel structural equation modeling (MSEM) approach using Mplus 7 (Muthén & Muthén, 2015). This enabled us to estimate Hypotheses 1 to 4 at the within-person level simultaneously. We used Bayesian estimation as is recommended for MSEM (Hox, Moerbeek, Kluytmans, & van de Schoot, 2014).

Prior to running the model, we decomposed the predictor variables (i.e., occurrence of personal/social events, SAB, and age GI) into their within-person and between-person level components, also known as person-mean centering. We grand-mean centered the between-level variables. This methodology has several advantages, (1) it prevents a confounding of within- and between-person level effects (Bolger & Laurenceau, 2013); (2) it treats both levels of a given variable as different variables that are not necessarily related; (3) it enables

one to define the interaction effects in advance and enter them as predictors in the model. To decompose the predictor variables, we calculated each participant's mean and subtracted it from the participant's raw score on the respective variable. We then conducted the multilevel analysis with the within-person deviations as predictors. We controlled for time (day in study) at the within-person level; however, time did not predict any variable except cognitive engagement ($\beta = 0.006$, $p = 0.020$). Note that this renders it unlikely that the study procedures affected our results by increasing the salience of age for participants. We controlled for age and gender at the between-person level (we only found an effect of gender on cognitive engagement, with lower engagement scores for men compared to women; $\beta = -0.15$, $p = 0.020$). As is common in the field, we report unstandardized coefficients from the MSEM. We probed significant moderation effects via asymptotic z-tests for simple intercepts at low and high levels of the moderator (Preacher, Curran, & Bauer, 2006).

Results

Preliminary Analyses

Means, standard deviations, intraclass correlations, reliabilities, and correlations between within-person level and between-person level variables are shown in Table 1. Intraclass-correlation coefficients (ICC) varied between 14% and 74%, indicating that a significant proportion of variance (between 26% and 86%) was located at the within-person level. The average number of negative personal events per day was 1 ($SD = 1.07$). Of the sample, 93% reported at least one personal event and 63% reported at least one social event across the study period. Personal events occurred on 58% of days. The average number of personal events on these days was 1.7 ($SD = 0.87$). The average ratings of attribution of personal events to age was 0.56 ($SD = 1.09$), with personal events or attributions of these events to age on 29% of days. The average rating of attribution of personal events to age on the days when personal events occurred was 0.93 ($SD = 1.3$). The average number of social

events per day was 0.38 ($SD=0.76$). Social events occurred on 25% of days. The average number of social events on these days was 1.5 ($SD=1.78$). The average ratings of attribution of social events to age was 0.08 ($SD=0.40$), with social events or attributions of these events to age on 5% of days. The average rating of attribution of social events to age on the days when social events occurred was 0.32 ($SD=0.74$). These statistics suggest that age attributions are relatively rare in daily work life, especially with regard to social, potentially discriminatory, events. Nevertheless, due to the large number of daily samples ($N = 1523$), our data included 884 days with personal age-related events and 379 days with social age-related events.

Interestingly, we found a negative correlation between age and number of negative events (both personal $r = -.18, p = .009$, and social, $r = -.26, p < .001$) which indicates that the older these working participants were, the fewer negative events they reported across all study days. Surprisingly, we also found a negative correlation between age and attributions of social events to age, $r = -.17, p = .019$, indicating that the older the participant the less they attributed negative social events to age. Age and negative affect showed a negative correlation, $r = -.18, p = .01$, indicating that the older the participant the less they reported negative affect. Age was unrelated to cognitive engagement, $r = -.02, p = .719$. Finally, age GI and SAB showed moderate correlations both at the day-level, $r = -.24, p < .001$, and at the person-level, $r = -.33, p < .001$; which supports their separate consideration in our research model.

The Moderating Role of SAB: From Occurrence of Negative Events to Negative Affect and Cognitive Engagement

We tested all hypotheses in the same model which is shown in Figure 1; for parameter estimates and their corresponding standard deviations and confidence intervals see Table 2. Results of the within-person MSEM model show that the more negative personal events

occurred on a given day the more attributions of these events to age were made, $\beta_1 = 0.47, p < .001$. Importantly, in line with Hypothesis 1a, the strength of this relationship was moderated by daily SAB ($\beta_{15} = -0.02, p = .020$). Thus, on days where SAB was lower (i.e., people felt older) people reported a stronger link between occurrence of negative personal events and attributions of these events to age than on days where SAB was higher (i.e., they felt younger). To illustrate, Figure 2 shows the relationship between attributions of personal events to age and occurrence of personal events at low (20th percentile) and high (80th percentile) levels of daily SAB. At low levels of daily SAB, the slope was 0.51, $z = 16.67, p < .001$. At high levels of daily SAB, the slope was 0.44, $z = 16.35, p < .001$. Overall, the model explained 26% of the within-person variance in personal age attributions.⁶

In support of Hypothesis 2a and 2b, attributions of negative personal events to age in turn related to higher negative affect, $\beta_{11} = 0.03, p = .010$, and lower cognitive engagement, $\beta_{16} = -0.07, p < .001$. Moreover, in support of Hypothesis 3, attributions to age mediated the relationship between occurrence of negative personal events and negative affect (indirect effect: $\beta_{19} = 0.01, p = .010$) and cognitive engagement (indirect effect: $\beta_{20} = -0.03, p < .001$). Furthermore, conform Hypothesis 4a, the indirect effect of personal events on negative affect through attributions to age depended on the level of daily SAB, $\beta_{23} = -0.001, p = .030$, as did the indirect effect of personal events on cognitive engagement through attributions to age, $\beta_{24} = 0.002, p = .020$.

Importantly, SAB did not moderate the relationship between occurrence of *social* events and attributions of these events to age, $\beta_{17} = 0.01, p = .180$. In other words, daily SAB was associated with daily cognitive engagement via attributions of personal events to age, but not via attributions of social events to age.

The Moderating Role of Age GI: From Occurrence of Negative Events to Negative Affect and Cognitive Engagement

Results of the within-person MSEM model show that the more negative social events occurred on a given day the more attributions of these events to age were made, $\beta_4 = .24, p < .001$. Importantly, in line with Hypothesis 1b, the strength of this relationship was moderated by daily age GI ($\beta_{18} = 0.09, p < .001$). Thus, on days where age GI was higher (i.e., people identified more with the group of older workers) people reported a stronger link between occurrence of negative social events and attributions of these events to age than on days where age GI was lower (i.e., people identified less with the group of older workers). To illustrate, Figure 3 shows the relationship between attributions of social events to age and occurrence of social events at low (20th percentile) and high (80th percentile) levels of daily age GI. At low levels of daily age GI, the slope was 0.19, $z = 11.33, p < .001$. At high levels of daily age GI, the slope was 0.28, $z = 15.27, p < .001$. The model explained 17% of the variance in social age attributions.

In support of Hypothesis 2a and 2b, attributions of negative social events to age, in turn, were positively related to negative affect, $\beta_{13} = 0.07, p = .030$, and negatively to cognitive engagement, $\beta_{14} = -0.08, p = .020$. Moreover, in support of Hypothesis 3, attributions to age mediated the relationship between occurrence of negative social events and negative affect (indirect effect: $\beta_{21} = 0.02, p = .030$), and cognitive engagement (indirect effect: $\beta_{22} = -0.02, p = .020$). Furthermore, as stated in Hypothesis 4b, the indirect effect of social events on negative affect through attributions to age depended on the level of daily age GI, $\beta_{29} = 0.005, p = .030$. Similarly, the indirect effect of social events on cognitive engagement through attributions to age depended on the level of daily age GI, $\beta_{30} = -0.006, p = .020$. Overall, the model explained 9% of the within-person variance in negative affect and 4% of the variance in cognitive engagement.⁶

Importantly, age GI did not moderate the relationship between occurrence of *personal* events and attributions of these events to age, $\beta_{16} = 0.01, p = .590$. In other words, daily age GI related to daily negative affect and cognitive engagement via attributions of social events to age, but not via attributions of personal events to age.

