Daily Experiences of Subjective Age Discordance and Well-Being

Jennifer A. Bellingtier[1], Fiona S. Rupprecht[2], Shevaun D. Neupert[3], and Frieder R. Lang[2]

[1]Department of Developmental Psychology, Friedrich Schiller University Jena

[2]Institute of Psychogerontology, Friedrich-Alexander University of Erlangen-Nuremberg

[3]Department of Psychology, North Carolina State University

Author Note

Jennifer A. Bellingtier https://orcid.org/0000-0001-5105-0153

Fiona S. Rupprecht https://orcid.org/0000-0002-3547-0497

Shevaun D. Neupert https://orcid.org/0000-0001-5994-3060

Frieder R. Lang https://orcid.org/0000-0002-2660-1619

This work was supported by a Scholarship and Research Award to Shevaun D. Neupert from the College of Humanities and Social Sciences at North Carolina State University. Jennifer A. Bellingtier was supported by a grant to support junior researchers from Friedrich Schiller University Jena. Fiona S. Rupprecht and Frieder R. Lang were supported by the Volkswagen Foundation with grants Az 93 273 and Az 93 273-2. We have no conflicts of interest to disclose.

The authors would like to thank Yuval Palgi and Amit Shrira whose invitation to the workshop “Age- and death-related perceptions and their relationship with health” at the University of Haifa, Israel, brought us together and precipitated our collaboration on this project.

The data used in this study come from the Mindfulness and Anticipatory Coping Everyday (MACE) daily diary study (Bellingtier & Neupert, 2019, 2020; Neupert & Bellingtier, 2017, 2019; Neupert et al., 2019).

Correspondence concerning this article should be addressed to Jennifer A. Bellingtier, Department of Developmental Psychology, Friedrich Schiller University Jena, Am Steiger 3, Haus 1, 07743 Jena, Germany. Email: Jennifer.Bellingtier@uni-jena.de

Abstract

Subjective age discordance (SAD) captures the difference between how old one feels and how old one would ideally like to be. We investigated the presence, strength, and fluctuation of this discordance in daily life as well as its relationship to various indicators of physical and psychological well-being with an eight-day diary study. Participants were 116 older and 107 younger adults who completed daily measures of felt age, ideal age, positive and negative affect, physical symptoms, and stressors. We operationalized SAD as felt age minus ideal age divided by chronological age and compared the utility of this discordance to the more established proportional discrepancy of felt age from chronological age. Daily subjective age discordance was present in both age groups, such that individuals idealized younger ages than they felt. This discordance was larger in older than younger adults, although younger adults exhibited more daily fluctuations in SAD. Within-person increases in SAD were associated with lower positive affect, whereas larger SAD at the between-person level was associated with more physical symptoms and stressors. These relationships were over and above the associations of felt and chronological age with the outcomes suggesting the utility of daily subjective age discordance for understanding daily physical and psychological well-being.

Keywords: subjective aging, aging ideals, well-being, physical health

Daily Experiences of Subjective Age Discordance and Well-Being

Individuals encounter different and variable aging experiences in everyday life (e.g., physical sensations or feelings of dependency; Miche, Wahl, et al., 2014). In accordance, evaluations of the personal aging process such as the age an individual feels (i.e., felt age) and the age an individual would ideally like to be (i.e., ideal age) fluctuate across days and contexts (e.g., Armenta et al., 2018; Bellingtier et al., 2017; Shrira et al., 2020). Previous research has mainly investigated felt age, ideal age, and their fluctuations against the reference point of chronological age, specifically, to what degree individuals feel and wish to be younger or older than they objectively are (Bodner et al., 2021; Kotter-Grühn et al., 2016). However, felt age and ideal age also forge a discrepancy to each other, that is, a discrepancy between feelings and perceptions of age on the one side and ideals and desires regarding age on the other. This discrepancy has recently been labeled as *subjective age discordance* (SAD; Rupprecht & Lang, 2020). The present research focuses on the extent of subjective age discordance in daily life, its day-to-day fluctuations, and its relation to different indicators of physical and psychological well-being.

Felt Age and Ideal Age

The age an individual feels, and its antecedents and consequences, has stimulated much research over the past decades (Barrett & Montepare, 2015; Brothers et al., 2017; Kastenbaum et al., 1972). Traditionally, felt age has been investigated in relation to chronological age (e.g., Galambos et al., 2005; Stephan et al., 2015). In this vein, most middle-aged and older adults feel younger than their chronological age (Chopik et al., 2018; Pinquart & Wahl, 2021; Rubin & Berntsen, 2006). Furthermore, feeling younger than one's chronological age has been linked to favorable outcomes such as better physical health and cognitive functioning (Stephan et al., 2014; Westerhof et al., 2014). Using chronological age as the primary reference point for felt age has allowed for an understanding of self-perceptions of aging (i.e., felt age) against the backdrop of probable aging processes, social

roles and expectations, as well as age and cohort identities (Barrett & Montepare, 2015; Stephan et al., 2015; Weiss & Lang, 2009). In order to enrich the research on felt age and the subjective aging process, it may however be crucial to interpret and investigate felt age in the scope of alternative constructs carrying different information. Ideal age presents such an alternative reference point as it carries information about aging ideals and desires rather than objective aging processes (e.g., Galambos et al., 2003).

In prior research, average ideal ages have been consistently lower than average felt ages (e.g., Bellingtier et al., 2017; Kaufman & Elder, 2002) with most individuals experiencing a discordance between a younger ideal age and an older felt age (Rupprecht & Lang, 2020; Uotinen et al., 2006). Despite some claims that ideal age and felt age might be facets of the same underlying construct (i.e., subjective age), research clearly indicates that felt age and ideal age relate differently to health and psychological well-being (e.g., Hubley & Russel, 2009; Ward, 2010). For example, younger felt ages are associated with flourishing mental health, whereas younger ideal ages show the inverse association (Keyes & Westerhof, 2012). Such findings underline the importance of investigating felt age in relation to ideal age, that is, whether individuals feel as young or old as they would like to be or whether they experience a discordance between the age they feel to be and the age they would prefer to be.

