## Age Patterns in Dual-Cycle Identity Processes and their Associations with Life

Satisfaction

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# Abstract

**Objective:** Identity development research often applies the identity status approach, which distinguishes different dimensions of identity-relevant commitment levels and exploration behavior. However, age differences in these dimensions have mostly been examined in adolescence and young adulthood, leaving questions about their variation across the adult lifespan. Additionally, associations between identity and life satisfaction have been equally understudied in adult populations. **Method:** We examined these questions in a large, nationally representative U.K sample (*N*= 3,869; age range 18-97). Identity processes were measured using an abbreviated Dimensions of Identity Development Scale (Johnson et al., 2022). After invariance testing by age groups, we examined age differences across identity dimensions: *Commitment and Exploration (depth, breadth, ruminative)*. **Results:** Older individuals reported lower

scores on all exploration dimensions, until late adulthood. However, though no age differences in commitment were observed between early and middle adulthood, less commitment was reported from middle to late adulthood. Additionally, commitment and exploration in depth were consistently positively associated with life satisfaction, whereas ruminative exploration negatively predicted life satisfaction, with stronger associations appearing in later adulthood. **Conclusions:** These findings demonstrate the feasibility of studying identity across adulthood from a measurement perspective and highlight how identity dimensions relate to well-being at different ages. KEYWORDS: Identity Processes , Age Differences, Gender Differences, Life Satisfaction, Lifespan Psychology

#### Age Patterns in Dual-Cycle Identity Processes and their Associations with Life

#### Satisfaction

Identity development primarily starts in adolescence and continues across the entire lifespan. Yet, most research has focused on adolescents and young adults and much less attention has been devoted to the years beyond young adulthood (Fadjukoff&Kroger, 2016). Even so, the life phases after young adulthood each pose their own unique challenges to identity, such as the transition to parenthood (Höfner et al., 2011; Laney et al., 2015) and to retirement (Osborne, 2009). In addition, different life phases may put different demands on individuals' identity, which may cause age-related variation in the adaptiveness of identity processes. To address these issues, the present study focuses on age patterns in identity process and their links

with satisfaction across the adult lifespan (i.e., age 18 to 97) in the United Kingdom

(U.K.).

#### **Identity Across the Lifespan**

Following Erikson's (1963) lifespan model of development, gaining a sense of identity (versus role confusion) is the central developmental task during adolescence. How individuals manage this task is thought to be associated with how they navigate developmental tasks that are more central to adulthood, such as gaining intimacy versus isolation, developing generativity versus stagnation, and attaining ego-integrity versus despair. Erikson (1950/1993; p. 261-262) defined identity as "...the accrued confidence that the inner sameness and continuity prepared in the past are matched by the sameness and continuity of one's meaning for others...". Later work (Marcia, 1966) boiled this rather broad definition down to the more specific concept of commitments to important choices in life, such as the choice for a particular romantic partner or career.

However, identity development does not end after having made commitments. Also, the commonly held belief that identity formation stops by the end of adolescence, or "emerging adulthood", misrepresents Erikson's (1963) work and subsequent research. Instead, identity formation consists of a dynamic process that allows individuals to continuously evaluate and update their commitments across the adult lifespan. Although already emphasized by Erikson (1963), this dynamic nature was further articulated in later works on models of identity.

Besides emphasizing the importance of commitment, Marcia (1966) attempted to

capture the dynamic process of identity development by also focusing on exploration processes. Exploration captures the process of taking stock of, and learning more about what identity options are available, for instance in choosing one's romantic partner or career. Depending on their combination of the level as well as the timing of commitment formation and exploration, four identity statuses emerge. Despite Marcia' s (1966) emphasis on exploration alongside commitment, this model has been critiqued for inadequately explaining identity development. Specifically, the model was thought to be too "static" because even when it would be applied longitudinally, it only provided snapshots of one's current state of identity formation with there being little

information on the developmental process (e.g., Bosma, 1985; Grotevant, 1987).

Stephen and colleagues (1993) attempted to address these critiques by emphasizing that there is not an "end point" in identity development, but did not change Marcia's (1966) conceptualization otherwise. More recent "dual-cycle" models of identity (Crocetti et al., 2008; Luyckx et al., 2008) took a different approach by capturing how individuals may go through more formative and more evaluative phases in their identity development. The periods that are described as "formation" are characterized by broadly exploring one's options and eventually making a commitment to an option. More evaluative periods are characterized by exploring the fit of commitments to one's sense of self more deeply and increasing (or decreasing) one's identification with the commitments accordingly (Luyckx et al., 2008).

Furthermore, such dynamic models also explain that individuals may move between

such cycles at any point during the lifespan. For example, they may negatively

evaluate a previously made commitment, consider discarding it, and therefore return to the formation cycle.

Despite the fact that dual-cycle models are well-equipped to assess identity formation across the lifespan, research using these models has been mostly amassed in the second and third decade of life. In adolescence and young adulthood, there is some evidence that on average youth tend to follow the theoretical predictions by gaining stronger commitments over time (Branje et al., 2021; Meeus, 2011). In addition to these trends being observed in longitudinal work, they are also reflected in cross-sectional age-group comparisons with younger adolescents being more likely to have weak commitments and older adolescents and young adults being more likely to have strong commitments (e.g., Kroger et al., 2010; Meeus, 1996; Verschueren et al., 2017). It is important to note that despite these general trends, there is considerable inter-individual variation as many youths do not change at all over periods of several years. Also, there still is a considerable number of identity-diffused (weakly committed, weakly exploring) individuals among college students (Verschueren et al., 2017) and among individuals in their late twenties (Carlsson et al., 2016).

This past work has also emphasized the existence of potential gender differences in the extent to which individuals engage in identity processes. Particularly, although evidence regarding gender differences in identity is inconclusive, there is some work that suggests girls and young women may be more likely to

engage in exploration in breadth and depth (Meeus et al., 2010; Verschueren et al.,

2017) as well as ruminative exploration (e.g., Crocetti et al., 2011; Luyckx et al., 2008; Luyckx et al., 2015), than boys and young men. Regarding commitment, there is no consistent evidence on gender differences in either direction.

