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and reduce loneliness**

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Together is better. Higher committed relationships increase life satisfaction and reduce
loneliness

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Abstract

Recently, the term mingle was introduced for persons with an intimate relationship who do not define themselves as romantic partners. This study examines differences between single, mingle and partnered adults in terms of life satisfaction and loneliness. Furthermore, need fulfillment is investigated as a mediator concerning the link between relationship status with life satisfaction and emotional loneliness. Lastly, a longitudinal analysis examined if increases in commitment lead to higher well-being. A total of 764 participants completed an online questionnaire. Mingles fell in between singles and partnered adults regarding emotional loneliness and life satisfaction. With regard to female participants, relatedness and competence need fulfillment fully mediated the link between relationship status and life satisfaction whereas the association between relationship status and emotional loneliness was specifically mediated by the relatedness and autonomy component. Finally, shifting into more committed forms of relationship increased well-being regarding the longitudinal analysis.

Keywords: well-being, relationship status, basic psychological needs, self-determination

Together is better. Higher committed relationships increase life satisfaction and reduce loneliness

Having a stable romantic relationship displays one of the most prominent roles individuals desire to achieve in their lives (Roberts & Wood, 2006). However, according to a report of the Federal Statistical Office in Germany (2016) the number of unmated individuals raised by 16% between 2004 and 2014. Given the increasing availability of online dating portals and slowly decreasing negative attitudes towards online dating (Finkel, Eastwick, Karney, Reis, & Sprecher, 2012), this trend seems surprising at first glance. Although social media and dating applications provide multitudinous opportunities of getting to know new people (Gibbs, Ellison, & Heino, 2006) and forming new romantic relationships, they might also undermine the formation of stable, committed romantic relationships: The virtual presence of many potential partners could inveigle some individuals not to commit to one partner as a consequence of a potential “fear of missing out” (Przybylski, Murayama, Dehaan, & Gladwell, 2013) of better alternatives. Additionally, with the multitude of potential partners it is not necessary to be in a stable relationship in order to have intimacy and sexual interactions (Poortman & Liefbroer, 2010). As a consequence, there seems to be a growing number of individuals who stay single or engage in less committed forms of relationship.

Recent studies investigated if increases in commitment lead to higher well-being. Kamp Dush and Amato (2005), for example, examined whether married individuals, cohabiting persons, individuals dating one person steadily, people dating multiple persons, and individuals not dating at all form a continuum of commitment with higher levels of commitment being associated with higher subjective well-being. What is missing from these recent studies is the investigation of more currently emerged types of partnership. As mentioned before, there is an increasing amount of individuals who form less committed forms of relationships called mingle. The term mingle is composed of the words “mixed” and “single” and implies that two persons share an intimate relationship with each other over a

certain period of time without fully committing to be romantic partners (Tesch, 2014). The fear of possibly missing out better opportunities, the importance of expressing one's own independence and the ease of getting to know new potential partners via social media or dating applications display some of the reasons promoting this new form of partnership (Poortman & Liefbroer, 2010).

Mingles can be distinguished from partnered individuals (i.e., individuals that are fully committed towards one another) by different locations on a "continuum of commitment" (Kamp Dush & Amato, 2005). Fully committing to a relationship reflects the relationship to be a fundamental part in a person's identity (Kamp Dush & Amato, 2005). Whereas partnered individuals feel truly committed to their partner, mingles share an intimate relationship while not definitely committing. Morris and Fuller (1999) also proposed a continuum of commitment to define different types of relationship formation. In their work, commitment is mentioned as the key element defining the current relationship status of adults. Mingle relationships, which are understood as an intimate relationship without committing to the partnership, can be compared to the relationship type "seeing each-other" in the article by Morris and Fuller (1999). People in this kind of partnership are perceived as dating one person regularly and sharing intimacy while not engaging in other intimate relationships to other persons. As opposed to friend with benefit relationships, which typically emphasize the sexual component of a partnership, mingles furthermore live like a romantic couple in their private lives while claiming to be single when in public. Mingles are, however, also expected to differ from single individuals on the commitment continuum: Mingles can best be perceived as individuals in rather low committed relationships whereas singles do not have any committed form of partnership at all.

Different levels of commitment, in turn, can be expected to be associated with differences in various indicators of well-being. For example, romantic relationship involvement is associated with greater life satisfaction (Umberson & Williams, 1999) whereas

the absence of social attachments is linked with extenuated mental health and diminished well-being (Baumeister & Leary, 1995). Moreover, relationship status plays an important role for loneliness as the absence of significant social relationships – especially in terms of lack of closeness and intimacy – leads to a greater perception of loneliness (Russell, Cutrona, Rose, & Yurko, 1984). Additionally, functioning romantic relationships fulfill important psychological needs (House, Landis, & Umberson, 1988). Whereas differences in life satisfaction and loneliness between single and partnered adults are well documented (e.g., Adamczyk, 2015; Adamczyk & Segrin, 2015), little is known whether mingles differ from partnered adults regarding these variables. The present study is the first to systematically investigate the difference between mingles and partnered individuals regarding life satisfaction, loneliness and psychological need fulfillment.