On a daily level—which is the focus of this study—both felt age and ideal age exhibit considerable intraindividual variability, the latter somewhat less than the former (Bellingtier et al., 2017). Both constructs are hence influenced by the varying contexts of daily life. Hereby, some contexts seem to affect felt age and ideal age simultaneously. In an experimental study by Kotter-Grühn and Hess (2012), the confrontation with negative age stereotypes, for example, lead to older felt ages and younger ideal ages. Other contexts might specifically influence fluctuations in one of the two constructs. Felt age should be more immediately affected by aging experiences and perceptions in daily life (e.g., the varying experience of age-related gains and losses; Miche, Wahl, et al., 2014; Neupert & Bellingtier,

2017). Ideal age should, however, depend more strongly on the varying accessibility, salience, and intensity of enduring ideals (cf. Higgins, 1987). Additionally, the two constructs might influence each other. Feeling or wishing to be a certain age could elicit or emphasize certain aging ideals and perceptions. Taken together, whenever ideal age and felt age fluctuate dependently or independently from each other, subjective age discordance forms, disappears, and varies in strength. Investigating subjective age discordance in a daily diary study thus allows for understanding such fluctuations in subjective age discordance and their covariation with contextual variables such as physical and psychological well-being.

Subjective Age Discordance

Subjective age discordance is conceptually linked to *self-discrepancy theory* (Higgins, 1987). This theory describes how different representations of oneself (perceived self-states, ideal self-states, as well as ought self-states) can differ from each other and forge discrepancies and discordances regarding the self. These discordances are thought to come with an array of motivational and affective consequences (Higgins, 1987; Mason et al., 2019). The discordance between ideal age and felt or perceived age can be seen as a discrepancy between perceived and ideal states of the aging self (Rupprecht & Lang, 2020). Ideal age hereby arises from ideal self-states remembered or expected for a certain age, such as youth, freedom, economic success, or health (e.g., Barker & Galambos, 2005). A discordance between individuals' ideal ages and felt ages might hence reflect a discordance in ideal and currently perceived characteristics, capabilities, and opportunities of the aging self (Rupprecht & Lang, 2020). Subjective age discordance thus reflects an expression of dissatisfaction with the current aging process and a consequence of low psychological well-being (Rupprecht & Lang, 2020; Uotinen et al., 2006) and the associated desire for an alternate state (Luhmann & Hennecke, 2017).

Not only across longer periods of time (Rupprecht & Lang, 2020), but also in everyday life, subjective age discordance might hence be associated with lower well-being.

Self-discrepancy theory would argue that the presence of discordances between perceived and ideal self-states leads to a lower psychological well-being rather immediately (e.g., dissatisfaction, sadness, decreased joviality and self-assurance; Barnett et al., 2018; Higgins, 1987). However, the relationship may be bidirectional, as prior research has found an influence of lower well-being on the presence and strength of subjective age discordance over time (Rupprecht & Lang, 2020). Specifically, the presence of negative states, be it high negative or low positive affect, stressors, or physical symptoms might not only be associated with older felt ages (Kotter-Grühn et al., 2015), but might also increase the salience of (aging) ideals and stimulate the wish for a different age or time, ultimately leading to a stronger subjective age discordance. Taken together, we thus expect subjective age discordance to exhibit considerable intraindividual variability on a day-to-day basis and to covary with aspects of well-being, that is, physical symptoms, positive affect, negative affect, and the experience of stressors.

Subjective Age Discordance and Chronological Age

Subjective aging clearly changes over the course of life (Miche, Elsässer et al., 2014; Rubin & Berntsen, 2006). Subjective age discordance as one such aspect of subjective aging appears to show increases as individuals grow older (Rupprecht & Lang, 2020). That is, felt age and ideal age seem to become more discordant from each other over the life course (also see Chopik et al., 2018). This is of particular relevance against the backdrop of theoretical models predicting that perceived and ideal self-states align more closely as individuals age (Ryff, 1991). The age-differential composition of the current study allows for testing and validating that subjective age discordance is stronger among older than younger adults in everyday life as well.

Along with the actual presence and strength of individuals' subjective age discordances, its intraindividual variability might also differ between age groups. For example, one could argue that aging experiences and ideals might be more salient and

manifest for older adults than for younger adults whose subjective aging might depend more strongly on varying contexts and situations (Bellingtier & Neupert, 2019). In regard to self-discrepancy theory, the ideal age and state is likely in the future for younger adults, whereas the ideal has likely already been experienced by older adults. There may be less stability in the desire for an imagined age in one's future, as opposed to possible ideal ages that have already been experienced. Thus, whereas the subjective age discordance of older adults might express more stability, the one of younger adults might be rather flexible. Lastly, testing for age-differential associations between subjective age discordance and well-being should allow for a deeper understanding of the everyday concomitants of subjective age discordance in different age groups.

The Current Study

The current study investigates subjective age discordance in a daily diary study covering eight consecutive days and focusing on the two age groups of older adults and younger adults. The first goal of our study was to investigate the presence, strength, and variation of subjective age discordance in daily life for younger and older adults. Our second goal was to examine its covariation with day-to-day contextual variables, specifically positive affect, negative affect, stressors, and physical symptoms. Lastly, we sought to compare the utility and relationships of subjective age discordance with the ones of felt age, which has been the primary focus of subjective aging research in the past. In particular, we directly compare the traditional method of the discrepancy between felt age and chronological age, and its covariation, to the discrepancy between felt age and ideal age (i.e., subjective age discordance).