Additional Analyses

Thus far, we modelled SAB and age GI as moderators of the relationship between event occurrence and age attributions. However, it is also possible that on days on which negative events get attributed to age, workers feel older and/or identify more with the group of older workers than on days that such events are not attributed to age (for related research linking daily stressors to SAB in adults aged 60 to 96 years, see Bellingtier, et al., 2015). Clarifying the constellation of relationships is important for deriving practical implications of our work (e.g. should interventions focus on modifying aspects of age identity or age attributions). We therefore tested an alternative model with the two types of events and their age attributions interactively predicting SAB and age GI, which in turn predict negative affect and attentional focus. As in the original model we accounted for time, age, and gender. None of the four interaction effects (personal events x personal age attribution and social events x social age attribution predicting either SAB or age GI) reached significance (all $ps > .10$). In this model, SAB was negatively predicted by personal ($\beta = -0.78, p = .001$) and social ($\beta = -0.50, p = .02$) age attributions, but not by the occurrence of either personal or social events themselves ($p > .10$). Age GI was positively predicted by both personal event occurrence ($\beta = 0.08, p = .037$) and attribution of such events to age ($\beta = 0.12, p = .041$), but neither by social event occurrence nor attribution of such events to age (both $ps > .10$). SAB, in turn, predicted lower negative affect ($\beta = -0.015, p = .002$) and higher cognitive engagement ($\beta = 0.023, p = .003$); while age GI predicted higher negative affect ($\beta = 0.025, p = .009$) but did not predict cognitive engagement ($p > .10$). The lack of moderation effects between event occurrence and

age attributions in predicting SAB or age GI fail to support a process whereby age attributions moderate the association between event occurrence and aspects of age identity (the alternative model) as opposed to a process whereby aspects of age identity moderate the association between event occurrence and age attributions (our original model).

Another possibility is that SAB and age GI do not only moderate the paths from event occurrence to age attributions (as proposed in our model) but also the paths from age attributions to daily work outcomes. Specifically, harmful effects of age attributions could be enhanced when people feel older (i.e. have a lower SAB) and/or identify more with the group of older adults (for a related finding see Neupert & Bellinger, 2017). In another supplementary analysis we therefore added to our original model four interaction effects (SAB and age GI crossed with either personal or social age attributions predicting work outcomes). For *negative affect* as outcome, social age attributions interacted with both SAB ($\beta = -0.019, p = .010$) and age GI ($\beta = 0.065, p = .010$). This suggests that social age attributions have less harmful effects on negative affect on days on which participants feel younger, but have more harmful effects on days on which participants identify more with the group of older workers. For *cognitive engagement* as outcome, only the interaction between personal age attributions and SAB was significant ($\beta = 0.009, p = .001$). It indicates that personal age attributions have less harmful effects on cognitive engagement on days on which participants feel younger. These findings show that daily individual and collective identities have a dual effect on older workers' daily well-being, boosting both age attributions as well as their harmful effects for well-being.

Discussion

The transition to older age is often associated with cognitive, physical, and status loss as well as the uncertainty of whether events, such as forgetting that meeting at work, can be attributed to age. The present work focused on the flexibility that comes with this life period

on a daily basis: When do older workers attribute personal (e.g., forgetting) and social (e.g., not being invited to a meeting) events to age? And how do these attributions affect levels of well-being? In understanding the flexible nature of these processes, we examined how fluctuations in older age identity—how old one feels personally (SAB) and the extent to which one feels connected to the group of older adults (age GI)—would affect these personal and social attributions respectively.

The results provided evidence for daily variability in SAB and age GI. Indeed, a significant proportion of variance in SAB (33%) and age GI (26%) was located at the within-person level. These daily fluctuations of SAB and age GI predicted subsequent age-related attributions, respectively predicting attributions of negative personal (e.g., forgetfulness) and social (e.g., ill-treatment) daily work events to age. Notably, such attributions to social events potentially contain an element of discrimination: the negative behavior (e.g. exclusion, lack of promotion) is elicited by another person supposedly due to one's own age. Both personal and social attributions to age, in turn, negatively predicted affect and cognitive engagement in older workers. Note however that the moderated mediation effects on work outcomes may be relatively small, based on the (conservative) criterion of explained within-person variance (9% and 4% of negative affect and cognitive engagement, respectively).

The present research approach of considering *fluctuations in SAB and age GI* complements a long tradition of studying SAB and GI as stable individual properties. To our knowledge this is the first empirical study to focus on GI as a variable that is subject to daily fluctuations. This conception of GI as fluid (which is consistent with the idea that social identity can be more or less salient across situations) implies that known consequences of GI for well-being (Jetten et al., 2014), intergroup attitudes and behaviors (e.g., discrimination; Tajfel, 1982) may be subject to similar fluctuations. In addition, our results contribute to emerging research suggesting that the apparent stability of SAB may be veiled by daily

variations thereof (Bellintier et al., 2015; Kotter-Grühn et al., 2015). Whereas previous work has focused on SAB as an outcome of daily negative stressors (Bellintier et al., 2015), the present study reveals that fluctuations in SAB play an important role in interpreting the nature of daily stressors: are they age-related or not? In sum, given the considerable within-person variance of these constructs, our work suggests that an exclusive between-person approach to SAB and to GI may be incomplete.

The present work has several theoretical and practical implications. At the theoretical level, it suggests that SAB and age GI should be considered as two separate concepts. Indeed, it is not the case that someone who feels very connected to older people is more likely to attribute personal events, such as forgetting something, to his or her age – yet he or she is more likely to attribute social events, such as being excluded from a meeting, to age. Conversely, someone who feels older is not more likely to attribute social events to age, but is more likely to think that forgetting a meeting is due to his/her age. In other words, SAB and GI should not be considered as two sides of the same coin (cf. Heckhausen & Krueger, 1993; Kaufman & Elder Jr., 2002; Westerhof & Barrett, 2005). Rather, it is important to study the impact of these concepts separately. This is befitting of the social identity tradition that distinguishes individual and collective identities (Brewer, 1991; Tajfel, 1982; Turner et al., 1994). In line with this reasoning, SAB may be seen as referring to aspects of a personal identity and subsequent interpretation of personal events whereas GI refers to one's collective identity and subsequent interpretations of social events.

Furthermore, in relation to the known complexity of GI with a stigmatized group for well-being (Branscombe, Schmitt, & Harvey, 1999; McCoy & Major, 2003) we found evidence of a path by which identifying with the group of older workers may indirectly have a negative impact on well-being because it means that negative social events can be attributed to one's group membership. Although it has been argued at the between-person level that such

attributions can be self-protective (albeit under certain conditions, e.g., when discrimination is not considered pervasive; McCoy & Major, 2003; Stroebe, Dovidio, Barreto, Ellemers, & John, 2011), at the within-person level we find that attributions of social events to age negatively impact affect and cognitive engagement. Yet, it is possible that despite the immediate negative consequences of these attributions for well-being, down the line high identifiers may be better prepared to fight stigma than low identifiers by developing coping mechanisms at an early stage (see also K. Wang, Stroebe, & Dovidio, 2012).