Although the bulk of research on identity processes related to exploration and commitment focuses on these early life phases, there is a growing literature base examining identity beyond adolescence and young adulthood. This work suggests that considerable identity development occurs after the early formation periods, triggered by a combination of changing external circumstances and internal needs (Kroger, 2015). This work has shown that adults in mid-adulthood were more often in identity statuses characterized by stronger commitments compared to individuals in young adulthood (Whitbourne & VanManen, 1996), and that these differences could in part be explained by situational changes during these life phases (e.g., to marriage and parenthood in midlife; Arneaud et al., 2016). Following the importance of these situational changes, Mehta et al. (2020) suggest that the period of 30-45 years (which they refer to as "established adulthood") may present unique challenges to women, as they potentially navigate conflict between decisions related to work and childbearing, during a period when commitments to careers may be strongest and exploration may be lower. Moreover, across time adult men and women both have been found to predominantly change towards identity statuses characterized by stronger commitments, and this was true regardless of whether the upper age limit was at 30

(Kroger et al., 2010), 50 (Fadjukoff et al., 2016), or 60 years-old (Cramer, 2004).

However, like in earlier life periods there is also much evidence for stability later in

adulthood. Furthermore, these transitions in identity status have been suggested to

mostly be driven by an increase in the strength of identity commitments

(Pulkkinen&Kokko, 2000).

Measurement Invariance of Identity Dimensions across the Adult Lifespan

Importantly, some of this literature has made use of identity measures that were originally created with an adolescent and young adult population in mind (e.g.,

Utrecht-Management of Commitments Scale; Crocetti et al., 2008). However,

psychometric evaluations in older populations are lacking and it is possible that these instruments do not always capture identity processes in older populations in the same way as in younger populations (c.f., Fadjukoff & Kroger, 2016). In fact, it has even been suggested that different identity processes may be at work during the very last stages of life (e.g., readjustment and maintenance of commitments; Kroger, 2002). Similarly, psychometric evaluations across the adult lifespan are also lacking for the Dimensions of Identity Development Scale (DIDS; Luyckx et al., 2008), which was used in the present study. The DIDS captures identity commitment and exploration processes in the formation cycle, in which commitment making captures the degree to which commitments to possible life paths are made and exploration in breadth the extent to which individuals compare alternative commitment options

before selecting one. In the evaluation cycle, it captures identification with

commitment which represents the degree to which commitments are perceived as fitting with one's values and as providing certainty and exploration in depth, or the degree to which existing commitments are evaluated on their fit with oneself. In addition, a fifth process captures the ruminative side of exploration, defined as continuous worry and the inability to settle on satisfying identity choices. The DIDS has been mostly used in adolescent and young adult populations and, in line with this, work on its psychometric properties has also been centered in these age groups (e.g., Johnson et al., 2021). This measure also has been applied to a variety of age groups by now including individuals well beyond the age of 30. However, such studies (e.g., Claes et al., 2018, 2019) tend to not focus on age comparisons and hence did not compare the psychometric properties of the instrument across age groups.

When examining age trends across the lifespan, it is essential to also assess measurement invariance across age groups (e.g., van de Schoot et al., 2012). Currently, there is a lack of literature describing such tests for identity measures beyond adolescence and young adulthood, which leaves it unclear how appropriate it is to compare means on identity dimensions across different age groups. Briefly, establishing measurement invariance of a construct across some variable (e.g., age, gender, etc.) is a vital step to ensure that any comparisons made are not biased by differences in how the groups, or different individuals, understand or respond to the items (see Vandenberg & Lance, 2000 for a more detailed review). Invariance testing

typically involves multiple steps. How many steps are necessary depends on the goal

of the study (Steenkamp & Baumgartner, 1998). First, *configural invariance* (i.e., "Is the basic factor structure similar across groups?") needs to be assessed to examine whether the same broader construct (i.e., identity formation) is described by the same number of dimensions in different groups. For example, hypothetically identity formation could be best described by two broad dimensions (e.g., commitment and exploration) in young adolescents, but with more dimensions (e.g., subtypes of exploration) in older age groups. Second, *metric invariance* (i.e., "Are the factor loadings similar across groups?) is necessary for making sure that correlations of variables of interest (i.e., identity dimensions) with external variables (e.g.,

psychological well-being) can be compared across groups. Third, *scalar invariance* (i.e., "Are the item intercepts equivalent?) is necessary to ensure that mean scores on a variable of interest (e.g., exploration in breadth) can be compared across different groups. Best practices suggest that a latent construct should achieve at least partial scalar invariance (i.e., one intercept of an indicator may be allowed to be freely estimated for each group, provided that a substantial drop in model fit is not observed; Byrne et al., 1989).

Previous research using a rather different, but still somewhat related instrument for the assessment of identity formation (Topolewska-Siedzik,&Cieciuch, 2019) did find age-related measurement invariance<sup>1</sup>. That suggests some evidence for age invariance in the assessment of identity formation and our (weak) hypothesis is that

this would generalize to the instrument we use: the DIDS.

## Identity and Satisfaction with Life

In line with its central developmental role, empirical evidence supports

associations between identity processes and well-being during adolescence. In

general, stronger commitments marked by higher scores on dimensional identity

measures or identity statuses characterized by high commitment tend to be

<sup>&</sup>lt;sup>1</sup> The instrument used in the Topolewska-Siedzik & Cieciuch (2019) study focuses on "modes" which are only somewhat associated with the dimensions that we focus on, as they represent a blend of work focused on identity styles (Berzonsky et al., 2013), identity formation based on the Utrecht-Management of Identity Commitments Scale (U-MICS; Crocetti et al., 2008) and the instrument we will use: the DIDS (Luyckx et al., 2008; see Topolewska & Cieciuch, 2017).

associated with higher satisfaction with life (e.g., Branje et al., 2021). Associations between exploration and well-being have been more mixed, reflecting its dual nature. That is, exploration can be stressful in the moment but potentially leads to more satisfying identity choices over time. For example, adolescents who engaged in more exploration before the transition to secondary school, reported higher school adjustment in their new school than those who explored less (De Moor et al., 2023). Despite their associations with satisfaction with life, commitment and exploration processes are not inherently positive or negative, but their functionality may rather depend on the context in which they are expressed. For instance, one study suggested that a cognitive style of approaching identity issues that tends be associated with low engagement in commitment and exploration, may be adaptive for adolescents facing economic pressures and poor material conditions (Vosylis et al.,

2021). Similarly, it is possible that commitment and exploration may have differential associations with satisfaction with life depending on the life phase that individuals are in. In fact, one study suggested that exploration in breadth (the consideration of different identity options) is positively associated with depressive symptoms among youth in their late twenties, but not in younger age groups (Luyckx et al., 2013). In addition, the negative association of depressive symptoms with commitment making and its positive association with ruminative exploration was somewhat stronger among individuals in their late twenties. The differences reported by Luyckx et al. (2013) were rather small and their study focused on a set of merged samples from

Belgium. Moreover, they only focused on the period from adolescence up to late twenties, leaving it unclear what these associations would look like later in life when social norms around specific identity profiles (e.g., stronger expectations of being committed and not exploring too much) may be stronger. That is, age-related differences may partly stem from age-related norms (i.e., how "normal" it would feel to explore). For example, Carstensen (1993, 2021) suggested that older adults experience more positive well-being relative to middle-aged adults (e.g., Blanchflower & Oswald, 2008, Brim et al., 2019), in part related to de-prioritizing exploration goals in older age and focusing on more emotional goals. This insight leads to the possibility that lower exploration would be associated with greater well-being in older age, whereas greater exploration, especially ruminative, would be more strongly negatively associated with life satisfaction.