Method

Participants and Procedure

Participants were part of the Mindfulness and Anticipatory Coping Everyday (MACE) daily diary study (Bellingtier & Neupert, 2019, 2020; Neupert & Bellingtier, 2017, 2019;

Neupert et al., 2019), which used an extreme age groups design to collect information on the variables of interest. Both age groups completed the daily protocol online via Qualtrics, but recruitment differed across the two groups. Older adults (n = 116) were recruited via Amazon's Mechanical Turk via two separate task requests: one for the first day survey, which also served to verify participants' ages, and one for Days 2 through 9 (for a general discussion of daily diary study designs in mTurk see Neupert & Bellingtier, 2018). Participants who were over age 60 and had not been previously told by a doctor that they had dementia or mild cognitive impairment were qualified to complete Days 2 through 9. Participants completed the study in April and May of 2016 and were compensated one dollar per study day completed. Younger adults (n = 107) were recruited from introductory psychology courses via a single online experiment sign-up in exchange for partial course credit. They completed the study in October and November of 2016. This study was approved by the institutional review board at North Carolina State University.

Older adult participants were aged 60 to 90 years (M = 64.71, SD = 4.98, 61% women) and most identified as White (90%) and married (55%). Education ranged from less than a high school degree to a graduate degree, with Bachelor's degree the most common (30%). Most reported working at least part time (45% retired). Younger adult participants ranged from 18 to 36 years old (M = 19.44, SD = 2.25, 49% female, 80% White, parents' education averaged a Bachelor's degree, 38% were in a romantic relationship).

Participants completed online surveys over nine consecutive days. The Day 1 survey collected demographic information (e.g., age, gender, and education) and control beliefs. The Day 2-9 surveys contained items assessing daily subjective ages, daily affect, daily physical health symptoms, and daily stressors. Participants were asked to complete the daily surveys in the evening when they had sufficient time to devote to the survey.

For the purposes of the present study, analyses reflect data from 223 (107 younger, 116 older). Older adults completed 743 out of 1,044 possible study days (71% completion). Younger adults completed 884 out of 963 possible study days (92% completion).

Measures

Daily Subjective Age

Subjective age was assessed with two items: "How old do you feel today?" (raw felt age), and "If you could choose your age, how old would you want to be today?" (raw ideal age). Participants indicated their response by filling in the appropriate number of years.

Subjective Age Discordance (SAD). Subjective age discordance scores were created by subtracting raw ideal age from raw felt age and then dividing by chronological age (Rupprecht & Lang, 2020). The proportional score indicates the strength of the discordance as a percentage of the participant's chronological age. Positive scores indicated a discordance such that one desired to be younger than one felt, whereas negative scores indicated a discordance such that one desired to be older than one felt. Null scores indicated concordance between felt and ideal ages.

Felt Age. Raw felt age scores were converted to proportional discrepancy scores for analysis by subtracting chronological age from raw felt age then dividing by chronological age (Bellingtier et al., 2017). These scores represent what percent younger (negative scores) or older (positive scores) an individual subjectively feels compared to their chronological age. Note that both subjective aging constructs include raw felt age and chronological age in their calculations, thus they are expected to be naturally correlated constructs.

Daily Well-Being

Four common indicators of daily well-being were included: daily positive and negative affect, daily physical symptoms, and daily stressors.

Daily Positive and Negative Affect. Daily affect was assessed using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). The PANAS consists of two 10-

item mood scales. Positive affect was measured by words such as interested, alert, and inspired, whereas negative affect was measured by words such as irritable, ashamed, and nervous. Participants were asked to indicate the extent to which they felt these emotions in the past 24-hours. Responses were measured on a five-point Likert scale, such that higher scores indicated more of the affect. Scores for each item were averaged, and participants received a daily score for positive and negative affect. Within-person reliability (Scott et al., 2020) was acceptable (positive affect = .83, negative affect = .83).

Daily Physical Symptoms. Daily physical symptoms were measured based on a modified version of Larsen and Kasimatis's (1991) physical symptom checklist and consisted of 28 different symptoms (e.g., fatigue, joint pain, cough, and allergies). Participants checked a box next to all symptoms that applied to them for that day. A daily composite was created for each day based on the sum of experienced symptoms. Higher scores indicate more reported physical symptoms, or poorer physical health.

Daily Stressors. Daily stressors were measured using a written version of the Daily Inventory of Stressful Events (DISE; Almeida et al., 2002). Participants indicated whether or not they had experienced seven types of stressors within the past 24 hours, these included: disagreements, potential disagreements, stressful events in the workplace/volunteer setting, stressors at home, network stressors, (e.g., stressors occurring to one's family and friends), personal health stressors, (e.g., problems receiving treatment, medication-related issues, and illnesses) and other stressors. Individuals received a summed total stressor score for each day with higher scores indicating more stressors.

Personal Control Beliefs

We included control beliefs as a covariate in our analyses, because such beliefs were recently found to be related to subjective aging constructs and well-being (Bellingtier & Neupert, 2020; Neupert & Bellingtier, 2020). Control beliefs were assessed on Day 1 with The Sense of Control Scales from the Midlife Development Inventory (Lachman & Weaver,

1998), scores could range from 2 to 14 with higher scores indicate more control (Cronbach's Alpha = .89).

Analytic Strategy

To assess the presence, strength, and variability of subjective age discordance in daily life for younger and older adults, individual means and standard deviations were created from the daily diary data and compared between the age-groups via independent sample *t*-tests. As an additional indicator of variability we computed the intraclass correlation coefficient (ICC) for subjective age discordance separately for each age group.

To examine how subjective age discordance co-varies with day-to-day contextual variables, specifically positive affect, negative affect, stressors, and physical symptoms, bivariate correlations were examined at the between- and within-person level across all participants.