A similar case can be raised for people who feel older. Our results showed that at the within-person level feeling older may indirectly have a negative impact on well-being because negative personal events are more likely to be attributed to one's age. In the long-term, however, one may wonder whether feeling younger than one's age is beneficial for people's well-being: It could indicate that older adults have internalized cultural attitudes that being old is an undesirable state and therefore try to deny their own aging (Gendron, Inker, & Welleford, 2017). As such, it may prevent older adults from adjusting to their aging by accommodating a concrete self-definition as an older person. Indeed, research shows that a balance between accommodating a new identity (i.e., allowing new experiences to shape one's identity) and assimilating an existent identity (i.e., ignoring discrepant experiences to maintain the current identity) is the most adaptive identity process (Sneed & Whitbourne, 2003).

At the practical level, our findings substantiate the hypothesis that daily negative work events and age attributions have a negative impact on affect and cognitive engagement, both of which are important predictors of job performance (Beal et al., 2005; Rich et al., 2010a). It is therefore important for organizations to become aware that lower levels of job performance and well-being of older employees could partly be prevented by reinforcing an atmosphere which promotes a positive view towards aging. Organizational interventions may for example

enhance awareness of implicit age bias in leaders and teams, organize expert lectures on aging at work, or make decision-makers accountable for their older-worker stereotypes (Paluck & Green, 2009). At the same time, it is important for individuals to be aware that how old they feel and how much they identify with the group of older workers on a given day can affect their daily age attributions. This may compel them to reflect on the objectivity of such age attributions, which is especially important when the cause of attributing negative experiences to age is biased such as an automatic association between “old” and “bad” (Prohaska et al., 1987; Stewart et al., 2012). After all, research has shown that age per se is not the principal cause of illness and that most of the negative stereotypes of older workers are inaccurate (Ng & Feldman, 2012; Stewart et al., 2012).

Limitations and Future Directions

A limitation of the current study is that its design does not allow for claims of causality. A closer approximation to causal claims from a daily diary methodology would require that the potential predictor and outcome are measured closer in time to be able to explore order and time delay between them, and to avoid potential confounding variables. However, this may diminish the potential for fluctuations in SAB and age GI and increase the chance that participants become habituated to questions and responses. For this reason, and guided by previous research finding fluctuations in SAB at a daily level (Bellintier et al., 2015; Kotter-Grühn et al., 2015), we assessed these concepts at the daily level rather than more frequently. This means that based on the present results, we cannot be sure that SAB and age GI precede age attributions. Note however that our supplementary analyses ruled out the possibility that age attributions serve as moderator in predicting aspects of age identity. Relatedly, we cannot be sure that age attributions precede well-being outcomes. Yet, evidence—which includes experimental studies—is compelling regarding the causal claims of age attributions affecting well-being (e.g., Lamont et al., 2015; Stewart et al., 2012). This

study complements prior research in this respect with the advantage that it offers good external validity (Beal, 2015).

Another limitation is that we obtained only a ‘snapshot’ of daily experiences in the period that adults normatively transition from midlife into older age (roughly at the age of 60, see Lachman, Teshale, & Agrigoroaei, 2015). Thus, we did not track people over longer time intervals to test whether daily experiences actually change as workers get older and undergo this transition. Future research that tracks people longitudinally, for example with measurement burst designs that comprise repeated diary studies across several years (Ram & Gerstorf, 2009), is needed to test this issue more fully.

Furthermore, participants from our sample experienced few days with negative social events (about one in four days) of which very few were attributed to age (about one in five days with social events). We found this an interesting outcome. Does this mean that social events are less noticed and even less attributed to age than are personal events? Or did our sample experience fewer negative social than personal events at work and attribute them less to age – perhaps because they were highly educated or representative of a less youth-oriented culture (i.e., Germany)? To analyze this phenomenon, future research could include a sample from an environment where instances of age discrimination are potentially more frequent, or could compare environments that differ in valuations of older ages. For instance, cross-cultural comparisons could allow for interesting conclusions regarding the nature and protective value of SAB and age GI if their well-being effects replicate in age discriminatory cultures but not in more age-egalitarian cultures. Indeed, a comparison study between Germany and the United States showed that feeling younger has more well-being advantages in a more youth-oriented culture (i.e., the United States; Westerhof & Barrett, 2005). Alternatively, the low number of social daily events could be due to the nature of the work our current sample engaged in (although note that the sample worked in a variety of work

environments). Unfortunately, we did not collect information on work demands, such as the amount of team work or interactions with external clients; this remains a task for future research.

A final limitation is the relatively low reliability of our cognitive engagement measure at the within-person level (though the reliability at the between-person level was satisfactory, see Table 1). The measurement of daily cognitive engagement will need to be improved in future research to more accurately capture this work outcome.

Our work focused on the role of fluctuations in SAB and age GI in attributing daily events at work to age. This is an important step to understanding what shapes age-related attributions at work. Yet, it raises the question of what determines such fluctuations in SAB and age GI at the daily level. At present little is known about potential causes of daily variability in SAB and GI. This is an important avenue for future research. On the one hand, SAB is hypothesized to change along with fluctuations in health and daily stressors (Bellinzier et al., 2015; Kotter-Grühn et al., 2015). However, no research so far has established causal evidence for such associations. In our supplementary analyses, we found little evidence that daily SAB and age GI are predicted by daily events after accounting for age attributions. An event-based sampling approach would be useful to further examine the effect of daily events on aspects of age identity. On the other hand, experimental research at the between-person level suggests various possible determinants of GI, such as the perceived permeability of group boundaries, and the stability and legitimacy of the group's status position (Ellemers, Van Knippenberg, & Wilke, 1990; Ellemers, Wilke, & Van Knippenberg, 1993). However, these contextual factors are unlikely to fluctuate daily and the underlying question of what increases group identification in natural settings has yet to be answered. Future research can profit from investigating whether the perceptions of such contextual

factors can fluctuate in the short-term and if they cause people's GI daily variations in natural settings.

Conclusion

Overall, our findings suggest that feeling younger and disidentifying with the group of older workers offer advantages for older workers' short-term well-being: On days when older workers felt younger and identified less with the group of older workers they attributed negative age-ambiguous events less to their age than on days when they felt older and identified more with the group of older workers. Age attributions were in turn coupled with higher negative affect and reduced cognitive engagement. Findings further contribute to the aging and intergroup relations literatures by showing that SAB and age GI have considerable variability at the day level and differentially moderate age attributions of different types of events (personal versus social). This underscores the advantages of studying SAB and age GI separately to fully understand the well-being consequences of individual and collective aspects of older workers' identity.