## **Current Study**

Because of the historic focus on adolescence and young adulthood in research on identity, it is unclear if and how mean scores of commitment and exploration processes vary across the adult lifespan, and how they are related to satisfaction with life beyond young adulthood. In the current study, we will examine four main questions regarding age patterns using cross-sectional data covering the adult lifespan (i.e., 18 to 97) among individuals residing in the United Kingdom.

First, we will examine whether the measure we use (the DIDS; Luyckx et al., 2008) works similarly across the adult lifespan. We test measurement invariance using

moderated nonlinear factor analysis (MNLFA; Bauer, 2017). Unlike multiple group designs, MNLFA can test measurement invariance using multiple variables simultaneously, and allows for invariance testing across a continuous variable. This is especially important for a variable like age because traditional multiple group design of invariance testing, which employs a clustering of age groups, could obscure potential nuanced differences. Thus, it provides a powerful, flexible, and efficient means to testing invariance of a construct.

Second, we will examine age differences in identity commitment and exploration processes across the adult lifespan. Based on previous research, we hypothesize greater mean scores in commitment across age cohorts(e.g., Pulkkinen&Kokko, 2000). Previous research is less conclusive on age-related changes in exploration, but some research (Topolewska-Siedzik & Cieciuch, 2019) suggests

that exploration processes may peak in the twenties and then decrease through the rest of adulthood. Hence, we would hypothesize similar patterns, but with one exception. Topolewska-Siedzik and Cieciuch's (2019) oldest age group covered ages 49-65 and therefore they were unable to examine age differences that would potentially be related to retirement. Given that retirement marks a major life transition, and there is evidence for the adaptive role of exploration around earlier transitions (De Moor & Branje, 2023), we might anticipate elevated mean scores in exploration dimensions around retirement age.

Third, we will examine whether age differences in identity commitment and

exploration are moderated by gender. Although there is some work suggesting there may be gender differences in adolescence and young adulthood (e.g., Crocetti et al., 2011; Luyckx et al., 2008; Luyckx et al., 2015; Meeus et al., 2010; Verschueren et al., 2017) the findings are inconclusive, and it is not clear to which extent they transfer to later adulthood.

Fourth, we will test the degree to which identity processes are associated with life satisfaction across the lifespan. We hypothesize that the positive association of commitment with life satisfaction that is typically found may be stronger when such strong commitments become more of the norm in a particular age group. Similarly, exploration may be more positively (or put differently: less negatively) associated with satisfaction with life, in life phases in which individuals are exploring more heavily

(e.g., 20s and 30s, and again near retirement).

## Method

#### **Participants and Procedure**

We recruited participants through a third-party crowdsourced research firm (Cint) as part of a larger project. To be eligible for this study, a participant had to be 18 years of age or older and a resident of England. Quotas based on U.K. Census estimates for region, age and gender were established. Contextualizing our study, the U.K. is a highly individualistic culture, is relatively focused on long-term goals and virtues (e.g., placing value on long-term planning, versus more present-based orientations), and is low on uncertainty avoidance (the Culture Factor, n.d.). Half of young adult men start work at age 23, and half of young adult women at age 24 (Office for National Statistics, April 8, 2024). The average age of mothers at the birth of a child is 31, and 34 for fathers; the average age of mothers at the birth of their first child is 29. Retirement, defined as the date that one can begin to receive a state pension, is set at age 66.

We followed data cleaning procedures specified in the preregistration<sup>2</sup>. We first screened for evidence of careless responding (e.g., taking less than 5 minutes to complete the survey, evidence of response sets, self-reporting that they did not carefully or honestly answer the questions). We used the r package "careless" to identify potential outliers, which calculates indices of careless responding (Yentes & Wilhelm, 2018), such as maximum longstring values, intra-individual response variability indices, and Mahalonobis distances that span beyond a gap in the

distribution.

There were 7,239 survey clicks on the survey invitation, with 4,612 of these clicks

agreeing to participate after reading the participant information sheet. We removed

participants' data who abandoned the survey (*n* = 88), those who showed clear

<sup>&</sup>lt;sup>2</sup> Preregistration can be found at osf.io: https://tinyurl.com/ywhpw8vj. This pre-registration was made in conjunction with a larger project relating to gambling behavior and recruited a sample of individuals with past gambling involvement. We do not use this separate sample, nor do our analyses involve retrieving identity status classes through Latent Profile Analysis. Additionally, the age groups that we stated in the pre-registration differ from what we report. However, as a robustness check, analyses using these age groups did not yield results that would meaning fully alter our findings or their interpretation. Further, based on reviewer suggestions, we tested measurement invariance of age, measured by a continuous variable, rather than age group analyses as stated in the pre-registration. Thus, we consider this pre-registration to be valid for the current study with respect to data-cleaning and procedures pertaining solely to invariance testing of identity dimensions, and have included the pre-registered results on OSF.io. However, the main analyses with respect to age-differences in identity processes, and the associations between identity and well-being were not explicitly covered by the preregistration. Datasets, syntax, and outputs are available on OSF: https://tinyurl.com/5n8v5rpt (Weller et al., March, 2025)

evidence of straight-lined responding throughout the survey (n = 106), and those who self-stated that they did not respond honestly or carefully (n = 54). Continuing to follow our data retention criteria (e.g., completion duration > 5 minutes, using the r careless package to further identify problematic cases such as low variability/straight-lining), we removed 495 additional participants. We retained a final sample size of N = 3,869. Median age was 48 years (range = 18-97), 49.5% men, 49.9% women, 0.5% transgender/non-binary/preferred to self-describe, 0.1% did not report<sup>3</sup>. Participants were primarily of white-U.K. origin (88.4%); 3.0% reported Black/African/Caribbean ethnicity, 0.3% Asian, 2.5% mixed ethnicity, 0.5% reported another ethnicity, and 0.8% did not respond. With respect to highest attained education level, 3.0% did not complete a secondary school education, 33.0% completed secondary school, 19.9%

education, or have completed a bachelor's degree, and 11.2% reported some

graduate/ professional degree.