In order to assess the differential predictive ability of daily subjective age discordance versus daily felt age, a series of multilevel models were conducted with positive affect, negative affect, physical symptoms, and daily stressors as the outcome variables using this equation:

$$\text{Outcome}_{it} = \gamma_{00} + \gamma_{10}\text{DAILY\_SAD}_{it} + \gamma_{20}\text{DAILY\_FA}_{it} + \gamma_{30}\text{DAY}_{it} + \gamma_{01}\text{MEAN\_SAD}_{i} + \gamma_{02}\text{MEAN\_FA}_{i} + \gamma_{03}\text{CONTROL}_{i} + \gamma_{04}\text{AGE}_{i} + u_{0i} + r_{it} \quad (1)$$

The daily outcomes were predicted by daily subjective age discordance (γ_{10}), daily felt age proportional discrepancy(γ_{20}), and individuals' mean levels on these variables (γ_{01} and $\gamma_{02,}$ respectively). This allowed us to account for and separate variation due to daily fluctuations versus individual differences (Kreft et al., 1995). The subjective aging variables all have meaningful zeros (i.e., indicating that felt, ideal, and chronological age are all in alignment), allowing us to interpret the intercept as reflecting the level of the outcome variable when subjective age aligns with chronological age.

We controlled for grand-mean centered control beliefs (γ_{03}), days in the study (γ_{30}), and chronological age (γ_{04}). Controlling for days in the study captures any variance that is attributable to study participation and is coded such that 0 equals the first study day. Age was a dichotomous variable (0 = younger adults, 1 = older adults). Thus, the intercept can further be interpreted as the expected value of the outcome when chronological, felt, and ideal ages are all aligned for younger adults with sample-mean levels of control on the first study day. A similar estimate can be made for older adults by adding or subtracting the age estimate from the intercept. We examined more complex models including age interactions, but there were no interactions with daily subjective age discordances. Thus these models pertain to the entire sample.

Results

Strength and Variability of Subjective Age Discordance by Age-Group

The between-person analytic variables for younger and older adults are compared in Table 1. In comparison to their chronological age, older adults felt and desired to be younger. In contrast, younger adults felt and desired to be older on average. Importantly, all participants, on average, reported a positive subjective age discordance, indicating that both groups desired to be younger than they felt. The strength of the subjective age discordance was larger for older than younger adults. Regarding the variability, younger participants had more individual variability around their mean subjective age discordance than older adults as indicated by their individual standard deviations (iSD, see Table 1). This was also reflected in higher intra-class correlations for older (ICC = .81) than younger adults (ICC = .35).

Covariation of Subjective Age Discordance and Well-Being Variables

Table 2 presents the bivariate correlations for subjective age discordance and the well-being variables for all study participants. At the between-person level, desiring to be younger than one feels (i.e., higher subjective age discordance) was significantly correlated with reporting lower mean positive affect and control beliefs and higher average numbers of

physical symptoms and daily stressors (see bottom-half of Table 2). Individuals who felt older than their chronological age reported lower average positive affect, and higher average negative affect. They also reported more physical symptoms and daily stressors on average. On the daily within-person level, days when one desired to be younger than one felt were associated with less daily positive affect and more daily physical symptoms (see top-half of Table 2). Daily variations in felt age followed a similar pattern: days with less positive affect, more negative affect, and higher numbers of physical symptoms and stressors were associated with feeling older.

Comparing Subjective Age Discordance and Felt Age

The results regarding the differential predictive ability of daily subjective age discordance versus daily felt age are presented in Table 3. In the positive affect model, on days with less subjective age discordance, but not on days with older felt age, more positive affect was reported. In the negative affect model, when competing with each other, neither subjective age discordance nor felt age was significantly associated with daily negative affect at either level. In regards to the physical symptoms model, days with older felt age were associated with more physical symptoms. Although there was no daily association, on the between-person level, individuals who tended to be more discordant reported more average physical symptoms. Likewise, in the daily stressors model, individuals who reported being more discordant on average also tended to report more daily stressors on average. At the within-person level, days with older felt age, but less discordance, were associated with more daily stressors. These findings are applicable across all participants.

Additional models were also considered to address age-moderation and additional control variables. Models that included age interactions found no significant interactions in the physical symptoms, negative affect, and daily stressor models. In the positive affect model, higher daily felt age was associated with less positive affect in older adults, higher mean felt age was associated with less positive affect in younger adults, and higher mean

subjective age discordance was associated with less positive affect in older adults. These interactions added < 1% to the explained variance. There were no age interactions with daily subjective age discordance in any model. The pattern of findings remained unchanged when gender and education were added as control variables, and when age was modeled as a continuous (instead of a dichotomous) variable.

Discussion

Our primary goal was to investigate the presence and strength of subjective age discordance (SAD) in daily life, as well as its variation and covariation with day-to-day contextual variables of positive affect, negative affect, stressors, and physical symptoms. Our results suggest that there are meaningful differences and variability in daily subjective age discordance, with older adults reporting larger SAD on average than younger adults, but younger adults reporting more within-person variability in SAD than older adults. In addition, we show that on days when younger ideal ages are further away from felt age (i.e., on days with larger SAD) individuals are more likely to experience lower positive affect. At the between-person level, those with larger SAD report more physical symptoms and stressors than those with smaller SAD. Importantly, these effects were over and above the contribution of daily and person-level felt age as well as chronological age, further demonstrating the unique contribution of daily subjective age discordances.

Presence and Variability of Daily Subjective Age Discordance

Our results showed that on average, both younger and older participants reported an older perceived age than ideal age, consistent with Rupprecht and Lang (2020). We build on previous results that focused on mean-level differences between people and now document day-to-day fluctuations in SAD, suggesting that the discordance between felt and ideal age changes within a person on a daily basis. Whereas Rupprecht and Lang (2020) showed that SAD emerges in early adulthood as a result of increasingly lower proportional ideal ages and then increases again in later life, their results highlight important mean-level differences

without considering daily experiences. Age differences in the individual standard deviation of SAD, and the higher intraclass correlation coefficients for older adults, showed that younger adults had more day-to-day variability than older adults. Perhaps aging experiences and ideals are more salient and manifest for older adults, suggesting a heightened relevance of negative age stereotypes, which stabilizes SAD (Kotter-Grühn & Hess, 2012). For younger adults, in contrast, subjective aging might depend more strongly on varying context and situations (Bellingtier & Neupert, 2019). Furthermore, younger adults are also more likely to face competing aging ideals. On the one hand, they are aware of the negative aging stereotypes that older adults face, but they may also be confronting negative stereotypes about young adults or younger generations (Weiss & Zhang, 2020). These competing ideals could result in greater variability in their subjective age discordance in comparison to older adults.