References

- Armenta, B. M., Stroebe, K., Scheibe, S., Postmes, T., & Van Yperen, N. W. (2017). Feeling younger and identifying with older adults: Testing two routes to maintaining well-being in the face of age discrimination. *PLoS ONE*, *12*(11), e0187805.
<https://doi.org/https://doi.org/10.1371/journal.pone.0187805>
- Armenta, B. M., Stroebe, K., Scheibe, S., Van Yperen, N. W., Stegeman, A., & Postmes, T. (2017). Permeability of group boundaries: Development of the concept and a scale. *Personality and Social Psychology Bulletin*, *43*(3), 418–433.
<https://doi.org/10.1177/0146167216688202>
- Barrett, A. E. (2003). Socioeconomic status and age identity: The role of dimensions of health in the subjective construction of age. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *58*(2), S101–S109.
<https://doi.org/10.1093/geronb/58.2.S101>
- Bayl-Smith, P. H., & Griffin, B. (2014). Age discrimination in the workplace: identifying as a late-career worker and its relationship with engagement and intended retirement age. *Journal of Applied Social Psychology*, *44*(9), 588–599.
<https://doi.org/10.1111/jasp.12251>
- Beal, D. J. (2015). ESM 2.0: State of the art and future potential of experience sampling methods in organizational research. *Annual Review of Organizational Psychology and Organizational Behavior*, *2*, 383–407. <https://doi.org/10.1146/annurev-orgpsych-032414-111335>
- Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology*, *90*(6), 1054–1068. <https://doi.org/10.1037/0021-9010.90.6.1054>
- Bellingtier, J. A., & Neupert, S. D. (2016). Negative aging attitudes predict greater reactivity

- to daily stressors in older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 0(0), 1–5. <https://doi.org/10.1093/geronb/gbw086>
- Bellingtier, J. A., Neupert, S. D., & Kotter-Grühn, D. (2015). The combined effects of daily stressors and major life events on daily subjective ages. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 0(0), 1–10. <https://doi.org/10.1093/geronb/gbv101>
- Bolger, N., & Laurenceau, J.-P. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research*. New York: The Guilford Press.
- Branscombe, N. R., Schmitt, M. T., & Harvey, R. D. (1999). Perceiving pervasive discrimination among African Americans: Implications for group identification and well-being. *Journal of Personality and Social Psychology*, 77(1), 135–149. <https://doi.org/10.1037/0022-3514.77.1.135>
- Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, 17(5), 475–482. <https://doi.org/10.1177/0146167291175001>
- Diehl, M., & Wahl, H. (2010). Awareness of age-related change: Examination of a (mostly) unexplored concept. *Journal of Gerontology: Social Sciences*, 65B(3), 340–350. <https://doi.org/10.1093/geronb/gbp110>
- Eccleston, C. P., & Major, B. (2006). Attributions to discrimination and self-esteem: The role of group identification and appraisals. *Group Processes & Intergroup Relations*, 9(2), 147–162. <https://doi.org/10.1177/1368430206062074>
- Ellemers, N., Van Knippenberg, A., & Wilke, H. (1990). The influence of permeability of group boundaries and stability of group status on strategies of individual mobility and social change. *The British Journal of Social Psychology*, 29, 233–246. <https://doi.org/http://dx.doi.org/10.1111/j.2044-8309.1990.tb00902.x>

- Ellemers, N., Wilke, H., & Van Knippenberg, A. (1993). Effects of the legitimacy of low group or individual status on individual and collective status-enhancement strategies. *Journal of Personality and Social Psychology*, *64*(5), 766–778.
<https://doi.org/http://dx.doi.org/10.1037/0022-3514.64.5.766>
- Finkelstein, L. M., Ryan, K. M., & King, E. B. (2013). What do the young (old) people think of me? Content and accuracy of age-based metastereotypes. *European Journal of Work and Organizational Psychology*, *22*(September 2014), 633–657.
<https://doi.org/10.1080/1359432X.2012.673279>
- Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods*, *19*(1), 72–91.
<https://doi.org/10.1037/a0032138>
- Gendron, T. L., Inker, J., & Welleford, A. (2017). “How Old Do You Feel?” The Difficulties and Ethics of Operationalizing Subjective Age. *The Gerontologist*, *0*(0), 1–7.
<https://doi.org/10.1093/geront/gnx098>
- Heckhausen, J., & Krueger, J. (1993). Developmental expectations for the self and most other people: Age grading in three functions of social comparison. *Developmental Psychology*, *29*(3), 539–548. <https://doi.org/10.1037/0012-1649.29.3.539>
- Hox, J., Moerbeek, M., Kluytmans, A., & van de Schoot, R. (2014). Analyzing indirect effects in cluster randomized trials. The effect of estimation method, number of groups and group sizes on accuracy and power. *Frontiers in Psychology*, *5*(FEB), 1–7.
<https://doi.org/10.3389/fpsyg.2014.00078>
- Hughes, M. L., Geraci, L., & De Forrest, R. L. (2013). Aging 5 years in 5 minutes: The effect of taking a memory test on older adults’ subjective age. *Psychological Science*, *24*(12), 2481–8. <https://doi.org/10.1177/0956797613494853>
- Hummert, M. L., Garstka, T. A., Shaner, J. L., & Strahm, S. (1994). Stereotypes of the elderly

- held by young, middle-aged, and elderly adults. *Journal of Gerontology*, 49(5), P240-9.
Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/8056949>
- Inzlicht, M., McKay, L., & Aronson, J. (2006). Stigma as ego depletion: How being the target of prejudice affects self-control. *Psychological Science*, 17(3), 262–9.
<https://doi.org/10.1111/j.1467-9280.2006.01695.x>
- James, K., Lovato, C., & Cropanzano, R. (1994). Correlational and known-group comparison validation of a workplace prejudice/discrimination inventory. *Journal of Applied Social Psychology*, 24, 1573–1592. <https://doi.org/10.1111/j.1559-1816.1994.tb01563.x>
- Jetten, J., Branscombe, N. R., Schmitt, M. T., & Spears, R. (2001). Rebels with a cause: Group identification as a response to perceived discrimination from the mainstream. *Personality and Social Psychology Bulletin*, 27(9), 1204–1213.
<https://doi.org/10.1177/0146167201279012>
- Jetten, J., Haslam, C., Haslam, S. A., Dingle, G., & Jones, J. M. (2014). How groups affect our health and well-being: The path from theory to policy. *Social Issues and Policy Review*, 8(1), 103–130. <https://doi.org/10.1111/sipr.12003>
- Jordano, M. L., & Touron, D. R. (2017). Stereotype threat as a trigger of mind-wandering in older adults. *Psychology and Aging*, Advance online publication.
<https://doi.org/http://dx.doi.org/10.1037/pag0000167>
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692–724. <https://doi.org/10.2307/256287>
- Kaufman, G., & Elder Jr., G. H. (2002). Revisiting age identity. A research note. *Journal of Aging Studies*, 16, 169–176. [https://doi.org/http://dx.doi.org/10.1016/S0890-4065\(02\)00042-7](https://doi.org/http://dx.doi.org/10.1016/S0890-4065(02)00042-7)
- Keyes, C. L. M., & Westerhof, G. J. (2012). Chronological and subjective age differences in flourishing mental health and major depressive episode. *Aging & Mental Health*, 16(1),

67–74. <https://doi.org/10.1080/13607863.2011.596811>

Kotter-Grühn, D., Kleinspehn-Ammerlahn, A., Gerstorf, D., & Smith, J. (2009). Self-Perceptions of aging predict mortality and change with approaching death: 16-year longitudinal results from the Berlin aging study. *Psychology and Aging, 24*(3), 654–667. <https://doi.org/10.1037/a0016510>

Kotter-Grühn, D., Neupert, S. D., & Stephan, Y. (2015). Feeling old today? Daily health, stressors, and affect explain day-to-day variability in subjective age. *Psychology & Health, 30*(12), 1470–1485. <https://doi.org/10.1080/08870446.2015.1061130>

Kuba, K., & Scheibe, S. (2016). Let it be and keep on going! Acceptance and daily occupational well-being in relation to negative work events. *Journal of Occupational Health Psychology, 21*(1), 1–12. <https://doi.org/10.1037/a0040149>