## Measures

Identity dimensions. Participants completed the Dimensions of Identity

Development Scale-short form, based on an Item-Response Theory testing (Johnson

<sup>&</sup>lt;sup>3</sup>Because of the small number of those reported gender other than men/women, we restrict our analyses to men-women comparisons when we test for gender differences.

et al., 2021) of the original DIDS (Luyckx et al., 2008). This measure includes five dimensions: Commitment-making, identification with commitment, ruminative exploration, exploration in breadth, and exploration in depth<sup>4</sup>. Each dimension was assessed with three items, and participants responded on a 1 (strongly disagree) to 5 (strongly agree) Likert scale. Because the project was embedded in a larger project and because of the high degree of redundancy between items, we only included two items for the identification with commitment and the exploration in depth scales (see Table 1 for summary statistics and reliability estimates).

Satisfaction with Life. Participants also completed 4-items<sup>5</sup> from Diener et al. (1985)'s Satisfaction with Life scale, also on a 1 (strongly disagree) to 5 (strongly agree) Likert scale, "I am satisfied with my life", "the conditions of my life are excellent", "So far I have gotten the important things I want in life", and "If I could live

my life over, I would change almost nothing".

#### **Data Analytic Plan**

<sup>4</sup>Two items from the DIDS-SF were omitted from the survey due to human error. The items that were not included were similar to retained item, though. Specifically, for exploration in depth, the omitted item was "I think about whether the aims I already have for life really suit me" compared to the retained: "I think about whether my future plans match what I really want.", and for Identification with Commitment, the omitted item was "I sense that the direction I want to take in life will really suit me", compared to the retained "I am sure that my plans for the future are right for me."

<sup>5</sup> Although the original SWL measure contained 5-items, we omitted *"If I could live my life over, I would change*" almost nothing", traditionally item 5) due to time constraints. Research supports that this item shows the weakest contribution to the total SWL score, and has correlated error variance with item 4 ("So far I have gotten the important things I want in life"; Clench-Aas et al., 2011; Glaesmer et al., 2011; Hanzlová et al., 2022; Hinz et al., 2025). Additionally, we tested the measurement invariance of the 4-item measure across age groups. We found evidence for partial scalar invariance for the SWL, by relaxing one item. Results can be found at <a href="https://tinyurl.com/5n8v5rpt">https://tinyurl.com/5n8v5rpt</a>.

We first conducted correlational analyses in the full sample to test the overall relationships between the identity dimensions, followed by their associations with age and gender. Prior to testing for age differences, we conducted invariance testing for the identity dimensions across age, which was treated as a continuous variable.

We assessed measurement invariance for age and gender using moderated non-linear factor analysis (MNLFA; Bauer, 2017a, b). MNLFA can simultaneously test a covariate's moderation with an item's factor loading (satisfying metric invariance) and intercept (satisfying scalar invariance)., assessing differential item functioning (DIF), which refers to when an item functions differently for different groups, potentially indicating bias (e.g., Bauer, 2017; Kolbe et al., 2024). Perhaps even more importantly for the goal of the study, it also allows for treating age as a continuous

variable which allows to circumvent issues inherent to categorical approaches to age

differences. We followed the procedure specified by Bauer (2017), following which we first specified the model for each identity dimension. Then we estimated the model parameters for means and variance, and the impact of the covariates on factor means and variances. In the third step, we tested for DIF for each scale item independently. This involved testing the moderated effect between a covariate (i.e., age) and both the (a) factor loading, and (b) intercepts. For partial metric and scalar invariance to be met, at least two invariant parameters of a kind were needed to establish partial invariance (e.g., for partial scalar invariance, we would need at least two of the intercepts to be set equal). Due to the multiple tests being conducted, we applied the

Benjamini-Hochberg correction for false discovery rates for each factor, setting the false discovery rate at .05 (Benjamini & Hochberg, 1995). Finally, we compared Bayesian Information Criterion (BIC) values from the item-specific DIF models to a model without any specified DIF to determine if the inclusion of the DIF path significantly improved model fit. Item DIF models that showed improvement of >=10 was retained. If a scale had multiple DIFs that improved fit, we respecified the model with both DIF paths. If the identity dimension yielded non-invariance at either the factor loading or intercept level, follow-up testing was conducted to test boundaries of measurement invariance, by progressively decreasing the age range of the measurement test by five years until significant non-invariance was met (i.e., analyses from age 18 to 77, then 18-72, and so on). When non-invariance was discovered, the analyses continued using the upper age of the last invariant model as the baseline (for

a similar approach, see Klimstra et al., 2020).

Our MNLFA tests also include age, gender and age × gender as predictors of factor scores, which allow for the simultaneous estimation of these effects for each identity dimension, minimizing the number of inferential tests, and thus reducing the likelihood of Type 1 errors when examining age differences. Finally, we examined the degree to which identity dimensions were associated with life satisfaction. Like the age differences analysis, we tested the degree to which the age groups differed in life satisfaction, and whether gender moderated this effect with a linear regression analysis.

#### **Results**

Correlations between Identity Processes, Age, and Gender

We first examined the degree to which the DIDS scales were associated with each other. Consistent with past research (Luyckx et al., 2008), we observed strong correlations between commitment-making and identification with commitment scales (Table 2). Also, we found that the exploration scales (breadth and depth) were moderately correlated with each other and the commitment scales. Ruminative exploration was positively associated with the two other exploration dimensions and weakly inversely related to the commitment variables.

Age was inversely associated with the exploration-oriented variables, ranging from -.31 to -.42. In contrast, age only showed very modest associations with the two

commitment variables. In a similar vein, gender was not correlated with commitment

variables, but women on average reported higher on exploration-oriented identity dimensions.

#### Measurement Invariance of the DIDS-SF Scales

Because invariance testing can only be conducted on scales with more than two indicators, we focused our analyses on exploration in breadth, ruminative exploration, and a composite commitment variable because of the high correlation between the two commitment scales in this study (r = .69; also observed in prior research, Klimstra et al., 2013; Luyckx et al., 2008)<sup>6</sup>. Table 3 shows the results of the invariance testing for these DIDS-SF scales.