Daily Well-Being and Subjective Age Discordance Across Ages

We examined the associations between subjective age discordance and well-being at the bivariate level and, more rigorously, by modeling the unique contribution of daily SAD over and above felt age and chronological age on daily positive affect, negative affect, physical symptoms, and stressors. Self-discrepancy theory suggests that the presence of discordances between perceived and ideal self-states is associated with lower psychological well-being rather immediately (e.g., Barnett et al., 2018; Higgins, 1987), and our results support this conclusion within a person on a daily basis with respect to increases in SAD being associated with decreases in positive affect. Positive affect is higher when ideal and felt age are more alike and converging on the within-person level.

The patterns for stressors and physical symptoms at the between-person level are also consistent with self-discrepancy theory, where people with larger SAD reported more stressors and more physical symptoms compared to those with smaller SAD. Considering the cross-sectional nature of the between-person level in this study, this finding may also suggest that people, who are less healthy and who experience more stressors, are more likely to wish

that they were younger than they feel (cf. Westerhof et al., 2014). The larger SAD may thus also reflect a desire to be healthier, on average.

Other associations with SAD were less consistent across approaches. Although there was a bivariate within-person association between higher daily SAD and more physical symptoms, when competing with felt age, the association was no longer present. Discrepancies between felt age and chronological age thus seem more closely associated with physical health than discrepancies between felt and ideal ages (Bellingtier et al., 2017; Westerhof et al., 2014). A daily association between subjective age discordance and stressors was absent at the bivariate level, but present when modeled together with felt age. This association was unexpected as it indicates that on days in which people wish to be younger than they feel, there are fewer stressors as compared to days in which there is a small discordance of felt and ideal age. What is consistent across both approaches is that the experience of a greater subjective age discrepancy is associated with more between-person stressors and health symptoms whereas days with a smaller subjective age discrepancy are associated with more positive affect than days with a greater subjective age discrepancy.

Additionally, it should be noted that SAD and felt age (when calculated as a proportional discrepancy) are related constructs, with both including raw felt age and chronological age in their calculations. Thus they are naturally highly correlated constructs. We have examined them simultaneously in order to demonstrate the unique utility of SAD, above and beyond felt age. Our results suggest that daily SAD would be especially beneficial for researchers interested in understanding the relationship between daily subjective aging and positive affect. We recommend future researchers select the subjective aging construct that best matches their research questions.

Limitations and Future Directions

These results should be considered alongside some limitations. Specifically, our extreme age groups design prevents us from examining these patterns at midlife and limits are

conclusions to early young adulthood (the majority of participants were 18-22) and primarily young-old adults (the majority of participants were in their 60s). This could be an important future direction given the nonlinear trend of SAD across the adult lifespan (Rupprecht & Lang, 2020). In addition, the younger and older adults were recruited in different methods (MTurk vs. university) and in different seasons (spring vs. fall), and neither group is a representative, nor a particularly large, sample. Older adults on MTurk and younger adults in university are both more likely to be socially advantaged compared to the general population. Additional research is needed to improve the generalizability of the findings. For example, the Covid-19 pandemic has altered both aging perceptions and daily life experiences, and it is unknown if the associations we have observed would hold under these conditions. Furthermore, asking individuals to report their felt age may prime their response to the ideal age question. Greater separation of these measures in the questionnaire to could help ameliorate this concern in future research.

As Rupprecht and Lang (2020) suggested, one potential avenue for future research entails the role of coping with SAD against the backdrop of aging stereotypes and views on aging (Kotter-Grühn & Hess, 2012; Miche, Wahl, et al, 2014). Based on our current results, individual differences in SAD may be related to coping with age-associated differences in physical symptoms and daily stressor exposure across adulthood. Further investigation in this realm will require longitudinal data over more extended time intervals and including the entire adult life span from early to middle and late adulthood. The results of our research suggest that within-person fluctuations in coping with SAD could play a role with regard to daily positive affect. Efforts to cope with an increase in SAD may have an emotional cost, as positive affect decreases when SAD increases, but these possibilities will need to be examined in future work.

Furthermore, future work should consider the contextual variables that contribute to variability in SAD. We have looked at associations with daily well-being variables, but were

limited to participants' self-reports. Future work could consider incorporating details about the presence of others in the environment. For example, self-perceptions of aging can be influenced by partner's aging perceptions (Cohn-Schwartz et al., 2021) and the social support they provide (Zhou et al., 2021). The absence of others, especially if accompanied by feelings of loneliness (Santini et al., 2019), could also contribute to changes in daily SAD. Daily fluctuations could also be related to the saliency of various life-domains at a moment in time (Kornadt et al., 2016). For example, individuals may experience a greater subjective aging discrepancy in the work environment than with their family.

Conclusions

In sum, our findings point to the malleability and flexibility of subjective aging experiences associated with the discordance of felt age with ideal age on a day-to-day basis. This discrepancy was larger in older adults, but more variable in younger adults. Building on past research, our findings suggest that between-person effects of SAD on psychological and physical well-being are also reflected in the effects of within-person SAD regarding daily well-being. On a daily level, a greater alignment of ideal and felt ages predicts increases in positive affect. This finding suggests that efforts to improve well-being through interventions targeting subjective age do not need to focus exclusively on lowering felt age, which has been criticized as an ageist approach to subjective aging (Gendron et al., 2018). Instead, efforts to raise perceptions of ideal age could also be effective in improving daily well-being, and provide a counter-narrative to negative stereotypes of aging. Future research that combines the strengths of daily diary and longitudinal designs, such as measurement burst approaches, could help to understand the long-term implication of daily variations and covariations in subjective age discrepancies.