Lachman, M. E. (1990). When bad things happen to older people: Age differences in attributional style. *Psychology and Aging, 5*(4), 607–9. <https://doi.org/10.1037//0882-7974.5.4.607>

Lachman, M. E., Teshale, S., & Agrigoroaei, S. (2015). Midlife as a pivotal period in the life course: Balancing growth and decline at the crossroads of youth and old age. *International Journal of Behavioral Development, 39*(1), 20–31. <https://doi.org/10.1177/0165025414533223>

Lamont, R. A., Swift, H. J., & Abrams, D. (2015). A review and meta-analysis of age-based stereotype threat: Negative stereotypes, not facts, do the damage. *Psychology and Aging, 30*(1), 180–193. <https://doi.org/10.1037/a0038586>

Levy, B. R. (2003). Mind matters: Cognitive and physical effects of aging self-stereotypes. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 58*(4), P203–P211. <https://doi.org/10.1093/geronb/58.4.P203>

Levy, B. R., Ashman, O., & Slade, M. D. (2009). Age attributions and aging health: Contrast

- between the United States and Japan. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 64(3), 335–338. <https://doi.org/10.1093/geronb/gbp002>
- Löckenhoff, C. E., Fruyt, F. De, Terracciano, A., McCrae, R. R., Bolle, M. De, Costa, P. T., ... Barbaranelli, C. (2009). Perceptions of Aging across 26 Cultures and their Culture-Level Associates. *Psychology and Aging*, 24(4), 941–954. <https://doi.org/doi-org.proxy-ub.rug.nl/10.1093/geronb/gbv079>
- Logan, J. R., Ward, R., & Spitze, G. (1992). As old as you feel: Age identity in middle and later life. *Social Forces*, 71(2), 451–467.
<https://doi.org/http://dx.doi.org/10.1093/sf/71.2.451>
- Major, B., & O'Brien, L. T. (2005). The social psychology of stigma. *Annual Review of Psychology*, 56, 393–421. <https://doi.org/10.1146/annurev.psych.56.091103.070137>
- Major, B., Quinton, W. J., & Schmader, T. (2003). Attributions to discrimination and self-esteem: Impact of group identification and situational ambiguity. *Journal of Experimental Social Psychology*, 39(3), 220–231. [https://doi.org/10.1016/S0022-1031\(02\)00547-4](https://doi.org/10.1016/S0022-1031(02)00547-4)
- McCoy, S. K., & Major, B. (2003). Group identification moderates emotional responses to perceived prejudice. *Personality and Social Psychology Bulletin*, 29(8), 1005–17.
<https://doi.org/10.1177/0146167203253466>
- Mendes, W. B., Major, B., McCoy, S. K., & Blascovich, J. (2008). How attributional ambiguity shapes physiological and emotional responses to social rejection and acceptance. *Journal of Personality and Social Psychology*, 94(2), 278–91.
<https://doi.org/10.1037/0022-3514.94.2.278>
- Muthén, B. O., Muthén, L. K., & Asparouhov, T. (2015). *Random coefficient regression*. Retrieved from
https://www.statmodel.com/download/Random_coefficient_regression.pdf

- Muthén, L. K., & Muthén, B. O. (2015). *Mplus user's guide* (Seventh). Los Angeles, CA.
- Nezlek, J. B. (2012). Multilevel modeling analyses of diary-style data. In R. Mehl & T. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 357–383). New York: Guilford Press.
- Ng, T. W. H., & Feldman, D. C. (2012). Evaluating six common stereotypes about older workers with meta-analytical data. *Personnel Psychology*, *65*(4), 821–858.
<https://doi.org/10.1111/peps.12003>
- Ohly, S., & Schmitt, A. (2013). What makes us enthusiastic, angry, feeling at rest or worried? Development and validation of an affective work events taxonomy using concept mapping methodology. *Journal of Business and Psychology*, 1–21.
<https://doi.org/10.1007/s10869-013-9328-3>
- Operario, D., & Fiske, S. T. (2001). Ethnic identity moderates perceptions of prejudice: Judgments of personal versus group discrimination and subtle versus blatant bias. *Personality and Social Psychology Bulletin*, *27*(5), 550–561.
<https://doi.org/10.1177/0146167201275004>
- Palmore, E. B. (2015). Ageism comes of age. *The Journals of Gerontology: Series B*, *70*(6), 873–875. <https://doi.org/https://doi-org.proxy-ub.rug.nl/10.1093/geronb/gbv079>
- Paluck, E. L., & Green, D. P. (2009). Prejudice reduction: What works? A review and assessment of research and practice. *Annual Review of Psychology*, *60*(1), 339–367.
<https://doi.org/10.1146/annurev.psych.60.110707.163607>
- Pascoe, E. a., & Smart Richman, L. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin*, *135*(4), 531–554.
<https://doi.org/10.1037/a0016059>
- Posthuma, R. A., & Campion, M. A. (2009). Age stereotypes in the workplace: Common stereotypes, moderators, and future research directions. *Journal of Management*, *35*(1),

158–188. <https://doi.org/10.1177/0149206308318617>

Postmes, T., Haslam, S. A., & Jans, L. (2012). A single-item measure of social identification: Reliability, validity, and utility. *The British Journal of Social Psychology, 52*, 597–617.

<https://doi.org/10.1111/bjso.12006>

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics, 31*(4), 437–448.

<https://doi.org/10.3102/10769986031004437>

Prohaska, T. R., Keller, M. L., Leventhal, E. A., & Leventhal, H. (1987). Impact of symptoms and aging attribution on emotions and coping. *Health Psychology, 6*(6), 495–514.

Ram, N., & Gerstorf, D. (2009). Time-structured and net intraindividual variability: Tools for examining the development of dynamic characteristics and processes. *Psychology and Aging, 24*(4), 778–791. <https://doi.org/10.1037/a0017915>

Rappaport, A., Bancroft, E., & Okum, L. (2003). The aging workforce raises new talent management issues for employers. *Journal of Organizational Excellence, 23*, 55–66.

<https://doi.org/10.1002/npr.10101>

Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010a). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal, 53*(3), 617–635.

<https://doi.org/10.5465/amj.2010.51468988>

Rich, B. L., Lepine, J. a, & Crawford, E. R. (2010b). Job engagement: antecedents and effects on job performance. *Academy of Management Journal, 53*(3), 617–635.