*Exploration in Breadth.* We found some evidence for age-related moderation of factor loadings on two items, suggesting metric non-invariance (i.e., unequal factor loadings across ages), as well as significant DIF effects for two items, suggesting scalar non-invariance: Older participants were more likely to endorse "I think about different things I might do in the future", and less likely to endorse "I am thinking about different lifestyles that might be good for me." Given these issues, we adopted the alternative strategy of examining the age ranges in which invariance could be obtained. Our analyses suggested partial scalar invariance from ages 18 until 47 years (controlling for item 4 DIF). To maintain continuity, we began the next set of MNLFAs with individuals 43 years and older (i.e., the starting age of the last 4-year epoch in the

prior analysis). We found full metric and partial scalar invariance (also accounting for Item 4 DIF) from 43-72 years, and then full metric and scalar invariance from age 68 until the maximum age in the sample (see Supplement Online Information Table SI-1 for these models).

Ruminative exploration. The MNLFA yielded no significant gender interactions,

and only one age interaction, for the factor loadings of each item. We did find some

<sup>&</sup>lt;sup>6</sup>We chose not to create a composite for exploration in a similar manner based on theoretical and empirical reasons. For example, for the two exploration dimensions research suggests that there are more distinct age-related patterns than there are for the two commitment dimensions (Luyckx et al., 2013).

significant age-related linear moderation of the intercepts. Age was positively associated with endorsement of the item "I keep looking for the direction I want to take in my life" (item 7), but negatively associated with "I worry about what I want to do with my life" (item 6). However, BIC comparisons of DIF models to baseline suggested that only the inclusion of item 7 DIF would improve fit, and thus, only retained the DIF of this item for our analyses in the full sample.

*Commitment composite*. Because the commitment composite scale had five indicators, we first fit a one-factor CFA model, which achieved acceptable model fit (See Supplemental Online Information Table SI-2) The configural model, which was tested across age groups, clustered in 4-year spans<sup>7</sup>, showed acceptable goodness of fit across the entire sample, with CFI, TLI, and SRMR values being in the acceptable range, though RMSEA values indicated poorer model fit. We then used MNLFA in the

overall sample to test metric and scalar invariance for age and gender simultaneously.

Our results revealed no metric non-invariance for either age or gender. Gender was not associated with DIF on any items. However, we did find age-related DIF for four of the items: Two items were endorsed more in younger participants (Item2, "I have plans for what I am going to do in the future" and Item 8 "My future plans give me self-confidence"), whilst two were endorsed more in older participants (Item 3 "I know which direction I am going to follow in my life" and Item 5 "I have made a choice on what I am going to do with my life"). Examination of BIC values suggested that

<sup>&</sup>lt;sup>7</sup>The configural model was tested in this manner because it can only be tested with a multiple group design, as configural invariance is assumed in MNLFA.

accounting for DIF for only 3 items improved model fit compared to the overall model (items 2, 3 and 5), and thus, we consider this the final model.

In sum, we found at least partial scalar invariance across wide age ranges for each of the three dimensions. Although there were some differences in the range across dimensions, each dimension was invariant from age 18 until 42, through adulthood until at least 72 years of age, and then in later life.

#### Age and Gender Differences in Identity Processes

The MNLFAs allowed us to simultaneously examine age and gender differences in each DIDS-SF dimension, as well as potential non-linear age effects (i.e., quadratic and cubic effects) and the degree to which gender moderates these effects. Mean plots based on four-year epochs are presented in Figure 1 for illustrative purposes.

Exploration in breadth. Because the exploration in breadth scale showed

non-invariance across the adult lifespan, we present the age differences across three different periods (see Table 4). From 18 to 47 years, we observed a significant Age × Gender effect, in which women reported greater exploration in breadth earlier in adulthood, but less than men at the end of this period. In the second analysis (ages 43-72), we found a significant effect for age, irrespective of gender, in which older participants in this age group reported lower exploration. In the analysis with individuals aged 68 and above, we observed no significant age, gender, or interaction effects. *Exploration in depth.* Because this scale only included two items, we could not test for measurement invariance. Taking a conservative approach given the non-invariance observed with exploration in breadth, we conducted regression analyses that paralleled the exploration in breadth age ranges. Similar to exploration in breadth, age differences for exploration in depth were also observed in both the 18-47 and 43-72 age range analyses, B = .18, SE = .07, p < .01, and B = .33, SE = .05, p < .001), until the 68–72-year-old group (Panel B). However, no age effects emerged in the oldest cohort analyses, B = .18, SE = .07, p = .62. We also found a significant main effect for gender in the age 18-47 analyses, but the effect size was small, B = .06, SE = .03, p = .035. No other gender effects or age × gender interactions were observed in any analysis.

Ruminative exploration. We found significant main effects for age, with older

adults reporting less ruminative exploration than younger adults. Additionally, women

were more likely to report higher ruminative exploration overall, but this effect was

small. The interaction effect was not significant (Panel C).

*Commitment composite*. Accounting for DIF, our analyses found no main effects for age of gender differences in commitment. However, we did find a significant age × gender interaction. For men, average commitment scores were reported across the sample. In contrast, women who were older reported lower commitment than younger women.

Associations between Identity Processes and Satisfaction with Life across the Lifespan

Our final set of analyses tested the degree to which identity processes were differentially associated with life satisfaction across the adult lifespan<sup>8</sup>. We first conducted correlational analyses in the overall sample, and then conducted a linear regression analysis, which regressed SWL scores on the four identity processes, age, gender, along with all 2-way interaction terms between identity processes and both age and gender, and 3-way interaction effects for age × gender × identity process<sup>9</sup>. We first examined the correlations between identity processes and SWL scores (see Online Supplemental Information Table SI-3 for correlations by age group). Commitment was positively associated with life satisfaction, r = .41, <.001, and the association appeared to be strongest in late-middle adulthood. Both exploration in depth (r = .16, p < .01) and exploration in breadth (r = .05, p < .01) were also positively associated with SWL scores, however the latter effect was trivial. In contrast,

ruminative exploration was negatively associated with SWL scores in the overall

sample, *r*= -.26, *p* < .001.

Finally, we tested the degree to which age and gender moderate the

associations between identity processes and life satisfaction (see Table 5). The

model accounted for 24.6% of the variance in SWL scores, *F* (18,3829) =69.11, *p*<.001.