References

Almeida, D. M., Wethington, E., & Kessler, R. C. (2002). The Daily Inventory of Stressful Events: An interview-based approach for measuring daily stressors. *Assessment*, *9*(1), 41-55. https://doi.org/10.1177/1073191102091006

Armenta, B. M., Scheibe, S., Strobe, 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. http://dx.doi.org/10.1037/pag0000263

Barker, E. T., & Galambos, N. L. (2005). Adolescents' implicit theories of maturity: Ages of adulthood, freedom, and fun. *Journal of Adolescent Research, 20*(5), 557–576. https://doi.org/10.1177/0743558405274872

Barnett, M. D., Moore, J. M., & Harp, A. R. (2018). Who we are and how we feel: Self-discrepancy theory and specific affective states. *Personality and Individual Differences, 111,* 232-237. http://dx.doi.org/10.1016/j.paid.2017.02.024

Barrett, A. E., & Montepare, J. M. (2015). "It's about time." Applying life span and life course perspectives to the study of subjective age. In M. Diehl & H.-W. Wahl (Eds.), *Annual review of gerontology and geriatrics: Vol. 35. Research on subjective aging: New developments and future directions* (pp. 55-77). Springer.

Bellingtier, J. A., & Neupert, S. D. (2019). Daily subjective age in emerging adults: "Now we're stressed out". *Emerging Adulthood, 7*(6), 468-477. https://doi.org/10.1177/2167696818785081

Bellingtier, J. A. & Neupert, S. D. (2020). Feeling young and in control: Daily control beliefs predict younger subjective ages. *Journal of Gerontology: Psychological Sciences, 75*(5), e13-e17. https://doi.org/10.1093/geronb/gbz015

Bellingtier, J. A., Neupert, S. D., & Kotter-Grühn, D. (2017). 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, 72*(4), 613-621. http://dx.doi.org/10.1093/geronb/gbv10

Bodner, E., Shrira, A., Hoffman, Y., & Bergman, Y. S. (2021). Day-to-day variability in subjective age and ageist attitudes and their association with depressive symptoms. *The Journals of Gerontology: Series B, 76*(5), 836-844. https://doi.org/10.1093/geronb/gbaa125

Brandtstädter, J., & Renner, G. (1990). Tenacious goal pursuit and flexible goal adjustment: explication and age-related analysis of assimilative and accommodative strategies of coping. *Psychology and Aging, 5*(1), 58–67. https://doi.org/10.1037//0882-7974.5.1.58

Brothers, A., Miche, M., Wahl, H-W., &Diehl, M. (2017). Examination of associations among three distinct subjective aging constructs and their relevance for predicting developmental correlates, *The Journals of Gerontology: Series B*, 72(4), 547-560. https://doi.org/10.1093/geronb/gbv085

Chopik, W. J., Bermner, R. H., Johnson, D. H., & Giasson, H. L. (2018). Age differences in age perceptions and developmental transitions. *Frontiers in Psychology, 9,* Article 67. http://dx.doi.org/10.3389/fpsyg.2018.00067

Cohn-Schwartz, E., Segel-Karpas, D., & Ayalon, L. (2021). Longitudinal dyadic effects of aging self-perceptions on health. *The Journals of Gerontology: Series B, 76(5), 900-909*. https://doi.org/10.1093/geronb/gbaa082

Galambos, N. L., Turner, P. K., & Tilton-Weaver, L. C. (2005). Chronological and subjective age in emerging adulthood: The crossover effect. *Journal of Adolescent Research, 20*(5), 538-556. http://dx.doi.org/10.1177/0743558405274876

Galambos, N. L., Barker, E. T., & Tilton-Weaver, L. C. (2003). Who gets caught at the

maturity gap? A study of pseudomature, immature, and mature adolescents. *International Journal of Behavioral Development, 27*(3), 253-263. http://dx.doi.org/0.1080/101650250244000326

Gendron, T. L., Inker, J., & Welleford, A. (2018). "How old do you feel?" The difficulties and ethics of operationalizing subjective age. *The Gerontologist*, *58*(4), 618–624, https://doi.org/10.1093/geront/gnx098

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*(3), 319–340. http://dx.doi.org/10.1037/0033-295X.94.3.319

Hubley, A. M., & Russell, L. B. (2009). Prediction of subjective age, desired age, and age satisfaction in older adults: Do some health dimensions contribute more than others? *International Journal of Behavioral Development, 33*(1), 12–21. http://dx.doi.org/10.1177/0165025408099486

Kastenbaum, R., Derbin, V., Sabatini, P., & Artt, S. (1972). "The ages of me": Toward personal and interpersonal definitions of functional aging. *The International Journal of Aging and Human Development, 3*(2), 197-211. http://dx.doi.org/10.2190/TUJR-WTXK-866Q-8QU7

Kaufman, G., & Elder, G. H., Jr. (2002). Revisiting age identity: A research note. *Journal of Aging Studies, 16*(2), 169–176. https://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. http://dx.doi.org/10.1080/13607863.2011.596811

Kornadt, A. E., Meissner, F., & Rothermund, K. (2016). Implicit and explicit age stereotypes for specific life-domains across the life span: Distinct patterns and age group differences. *Experimental Aging Research, 52,* 195-211. http://dx.doi.org/10.1080/0361073X.2016.1132899

Kotter-Grühn, D., & Hess, T. M. (2012). The impact of age stereotypes on self-perceptions of

aging across the adult lifespan. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 67*(5), 563-571. http://dx.doi.org/10.1093/geronb/gbr153

Kotter-Grühn, D., Kornadt, A. E., & Stephan, Y. (2016). Looking beyond chronological age: Current knowledge and future directions in the study of subjective age. *Gerontology, 62*(1), 86–93. http://dx.doi.org/10.1159/000438671

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. http://dx.doi.org/10.1080/08870446.2015.1061130

Kreft, I. G. G., de Leeuw, J., & Aiken, L. S. (1995). The effect of different forms of centering in hierarchical linear models. *Multivariate Behavioral Research* 30(1). 1-21. http://dx.doi.org/10.1207/s15327906mbr3001_1