<https://doi.org/10.5465/amj.2010.51468988>

Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of Personality and Social Psychology, 85*(3), 440–452. <https://doi.org/10.1037/0022-3514.85.3.440>

- Schmitt, M. T., Branscombe, N. R., Postmes, T., & Garcia, A. (2014). The consequences of perceived discrimination for psychological well-being: A meta-analytic review. *Psychological Bulletin, 140*(4), 921–948. <https://doi.org/10.1037/a0035754>
- Sliwinski, M. J., Smyth, J. M., Hofer, S. M., & Stawski, R. S. (2006). Intraindividual coupling of daily stress and cognition. *Psychology and Aging, 21*(3), 545–557. <https://doi.org/10.1037/0882-7974.21.3.545>.Intraindividual
- Sneed, J. R., & Whitbourne, S. K. (2003). Identity processing and self-consciousness in middle and later adulthood. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 58*(6), P313–P319. <https://doi.org/10.1093/geronb/58.6.P313>
- Stephan, Y., Chalabaev, A., Kotter-Grühn, D., & Jaconelli, A. (2013). “Feeling younger, being stronger”: An experimental study of subjective age and physical functioning among older adults. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences, 68*(1), 1–7. <https://doi.org/10.1093/geronb/gbs037>
- Stewart, T. L., Chipperfield, J. G., Perry, R. P., & Weiner, B. (2012). Attributing illness to “old age:” Consequences of a self-directed stereotype for health and mortality. *Psychology and Health, 27*(8), 881–97. <https://doi.org/10.1080/08870446.2011.630735>
- Stroebe, K., Dovidio, J. F., Barreto, M., Ellemers, N., & John, M.-S. (2011). Is the world a just place? Countering the negative consequences of pervasive discrimination by affirming the world as just. *British Journal of Social Psychology, 50*, 484–500. <https://doi.org/10.1348/014466610X523057>
- Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information, 13*(2), 65–93. <https://doi.org/10.1177/053901847401300204>
- Tajfel, H. (1982). Social psychology of intergroup relations. *Annual Review of Psychology, 33*, 1–39. <https://doi.org/10.1146/annurev.ps.33.020182.000245>

- Teuscher, U. (2009). Subjective age bias: A motivational and information processing approach. *International Journal of Behavioral Development, 33*(1), 22–31.
<https://doi.org/10.1177/0165025408099487>
- Turner, J. C., Oakes, P. J., Haslam, S. A., & McGarty, C. (1994). Self and collective: Cognition and social context. *Personality and Social Psychology Bulletin, 20*(5), 454–463. <https://doi.org/10.1177/0146167294205002>
- Uotinen, V., Rantanen, T., & Suutama, T. (2005). Perceived age as a predictor of old age mortality: A 13-year prospective study. *Age and Ageing, 34*(4), 368–372.
<https://doi.org/10.1093/ageing/afi091>
- von Hippel, C., Kalokerinos, E. K., & Henry, J. D. (2012). Stereotype threat among older employees: Relationship with job attitudes and turnover intentions. *Psychology and Aging, 28*(1), 17–27. <https://doi.org/10.1037/a0029825>
- Wang, K., Stroebe, K., & Dovidio, J. F. (2012). Stigma consciousness and prejudice ambiguity: Can it be adaptive to perceive the world as biased? *Personality and Individual Differences, 53*(3), 241–245. <https://doi.org/10.1016/j.paid.2012.03.021>
- Wang, M., Liu, S., Liao, H., Gong, Y., Kammeyer-Mueller, J., & Shi, J. (2013). Can't get it out of my mind: Employee rumination after customer mistreatment and negative mood in the next morning. *The Journal of Applied Psychology, 98*(6), 989–1004.
<https://doi.org/10.1037/a0033656>
- Watson, D., & Clark, L. A. (1994). *The PANAS-X: Manual for the positive and negative affect schedule-expanded form*. Iowa. Retrieved from
http://ir.uiowa.edu/cgi/viewcontent.cgi?article=1011&context=psychology_pubs
- Weiner, B., Perry, R. P., & Magnusson, J. (1988). An attributional analysis of reactions to stigmas. *Journal of Personality and Social Psychology, 55*(5), 738–748.
- Weiss, D., & Lang, F. R. (2011). “They” are old but “I” feel younger: Age-group dissociation

as a self-protective strategy in old age. *Psychology and Aging*, 27(1), 153–163.

<https://doi.org/10.1037/a0024887>

Westerhof, G. J., & Barrett, A. E. (2005). Age identity and subjective well-being: A comparison of the United States and Germany. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 60(3), S129–S136.

<https://doi.org/10.1093/geronb/60.3.S129>

Westerhof, G. J., Miche, M., Brothers, A. F., Barrett, A. E., Diehl, M., Montepare, J. M., & Wurm, S. (2014). The influence of subjective aging on health and longevity: A meta-analysis of longitudinal data. *Psychology and Aging*, 29(4), 793–802.

<https://doi.org/10.1037/a0038016>

Footnotes

¹ Note that some daily events that workers encounter can be of a mixed personal-social nature. For example, in the context of team work, low performance could be due to personal failure (being slow) and social, potentially discriminatory behavior (not receiving all relevant information). However, for the purpose of this study, we are focusing on events that can be clearly classified as either personal or social in nature.

² Ethical clearance was provided by the University of Groningen for research project number ppo-014-212.

³ We included a measure of perceived permeability of group boundaries in the baseline survey. Furthermore, a number of outcome measures were included in both the baseline and daily questionnaires: fatigue, self-esteem, and subjective health. Although a model that includes these outcomes offer similar results as the one presented here for negative affect and cognitive engagement, we decided not to include all these outcomes for simplicity and clarity of the model.

⁴ We adopted the back-translation method for all scales that were not validated in German.

⁵ Composite reliability or coefficient omega (ω) uses multilevel confirmatory factor analysis to measure the reliability of multi-item scales to assess within-person change and is the preferred method for estimating multilevel reliability (Bolger & Laurenceau, 2013; Geldhof, Preacher, & Zyphur, 2014). It represents the ratio of a scale's estimated true score variance relative to its total variance (Bolger & Laurenceau, 2013, Equation 7.9, p. 138).

⁶ The amount of explained variance was computed by subtracting the residual within-person variance in the final model from the within-person variance in a baseline model without any predictors, divided by the variance in the baseline model (Nezlek, 2012). Note however that this is a conservative estimation because not all significant Level-1 predictors necessarily decrease Level-1 residual variance (for details see Nezlek, 2012).

Table 1

Means, Standard Deviations, ICCs, Reliabilities (Diagonal), and Intercorrelations of Day-Level Variables (Below Diagonal) and Person-Level Variables (Above Diagonal)

Variable	<i>M</i>	<i>SD</i>	ICC	1	2	3	4	5	6	7	8	9	10
Day-level (Level 1)													
1 Number of personal events	1.00	1.07	.45	--	.68***	-.18*	.07	.75***	.60***	.64***	-.44***	-.18**	-.03
2 Number of social events	0.38	.76	.39	.02	--	-.14 [†]	.01	.41***	.71***	.65***	-.29***	-.26***	-.05
3 SAB	5.10	5.92	.67	-.13***	-.10**	--	-.33***	-.27***	-.12	-.10	-.13	.17*	.07
4 Age GI	3.80	1.85	.74	.12**	.08*	-.24***	--	.18**	.11	.02	-.02	.30***	.01
5 Personal attributions to age	0.56	1.09	.47	.49***	.07 [†]	-.21***	.14***	--	.69***	.67***	-.33***	-.08	-.01
6 Social attributions to age	0.08	0.40	.14	.03	.39***	-.07	.08*	.08	--	.73***	-.37***	-.17*	-.07
7 Negative affect	1.22	0.40	.40	.15***	.27***	-.22***	.15***	.15***	.18**	(.74/.95)	-.48***	-.18*	-.05
8 Cognitive engagement	4.23	0.56	.56	-.14***	-.09**	.23***	-.08**	-.19***	-.11*	-.20***	(.52/.88)	-.02	-.17*
Person-level (Level 2)													
9 Age	55.12	4.06	--									--	.10
10 Gender ^a	0.50	0.5	--										--

Note. Level 1 *N* = 1523; Level 2 *N* = 169. SAB = Subjective Age Bias. Age GI = Identification with the group of older workers. ICC = Proportion of variance at the person-level. Reliability estimates (ω ; Bolger & Laurenceau, 2013 p. 138) are shown in parentheses along the diagonal; the first value refers to the day-level (Level 1), the second refers to the person-level (Level 2). ^a 0 = female, 1 = male. [†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2