We found that ruminative exploration (-), exploration in depth (+) and commitment (+)

uniquely contributed to explaining the variance in SWL scores. Notably, we found the

<sup>&</sup>lt;sup>8</sup>MNLFA was conducted for the SWL scale. Our analyses found partial metric and scalar invariance for age. Results can be found on osf.io at <u>https://tinyurl.com/5n8v5rpt</u>.
<sup>9</sup>We also tested for quadratic age effects, however, no significant effects were found. Thus we do not discuss this issue further.

age moderated these effects (see Figure2). Specifically, for older adults, high commitment is related to greater life satisfaction, compared to younger cohorts with high life satisfaction (Panel A). We found a different pattern of results for the exploration variables. For exploration in depth (Panel B), we found that high exploration in depth was associated with greater SWL scores in younger participants, but this association was weaker for older participants. Finally, we found a somewhat reverse pattern for ruminative exploration (Panel C), in which older adults with low ruminative exploration report the greatest life satisfaction, and those older adults with high ruminative exploration report the lowest. We did not find any significant interaction effects between age and identity dimension. A main effect for gender was found, with women reporting greater satisfaction with life; however, this effect was small. No significant gender × identity process interactions were found, nor were any

gender × identity process interactions.

# Discussion

Although the dual-cycle identity approach suggests a dynamic pattern of identity-related exploration and commitment across the lifespan, it is still unclear to which degree (a) age-related differences can be observed, (b) there are gender differences in identity processes in different age groups, and (c) these dimensions may be associated with psychosocial well-being during different life periods in the same or different ways. We examined these questions with a large community sample, first assessing the degree to which our identity measurement (the DIDS; Luyckx et al., 2008) was invariant across the adult lifespan. Whilst our analyses did not demonstrate full measurement invariance over the entire adult lifespan, they did indicate that invariance was achieved across large adjacent age ranges, which allowed us to make age-related comparisons. Central to our study, age differences manifest for all types of exploration (i.e., in breadth, in depth, and ruminative), with lower exploration being reported in older ager groups. However, our analyses suggest a more complex pattern for commitment. Although no age differences in commitment were observed between early and middle adulthood, we did observe that older individuals reported lower commitment between middle to late adulthood. Additionally, we found that commitment and exploration in depth were consistently positively associated with life satisfaction, whereas ruminative exploration negatively predicted life satisfaction scores. For exploration in breadth, the results were inconsistent across the age

groups. Finally, although gender differences in identity processes were observed in some age groups, most notably for ruminative exploration, gender largely did not moderate the associations between age and identity processes; it also did not significantly moderate the association between identity and life satisfaction. *Differences in Measurement Invariance* To accurately assess age-related differences in a sample with such a broad age-range, a prerequisite and oft-overlooked step is to establish measurement

invariance. Overall, we found that all tested identity processes showed some degree of

measurement invariance across the adult lifespan. However, we found a notable

difference between the exploration in breadth scale and the other scales. Specifically, we found evidence that both the commitment composite and ruminative exploration showed partial scalar invariance across the full sample. In contrast, exploration in breadth only demonstrated partial scalar invariance from 18 until about 47 years, then from 43 until 72 years, and again from age 68 until the oldest age group in our study. It should be noted that for the former two invariance tests, the same item "I think about different things I might do in the future", needed to vary across age. Speculatively, this difference could arise from interpretation of the word "things" as they relate to the "future". Older individuals seem to more often endorse this item, which might represent a difference in temporal construal and an appreciation for their time remaining (Carstensen et al., 2024) in which younger participants think more abstractly about this item (e.g., "What are things I want to do in my life?"), whilst older

adults construe this item more concretely (e.g., "What are things I want to do during

the next few months?"). More broadly, we opine that the ruminative exploration scale

showed the greatest degree of measurement invariance due to its overlap with

negative affective traits such as neuroticism, which have also been found to be

age-measurement invariant (e.g., Mõttus&Rozgonjuk, 2021).

Age and Gender Differences in Identity Processes

Contrary to our expectations, we did not find greater mean scores for the

combined commitment dimension from younger to older individuals. At the surface,

this finding contrasts with prior research on age-related differences (Luyckx et al.,

2013; Pulkkinen & Kokko, 2000). However, it should be noted that those studies included different age ranges than the present. For instance, Pulkkinen & Koko (2000) only covered ages 27 to 36 years, albeit longitudinally. Similarly, Luyckx et al. (2013) included participants from 17-30, but only 10% of the sample was above 22 years of age, and only 2.8% were 28 years or older. Furthermore, we found modest evidence that these age-related differences were moderated by gender, in which commitment was lower for women, but not for men. This finding may support an assertion made by Mehta et al. (2020), who suggest that a "career and care crunch" manifests during the period, in which work-life balance demands become the most prominent. This phenomenon may be experienced more greatly by women due to gender differences in societal expectation regarding care responsibilities (e.g., Löffler & Greitemeyer, 2023) and could manifest as lowering career-oriented commitments. This question spans

beyond the current research, but future endeavors may benefit from parsing identity

domains, such as career and home commitments (see Archer, 1989), across this developmental period.

Results regarding the exploration dimensions were more aligned with our expectations. Firstly, ruminative exploration showed linear, negative age differences across the entire sample, consistent with prior research in negative emotionality, indicating that individuals on average show decreases in negative affectivity, neuroticism, and worry as they get older (Bleidorn et al., 2022; Gonçalves &Byrne, 2012; Luyckx et al., 2013). Independent of age, women reported greater ruminative exploration across the entire adult lifespan, consistent with both adolescent and adult identity research (Luyckx et al., 2008, 2013, 2015). This finding is also supported by clinical research suggesting that women report ruminating more than men and may be especially susceptible to anxiety-related cognitive factors (Johnson&Whisman, 2013). Additionally, our results largely align with Topolewska-Siedzik and Cieciuch's (2019) study which suggests that positive aspects of exploration (i.e., breadth and depth) were less likely to be reported over the lifespan. More broadly, our results resonate with Carstensen's (1993) Socioemotional Selectivity Theory (SST), which suggests that exploration goals become deprioritized in favor of more emotionally relevant goals. Moreover, our results correspond to Mehta et al. (2020)'s conception of *established adulthood* (i.e., the ages between 30 and 45), a period in which

in their careers. They may also make decisions about having children, and perhaps providing care for ageing parents. Our finding that gender moderates the relationship between age and exploration in breadth, with women reporting lower exploration toward the end of this age period, especially resonates with this point. As we did not find the predicted changes in commitment, but did find age differences in both positive and negative aspects of exploration, our work suggests that it is not so much commitment that increases, but that instead the reflection on, and questioning of, those commitments may decrease in this period of increased responsibilities. Note that increased responsibilities could either directly reduce the perceived viable option

commitments become strongest as individuals experience increasing responsibilities

for exploration, or more indirectly affect exploration as the cognitive resources that were used for this earlier in life may now be taken up by these responsibilities. The idea that general resources available to an individual affect identity formation is a key premise of the identity capital model used to explain identity formation in younger age groups (Côté, 2002).