Lachman, M. E., & Weaver, S. L. (1998). Sociodemographic variations in the sense of control by domain: Findings from the MacArthur studies of midlife. *Psychology and Aging, 13*(4), 553–562. https://doi.org/10.1037/0882-7974.13.4.553

Larsen, R. J., & Kasimatis, M. (1991). Day-to-day physical symptoms: Individual differences in the occurrence, duration, and emotional concomitants of minor daily illnesses. *Journal of Personality, 59*(3), 387–423. https://doi.org/10.1111/j.1467-6494.1991.tb00254.x

Luhmann, M., & Hennecke, M. (2017). The motivational consequences of life satisfaction. *Motivation Science, 3*(1), 51–75. http://dx.doi.org/10.1037/mot0000048

Mason, T. B., Smith, K. E., Engwall, A., Lass, A., Mead, M., Sorby, M., Bjorlie, K., Strauman, T. J., & Wonderlich, S. (2019). Self-discrepancy theory as a transdiagnostic framework: A meta-analysis of self-discrepancy and psychopathology. *Psychological Bulletin, 145*(4), 372-389. http://dx.doi.org/10.1037/bul0000186

Miche, M., Elsässer, V. C., Schilling, O. K., & Wahl, H.-W. (2014). Attitude toward own

aging in midlife and early old age over a 12-year period: Examination of measurement equivalence and developmental trajectories. *Psychology and Aging, 29*(3), 588-600. http://dx.doi.org/10.1037/a0037259

Miche, M., Wahl, H.-W., Diehl, M., Oswald, F., Kaspar, R., & Kolb, M. (2014). Natural occurence of subjective aging experiences in community-dwelling older adults. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 69*(2), 174-187. http://dx.doi.org/10.1093/geronb/gbs164

Neupert, S. D., & Bellingtier, J. D. (2017). Aging attitudes and daily awareness of age-related change interact to predict negative affect. *The Gerontologist, 57*(S2), 187-192. http://dx.doi.org/10.1093/geront/gnx05

Neupert, S.D., & Bellingtier, J.A. (2019). Daily stressor forecasts and anticipatory coping: Age differences in dynamic, domain-specific processes. *Journal of Gerontology: Psychological Sciences*, *74*(1), 17-28. http://dx.doi.org/10.1093/geronb/gby043

Neupert, S. D. & Bellingtier, J. A. (2020). Control and cognition: Contextual and individual differences in cognitive aging. In A. Gutchess & A. Thomas (Eds.), *The Cambridge handbook of cognitive aging: A life course perspective* (pp. 514-531). Cambridge University Press. https://doi.org/10.1017/9781108552684

Neupert, S. D., Bellingtier, J. A., & Smith, E. J. (2019). Anticipated and actual emotional reactivity changes surrounding the 2016 U.S. presidential election. *Current Psychology*. Advance online publication. https://doi.org/10.1007/s12144-019-00215-y

Pinquart, M., & Wahl, H.-W. (2021). Subjective Age from Childhood to Advanced Old Age: A Meta-Analysis. *Psychology and Aging*. Advance online publication. http://dx.doi.org/10.1037/pag0000600

Rubin, D. C., & Berntsen, D. (2006). People over forty feel 20% younger than their age: Subjective age across the lifespan. *Psychonomic Bulletin & Review, 13*(5), 776-780. http://dx.doi.org/10.3758/bf03193996

Rupprecht, F. S., & Lang, F. R. (2020). Personal ideals of aging and longevity: The role of subjective discordances. *Psychology and Aging, 35*(3), 385-396. http://dx.doi.org/10.1037/pag0000455

Ryff, C. D. (1991). Possible selves in adulthood and old age: A tale of shifting horizons. *Psychology and Aging, 6*(2), 286-295. http://dx.doi.org/10.1037/0882-7974.6.2.286

Santini, Z. V., Koyanagi, A., Tyrovolas, S., Harp, J. M., & Koushede, V. (2019). The association of social support networks and loneliness with negative perceptions of ageing: evidence from the Irish Longitudinal Study on Ageing (TILDA). *Ageing and Society, 39*(5), 1070–1090. https://doi.org/10.1017/S0144686X17001465

Scott, S.B., Sliwinski, M.J., Zawadzki, M., Stawski, R.S., Kim, J., Marcusson-Clavertz, D., Lanza, S.T., Conroy, D.E., Buxton, O., Almeida, D.M., & Smyth, J.M. (2020). A coordinated analysis of variance in affect in daily life. *Assessment, 27*(8) 1683-1698. https://doi.org/10.1177/1073191118799460

Shrira, A., Segel-Karpas, D., Bodner, E., & Palgi, Y. (2020). Subjective age and emotion covariation: Findings from two daily experience studies. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 75*(5), 991-1000. http://dx.doi.org/10.1093/geronb/gby125

Stephan, Y., Caudroit, J., Jaconelli, A., & Terracciano, A. (2014). Subjective age and cognitive functioning: A 10-year prospective study. *American Journal of Geriatric Psychiatry, 22*(11), 1180-1187. http://dx.doi.org/10.1016/j.jagp.2013.03.007

Stephan, Y., Sutin, A. R., & Terracciano, A. (2015). How old do you feel? The role of age discrimination and biological aging in subjective age. *PloS ONE 10*(3): e0119293. http://dx.doi.org/10.1371/journal.pone.0119293

Uotinen, V., Rantanen, T., Suutama, T., & Ruoppila, I. (2006). Change in subjective age

among older people over an eight-year follow-up: “Getting older and feeling younger?” *Experimental Aging Research, 32*(4), 381–393. http://dx.doi.org/10.1080/03610730600875759

Ward, R. A. (2010). How old am I? Perceived age in middle and later life. *The International Journal of Aging & Human Development, 71*(3), 167–184. http://dx.doi.org/10.2190/AG.71.3.a