Bayesian Unstandardized Coefficients of the MSEM Model for Testing Main, Moderation, and Mediation Effects on Outcome Variables

Effect type	Coefficient	SD	95% CI
Within-person effects			
Slopes			
β_1 : Personal events \rightarrow Personal attributions	0.47***	0.03	[0.42, 0.52]
β_2 : Personal events \rightarrow Negative affect	0.04***	0.01	[0.02, 0.06]
β_3 : Personal events \rightarrow Cognitive engagement	-0.03*	0.02	[-0.06, -0.00]
β_4 : Social events \rightarrow Social attributions	0.24***	0.02	[0.20, 0.27]
β_5 : Social events \rightarrow Negative affect	0.12***	0.02	[0.09, 0.15]
β_6 : Social events \rightarrow Cognitive engagement	-0.02†	0.02	[-0.06, 0.00]
β_7 : SAB \rightarrow Personal attributions	-0.03***	0.01	[-0.04, -0.02]
β_8 : SAB \rightarrow Social attributions	-0.00	0.00	[-0.01, 0.00]
β_9 : Age GI \rightarrow Personal attributions	0.04*	0.02	[0.00, 0.08]
β_{10} : Age GI \rightarrow Social attributions	0.01	0.01	[-0.01, 0.03]
β_{11} : Personal attributions \rightarrow Negative affect	0.03*	0.01	[0.01, 0.05]
β_{12} : Personal attributions \rightarrow Cognitive engagement	-0.07***	0.01	[-0.10, -0.05]
β_{13} : Social attributions \rightarrow Negative affect	0.07*	0.03	[0.00, 0.11]
β_{14} : Social attributions \rightarrow Cognitive engagement	-0.08*	0.03	[-0.13, -0.01]
Moderation paths			
β_{15} : Personal events x SAB \rightarrow Personal attributions	-0.02*	0.01	[-0.04, -0.01]
β_{16} : Personal events x Age GI \rightarrow Personal attributions	0.01	0.02	[-0.04, 0.06]
β_{17} : Social events x SAB \rightarrow Social attributions	0.01	0.00	[-0.00, 0.01]

β_{18} : Social events x Age GI \rightarrow Social attributions	0.09***	0.02	[0.06, 0.11]
Indirect effects (mediation paths)			
β_{19} : Personal events \rightarrow Personal attributions \rightarrow Negative affect	0.01*	0.01	[0.00, 0.03]
β_{20} : Personal events \rightarrow Personal attributions \rightarrow Cognitive engagement	-0.03***	0.01	[-0.05, -0.02]
β_{21} : Social events \rightarrow Social attributions \rightarrow Negative affect	0.02*	0.01	[0.00, 0.03]
β_{22} : Social events \rightarrow Social attributions \rightarrow Cognitive engagement	-0.02*	0.01	[-0.03, -0.00]
Indirect effects (moderated mediation)			
β_{23} : Personal events x SAB \rightarrow Personal attributions \rightarrow Negative affect	-0.00*	0.00	[-0.001, 0.000]
β_{24} : Personal events x SAB \rightarrow Personal attributions \rightarrow Cognitive engagement	0.00*	0.00	[0.000, 0.003]
β_{25} : Personal events x Age GI \rightarrow Personal attributions \rightarrow Negative affect	0.00	0.00	[-0.001, 0.002]
β_{26} : Personal events x Age GI \rightarrow Personal attributions \rightarrow Cognitive engagement	-0.00	0.00	[-0.004, 0.002]
β_{27} : Social events x SAB \rightarrow Social attributions \rightarrow Negative affect	0.00	0.00	[0.000, 0.001]
β_{28} : Social events x SAB \rightarrow Social attributions \rightarrow Cognitive engagement	0.00	0.00	[-0.002, 0.000]
β_{29} : Social events x Age GI \rightarrow Social attributions \rightarrow Negative affect	0.01*	0.00	[0.000, 0.011]
β_{30} : Social events x Age GI \rightarrow Social attributions \rightarrow Cognitive engagement	-0.01*	0.00	[-0.013, -0.001]
Residual variances			
Social attributions	0.03***	0.00	[0.02, 0.04]
Personal attributions	0.62***	0.08	[0.49, 0.81]
Negative affect	0.07***	0.01	[0.05, 0.09]
Cognitive engagement	0.18***	0.02	[0.14, 0.23]

Note. Level 1 $N = 1523$; Level 2 $N = 169$. Personal attributions = Attributions of negative personal events to age; Social attributions = Attributions of negative social events to age; SAB = Subjective Age Bias; Age GI = Identification with the group of older workers; CI = confidence interval. We accounted for day (Level 1), age, and gender (both Level 2) effects (not shown in the table).