Life Satisfaction

Across individuals of all ages, life satisfaction was positively associated with commitment and exploration in depth, and negatively associated with ruminative exploration. Given the dearth of supporting literature, we initially proposed a norm-based hypothesis in which the strength of associations between identity processes and life satisfaction would be strongest in periods that coincided with age-related identity norms for exploration (e.g., 20s-30s and retirement) and for having

strong commitments (30s and older). However, our results were mixed. Supporting norm-based assertions, our analyses suggested that exploration in depth was more strongly associated with life satisfaction for younger participants, and less so for older cohorts. Additionally, we found that ruminative exploration was descriptively more strongly associated with greater life satisfaction for older adults. Thus, life satisfaction seemed to be more strongly tied to those who reported greater ruminative exploration during a period in which having strong commitments and few intentions to change those may be perceived as the norm. Also, the commitment-life satisfaction association seemed to be stronger in older adulthood, though this association was also apparent in younger adults.

These results are largely consistent with Luyckx et al. (2013), which found that correlations between depressive symptoms and identity processes, especially commitment making and exploration in breadth, were stronger during the late 20s, compared to adolescence. As individuals age, though, they may be concerned less about identity-related exploration, which may be classified as "preparatory goals" (e.g., acquiring knowledge, exploring new directions in life; Carstensen, 1993). This lessened concern may be reflected in the association of exploration in breadth and depth with life satisfaction being non-significant in later adulthood. Instead, older adults tend to focus more on a sense of belonging, feelings and emotional satisfaction. Similarly, Erikson (1950/1993) suggested that older adults would be more concerned with

ego-integrity than younger individuals, with the flip side of that being despair. Thus, the norm may be to worry less and hold on more to one's commitments. Our findings seem supportive of these arguments by suggesting that low commitment and high ruminative exploration are particularly associated with lower life satisfaction in older age groups. It should be noted that life events may impact both identity commitments and life satisfaction independently. Such cases might represent situations in which strong commitments are diminished, even if the individual desired to maintain them. These effects may exist in older age (e.g., related to bereavement or physical illness), but also in other ages (e.g., related to divorce or job loss).

Lastly, gender was examined as a moderator of the association between age and life satisfaction. Our results suggested no meaningful effects of gender, either as a main effect or a moderator of identity processes. were observed. Although we observed a significant association between gender and ruminative exploration, ruminative exploration appeared to be associated with life satisfaction similarly for men and women across the adult lifespan.

#### **Directions for Future Research**

Although our results provide promising evidence that explain the degree to which identity processes change over time, we must acknowledge several limitations. Most obvious is the use of a cross-sectional study to test for age differences. Although cohort differences can illuminate potential effects of aging, they cannot substitute for longitudinal designs. For instance, parenting practices, social norms

regarding exploration and commitment, gender differences in all of these, and many other cohort differences may exist, which may be reflected in our results (Baltes, 1987). With respect to our results linking identity with life satisfaction, a longitudinal design would have the potential to examine the theoretically-proposed dynamic interplay between commitment and exploration, and predictors of such fluctuations. It could also help to illuminate the degree to which age-related changes in life-satisfaction may co-occur with changes in identity process. Further, the design thus limits our ability to make conclusions regarding how these dimensions may change over time in general, not to mention the degree to which heterogeneity in such trajectories may exist. Such heterogeneity is important to identify, as research on different constructs has shown that specific trajectories can be risk factors for maladaptive behaviors, such as substance use and antisociality (e.g., Garofalo et al., in press; Weller et al., 2021).

We must acknowledge that the sample was relatively homogenous, with respect to race and ethnicity. Whilst we made efforts to sample based on U.K. Census estimates for age, gender and region, 81.7% of residents report white racial identity. Our sample was roughly in line with this figure, albeit slight over it. Thus, issues regarding generalizability need to be evaluated in the context of future investigations, with more diverse samples. This being said, our sample included a large range of educational attainment and household income level, indicative of differences in social classes which also may relate to identity development, with even potentially stronger

effects in majority populations, as is the case in the current study (e.g., Aries& Sedler,

2007; McAvay&Safi, 2023).

In addition, we used the same measure across age groups, which has the advantage that it allows for direct comparisons of mean scores if measurement invariance is established (which was at least partially the case in this study). However, identity processes might present themselves in slightly different ways across age groups, with dimensions capturing readjustment and maintenance of identity commitments potentially being relevant in very old age (Kroger, 2002). As the DIDS measure was designed and validated in the context of research on adolescents and younger adults (Luyckx et al., 2008), the items likely do not fully reflect explorationand commitment-related thoughts, feelings, and behaviors that adults may experience as they age. Thus, the DIDS-SF may not fully capture the nuanced decision-making that an individual experiences over the adult lifespan, nor may it capture shifts in meaning over time as an individual is presented with different opportunities and challenges related to careers and families, for instance. As a caveat, developing scales with such sensitivity to age-specific elements would have consequences as well, because the use of different items for different age groups would mean that constructs are no longer directly comparable.

Moreover, in later adulthood, unique challenges (e.g., retirement, changes in family status) may impact an individual's sense of self and factors such as changes in physical functioning can play a role in this (Lodi-Smith & Roberts, 2010). Naturally,

capturing all of these decisions and events across the entire adult life span and the covariates that may predict them would extend beyond the scope of a single study. However, we hope that the current study sparks future research aimed at addressing these issues, albeit across narrower age ranges. In addition to longitudinal work, future studies could employ a qualitative design (e.g., interviews analyzed with, for example, thematic analysis) to examine whether there are such age-specific manifestations of identity and what they look like.

Related to the previous points, the version of the DIDS we used only focuses on the domain of future orientation. Previous longitudinal research on identity formation in adulthood (Fadjukoff et al., 2016) found different developmental trajectories for different identity domains. Specifically, for men changes in the religious domain went in the opposite direction compared to other domains such as politics and occupation. Versions of the DIDS tapping into identity domains other than future orientation are available (e.g., career plans and romantic relationships; Luyckx et al., 2014) and others could be developed. Hence, differential age trends across identity domains could be explored in future research using alternative version of the DIDS.

Further, the dual-cycle approach posits non-linearity in expression of the identity processes over time, which could provide future opportunities to examine covariates that may not only precede, but also coincide with and follow, elevations in exploration and commitment. Related, the dual-cycle model approach emphasizes the dynamics between identity processes cross-sectionally in addition to longitudinally. A

group-differential approach (e.g., constructing identity clusters based on the DIDS dimensions, e.g., Verschueren et al., 2017) would be needed to capture the co-occurrence of different dimensions and would give more insight into the adaptiveness of identity (e.g., whether individuals are exploring in the presence or absence of existing commitments). However, our current approach has some advantages over an identity-cluster based approach, especially for age-based comparisons. Specifically, age differences in the prevalence of identity clusters can be hard to interpret as subtle mean-score differences in the underlying dimensions may be overlooked. Also, the theoretical meaning of clusters with the same name across different studies varies (e.g., Negru-Subtirica & Klimstra, 2021), whereas mean-score differences between age groups can be interpreted less ambiguously.