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063

Weiss, D., & Lang, F. R. (2009). Thinking about my generation: Adaptive effects of a dual age identity in later adulthood. *Psychology and Aging, 24*(3), 729-734. http://dx.doi.org/10.1037/a0016339

Weiss, D. & Zhang, X. (2020). Multiple sources of aging attitudes: Perceptions of age groups and generations from adolescence to old age across China, Germany, and the US. *Journal of Cross-Cultural Psychology (5)*6, 407-423. http://dx.doi.org/ 10.1177/0022022120925904

Westerhof, G. J., Miche, M., Brothers, A. F., Barrett, A. E., Diehl, M., Montepare, J. M., Wahl, H.-W., & 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. http://dx.doi.org/10.1037/a0038016

Zhou, W., Chen, D., Hong, Z., Fan, H., Liu, S., & Zhang, L. (2021). The relationship between health-promoting lifestyles and depression in the elderly: roles of aging perceptions and social support. *Quality of Life Research, 30*, 721-728. https://doi.org/10.1007/s11136-020-02674-4

Table 1

Comparison of Younger and Older Adults

	Younger		Older				
	Mean	*SD*	Mean	*SD*	*t*	*p*	95% *CI* Diff
SA Discordance	0.14	0.53	**0.26**	0.21	-2.16	.033	-0.23, -0.01
Raw Felt Age [a]	23.61	8.24	**56.47**	9.74	-26.78	<.001	-35.27, -30.44
Raw Ideal Age [a]	21.04	5.35	**39.54**	12.21	-14.52	<.001	-21.02, -15.98
SAD iSD [b]	**0.36**	0.52	0.07	0.06	5.56	<.001	0.18, 0.39
Felt Age [c]	**0.22**	0.45	-0.09	0.28	6.22	<.001	0.22, 0.42
Positive Affect	2.64	0.71	**3.23**	0.81	-5.72	<.001	-0.79, -0.39
Negative Affect	**1.83**	0.58	1.38	0.56	5.85	<.001	0.30, 0.61
Physical Symptoms	1.62	1.79	1.97	1.92	-1.44	.151	-0.85, 0.13
Daily Stressors	0.52	0.57	0.42	0.59	1.19	.237	-0.06, 0.24
Control Beliefs	10.42	1.44	10.04	2.13	1.63	.105	-0.12, 0.84
Chronological Age	19.44	2.25	**64.71**	4.98	-67.52	<.001	-43.64, -41.17

Note. SA = Subjective Age; *CI* Diff = confidence interval for the difference between means. Bolded numbers are significantly higher than the corresponding number for the other age group at $p < .05$.

[a] Raw scores used to compute SA Discordance. [b] Individual standard deviations for subjective age discrepancy scores. [c] Proportional discrepancy score.

Table 2

Between-Person and Within-Person Correlations for Study Variables

	1	2	3	4	5	6
1. SA Discordance		**.77**	**-.12**	.03	**.29**	.11
2. Felt Age [a]	**.60**		**-.25**	**.15**	**.21**	**.14**
3. Positive Affect	**-.17**	**-30**		-.12	-.09	.02
4. Negative Affect	.06	**.22**	**-.18**		.09	**.19**
5. Physical Symptoms	**.38**	**.24**	-.11	.08		**.29**
6. Daily Stressors	**.16**	**.24**	.02	**.20**	**.26**	
7. Control Beliefs	**-.17**	-.12	**.32**	**-.27**	**-.20**	-.02

Note. Correlations above the diagonal are within-person correlations and correlations below the diagonal are between-person correlations based on individual means for the daily variables. Correlations significant at $p < .05$ are in bold.

[a] Proportional discrepancy score.

Table 3

Four Multilevel Models Comparing Effects of Daily Subjective Age Discordance and Felt Age

	Positive Affect		Negative Affect		Physical Symptoms		Daily Stressors	
	Estimate	*CI*	Estimate	*CI*	Estimate	*CI*	Estimate	*CI*
Intercept	**2.74**	2.58, 2.89	**1.85**	1.74, 1.97	**1.94**	1.57, 2.32	**0.73**	0.60, 0.85
Daily SAD	**-0.17**	-0.29, -0.05	-0.02	-0.13, 0.08	0.01	-0.30, 0.31	**-0.26**	-0.41, -0.11
Daily FA	0.10	-0.04, 0.24	0.06	-0.07, 0.19	**0.42**	0.05, 0.79	**0.39**	0.21, 0.57
Day [a]	**-0.02**	-0.03, -0.01	-0.01	-0.02, 0.003	**-0.14**	-0.17, -0.11	**-0.08**	-0.09, -0.06
Age [b]	**0.72**	0.47, 0.96	**-0.52**	-0.71, -0.33	0.30	-0.30, 0.89	0.07	-0.19, 0.26
Mean SAD	-0.19	-0.55, 0.16	0.14	-0.13, 0.41	**1.31**	0.45, 2.17	**0.29**	0.003, 0.58
Mean FA	-0.05	-0.44, 0.33	-0.09	-0.39, 0.21	0.08	-0.85, 1.02	-0.01	-0.33, 0.30
Control	**0.14**	0.09, 0.20	**-0.10**	-0.13, -0.06	**-0.14**	-0.27, -0.02	-0.01	-0.05, 0.03
Random Intercept	**0.44**	0.36, 0.55	**0.24**	0.20, 0.31	**2.52**	2.05, 3.17	**0.20**	0.16, 0.26
Residual	**0.23**	0.21, 0.25	**0.18**	0.17, 0.20	**1.53**	1.41, 1.66	**0.39**	0.36, 0.43
ICC	.73		.64		.65		.67	
R^2 [c]	21%		16%		15%		8%	

Note. SAD = Subjective Age Discordance; FA = Felt Age proportional discrepancy score; CI = 95% Confidence Interval. Estimates significant at $p < .05$ are in bold.

[a] Day is a continuous variable indicating how many days the participant had been in the study. [b] 0 = young adults, 1 = older adults. [c] R^2 within-person calculated as recommended by Snjiders & Bosker (2012).