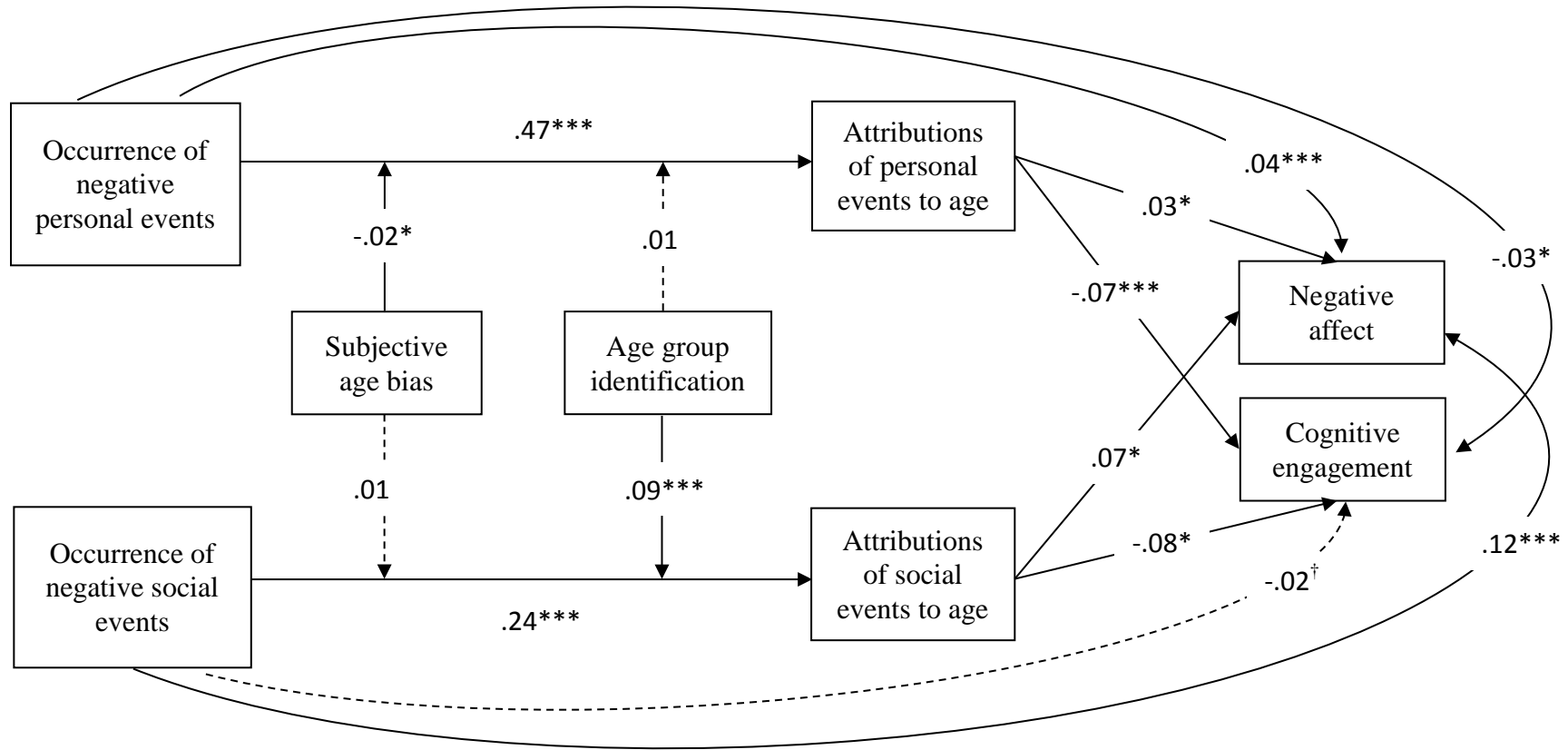


Figure 1. Multilevel structural equation model with unstandardized coefficient estimates at the within-person level. Dotted lines represent non-significant relationships at the .05 level. $^\dagger p < .10$; $* p < .05$; $** p < .01$; $*** p < .001$.

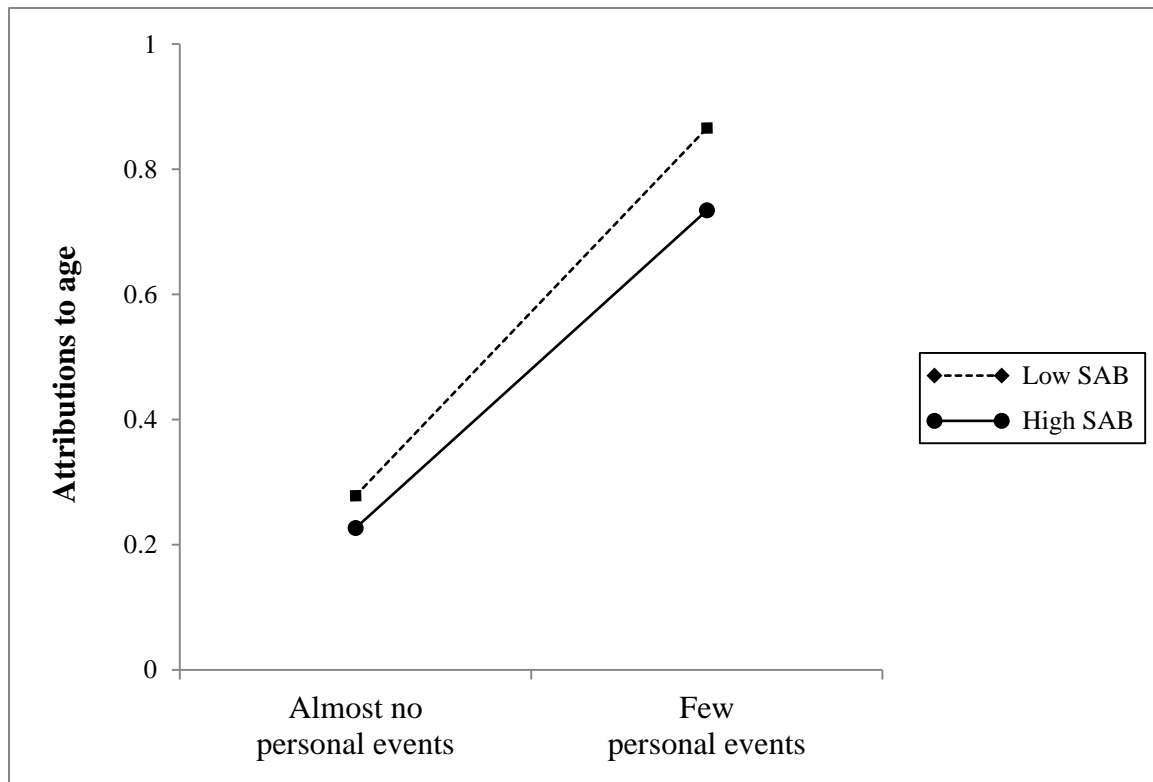


Figure 2. Interaction effect of subjective age bias (SAB) on the relationship between occurrence of negative personal events and attributions of these events to age at the within-person level. Low SAB/almost no personal events and high SAB/few personal events refer to the 20th and 80th percentile of the variable respectively.

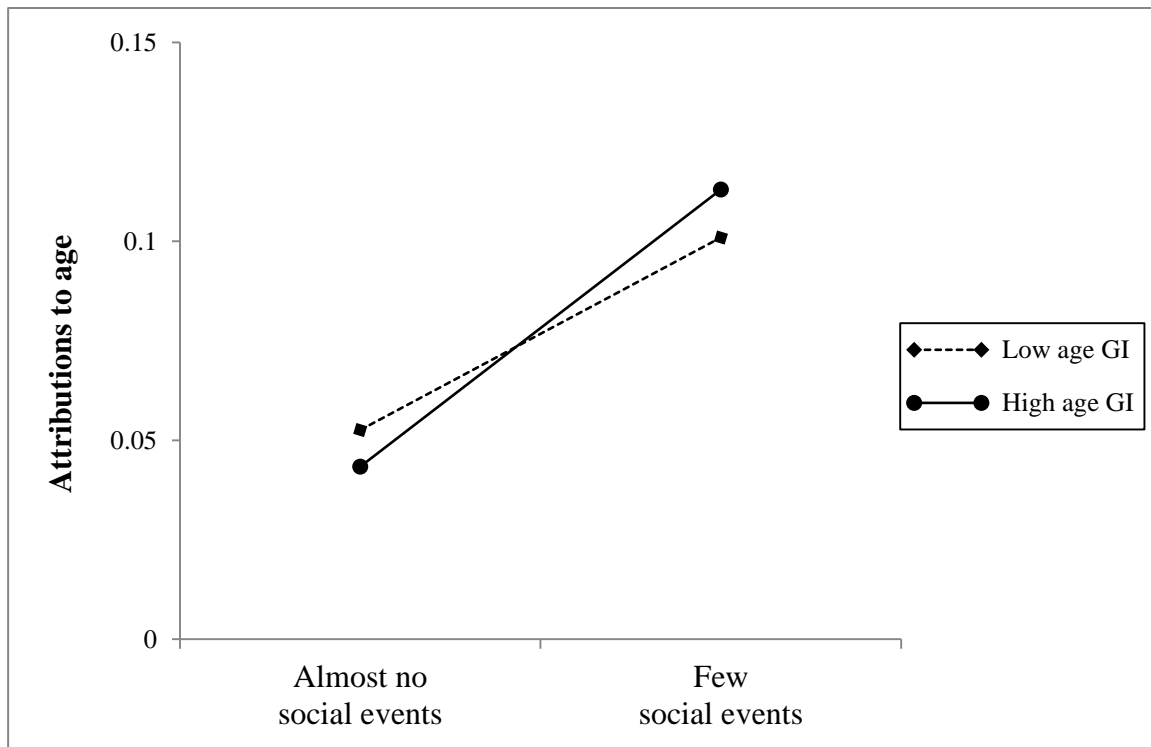


Figure 3. Interaction effect of age group identification (age GI) on the relationship between occurrence of negative social events and attributions of these events to age at the within-person level. Low age GI/almost no social events and high age GI/few social events refer to the 20th and 80th percentile of the variable respectively.