Overall, the present study provides a comprehensive overview of age differences in identity processes across the adult lifespan. Although previous research has examined adult identity development, large-scale examinations of age trends using the same measure across the adult life span had not previously been conducted. Our findings suggest that such an approach is feasible from a measurement perspective and that it can yield intuitively sound and conceptually important findings. We hope that the present study will inspire more research on identity processes beyond the typically studied age groups of adolescents and young adults.

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	a (M		Std.
	interitem r)	Mean	Deviation
Commitment Making	.82 (.61)	3.39	.89
Identification with Commitment	.71 (.55)	3.39	.84
Exploration in Breadth	.71 (.45)	3.50	.77
Exploration in Depth	.59 (.42)	3.27	.91
Ruminative Exploration	.77 (.52)	3.16	.93
Satisfaction with Life	.83 (.57)	3.26	.92

Table 1. Descriptive statistics for variables of interest.

*N*=3869.

	1	2	3	4	5	6	7
1. Age							
2. Gender (men=0)	28**						
3. Commitment	06**	01					
Making							
4. Identification w/	08**	.00	.69**				
Commitment							
5. Exploration in	31**	.10**	.44**	.37**			
Breadth							
6. Exploration in	33**	.13**	.41**	.41**	.57**		
Depth							
7. Ruminative	42**	.16**	08**	07**	.48**	.39**	
Exploration							
**p<.01							

Table 2. Correlations between demographics and DID-SF scales.

58

Table 3 Measurement non-invariance identified by MNLFA for Identity Dimensions

Scale		DID-SF Item			
Exploration in Breadth	Item 1	Item 4	Item 10		
Factor Loading(SE)	.80**(.05)	.62** (.04)	<b>.69</b> **(.04)		
Loading DIF (SE)					
Age	.05**(.02)	06**(.02)	.04 (.02)		
Gender	.01 (.04)	.07 (.03)	03 (.04)		
Intercept DIF (SE)					
Age	.02 (.02)	.18** (.02)	17**(.02)		
Gender	03 (.03)	03 (.03)	.07 (.03)		
Model BIC(baseline: 29387.11)	29407.69	29282.27	29286.95		
Ruminative Exploration	Item 6	Item 7	Item 9		
Factor Loading(SE)	.81**(.04)	.87**(.04)	.65**(.03)		
Loading DIF (SE)					
Age	.01 (.02)	02 (.02)	.07**(.02)		
Gender	03 (.03)	.01 (.03)	.04 (.03)		
Intercept DIF (SE)					
Age	11(.06)	.20 (.03)	08 (.02)		
Gender	03 (.03)	01 (.04)	.02 (.04)		
Model BIC(baseline: 31199.27)	31196.69	31153.35	31197.10		
Commitment Composite	Item 2	Item3	Item 5	Item 8	Item 11
Factor Loading(SE)	.87**(.04)	.94**(.04)	.86**(.04)	.76**(.04)	.69**(.04)
Loading DIF (SE)					
Age	.01 (.01)	03(.02)	04(.02)	.04 (.02)	.03 (.02)
Gender	01 (.03)	.02 (.03)	01 (.03)	.02 (.03)	03 (.03)
Intercept DIF (SE)					
Age	12**(.01)	.07 **(.01)	.07**(.01)	06**(.01)	.03 (.04)

Gender	.02 (.03)	.00 (.02)	03 (.07)	.00 (.03)	.02 (.03)
Model BIC(baseline: 46633.09)	46558.416	46623.971	46619.485	46634.5	46656.61

Note. \*\*p <=.01. Parameter values in bold survived the sensitivity analysis for false discovery. BIC values<10 compared to the baseline (no DIF model) in bold.

# Table 4. MNLFA Estimates of Age and Gender Effects Predicting Identity Process Factor Scores.

Predictor	В	SE
Exploration in Breadth		
18-47 years		
Age	.16	.10
Gender	.10	.06
Age × Gender	16**	.06
43-72 years		
Age	17**	.09
Gender	.01	.06
Age × Gender	08	.06

68 years and older

Age	02	.18
Gender	06	.15
Age × Gender	06	.11

# Ruminative Exploration

Age	62**	0.07	
Gender	.12**	0.04	
Age × Gender	.04	0.04	

# **Commitment Composite**

Age	.02	0.06
Gender	07	0.04

Age × Gender08 0.04

\_\_\_\_

	В	Std. Error S	Std. Beta	Sig.
Age	.001	.001	.014	.383
Gender (1=women)	.066	.030	.036	.027
Commitment	.456	.030	.397	<.001
Exploration Breadth	046	.034	038	.177
Exploration Depth	.124	.027	.122	<.001
Ruminative Exploration	212	.027	210	<.001
Age × Commitment	.004	.002	.052	.048
Age × Exploration Breadth	002	.002	022	.445
Age × Exploration Depth	003	.002	053	.039
Age × Ruminative	006	.002	092	<.001
Exploration				
Gender × Commitment	081	.045	049	.074
Gender × Exploration	071	.050	041	.153
Breadth				
Gender × Exploration Depth	.029	.039	.020	.460
Gender × Ruminative	038	.038	026	.322
Exploration				
Age × Gender ×	001	.003	006	.839
Commitment				
Age × Gender × Exploration	001	.003	012	.676
Breadth				
Age × Gender × Exploration	.002	.002	.020	.454
Depth				
Age × Gender × Ruminative	.003	.002	.042	.133
Exploration				

Table 5. Regression Analysis Predicting Satisfaction with Life.

Note. N =3830. Identity and age variables mean-centered.

# Figure 1. Age Differences in Identity Dimensions, by Gender





-Men -Women



# Figure 1. Age Differences in Identity Dimensions, by Gender continued





Panel D



Note. For Exploration in Breadth, age-related invariance was found from ages 65 18-47, 43-72, and age 68-97. Please see Online Supplemental Information for details.

## Figure 2. Moderation Effects of Age × Identity Process on SWL scores



Panel B. Exploration in Depth × Age



Panel C. Ruminative Exploration × Age interaction



Note. Com=Commitment Composite. ED=Exploration in Depth. RE=Ruminative Exploration. Identity process variables mean-centered, and +/- 1 s.d. represented.