The next sections will be organized as follows: First, we will summarize prior research investigating differences between singles and partnered adults in life satisfaction and loneliness. We will further address the question whether mingles will be expected to be more similar to singles, to partnered adults, or to fall in between these two groups with regard to life satisfaction and loneliness. Next we will outline a potential mediator of group differences between mingles and partnered adults. Taking into account Self-Determination Theory (Deci & Ryan, 2000), fulfillment of basic psychological needs through the romantic partner will be discussed as a factor potentially driving differences between mingles and partnered adults in life satisfaction and loneliness. In a cross-sectional study with more than 700 participants in an online survey we will then examine group differences in life satisfaction, emotional loneliness, and need fulfillment between mingles and adults in committed relationships. We further supplement these results by longitudinal analysis to examine whether shifting into higher committed relationships increases well-being and leads to lower feelings of emotional loneliness.

Relationship Status and Life Satisfaction

There is a large body of research investigating life satisfaction among married individuals, individuals in other committed relationships and singles showing that marriage and stable romantic relationships are associated with higher life satisfaction (Braithwaite, Delevi, & Fincham, 2010; Simon & Barrett, 2010; Uecker, 2012). Married individuals and people in a committed relationship are emotionally more satisfied compared to single individuals (Coombs, 1991). Needs for love, intimacy and sexual gratification are typically fulfilled to a much higher degree in stable relationships, and studies examining the differences in life satisfaction among single and partnered adults find an advantage for individuals in a stable romantic relationship (Adamczyk, 2015).

Mingles have an intimate relationship with one person while not fully committing to the partnership. This group can be characterized by a lower commitment and romantic involvement compared to people in a stable relationship. Romantic involvement is associated with a more positive self-concept (Campbell, Sedikides, & Bosson, 1994) which may lead to a greater life satisfaction, as people in a committed relationship receive higher levels of confirmation from their current partner compared to mingle adults. Single adults, in turn, lack this source of confirmation since they are not in any form of romantic relationship. Building on this argumentation, these three groups are expected to align on a continuum of commitment and, consequently, to experience increasing levels of life satisfaction with increasing commitment levels.

Relationship Status and Loneliness

Loneliness can be defined as a feeling of distress arising from deficiencies regarding social relationships (Perlman & Peplau, 1984). Given the centrality of committed romantic partnerships among other forms of social relations, it is not surprising that a lot of research has been conducted to investigate the role of relationship status on loneliness (Russell, Peplau, & Cutrona, 1980). On a conceptual level, Weiss (1973) differentiated between social and emotional loneliness. The first dimension of loneliness emerges from the absence of a

network of social interactions with others whereas emotional loneliness arises from the lack of a truly intimate tie, usually with a romantic partner, parent, or child (Green, Richardson, Lago, & Schatten-Jones, 2001). Adamczyk (2015) could identify differences between single and partnered adults with the former reporting higher levels of emotional loneliness, but not social loneliness. The lack of a stable romantic relationship plays a major role in explaining higher perceived emotional loneliness among single individuals who have no partner to share love and intimacy with (Rokach & Brock, 1998).

Since mingles form a more superficial relationship in which they do not fully commit to the partner, they probably keep an emotional distance from this person, for example to minimize the negative impact of a possible rejection. Concerning a continuum of commitment, being in a stable relationship is a more profound basis of one's own identity than being in a mingle partnership and being mingle, in turn, is a more salient basis for personal identity than being single (Kamp Dush & Amato, 2005). Concluding, emotional loneliness should be highest for single adults, followed by mingles and partnered individuals. With regard to social loneliness, we expect no differences between singles, mingles and partnered individuals.

Relationship Status and Need Fulfillment

Self-Determination Theory (SDT) assumes that there are three essential needs whose fulfillment is necessary for optimal psychological functioning and well-being: autonomy, competence, and relatedness (Deci & Ryan, 2000). Autonomy refers to the extent to which one's actions are perceived as voluntarily and freely chosen. Competence describes the feeling of being effective and capable of obtaining desired results. Relatedness refers to having close and caring relations to other human beings. SDT assumes that fulfillment of all three basic needs is a precondition for well-being (Patrick, Knee, Canevello, & Lonsbary, 2007). This assumption was confirmed in studies showing that fulfillment of all three needs is linked to higher life satisfaction and lower depression as well as lower loneliness

(Vansteenkiste, Lens, Soenens, & Luyckx, 2006; Wei, Shaffer, Young, & Zakalik, 2005). Of note, fulfillment of these three needs has been postulated to be associated with higher well-being for all individuals, regardless of inter-individual differences in culture, age, or gender. That is, although individuals may differ in the degree to which they value fulfillment of these needs or pursue fulfillment of these needs, such differences typically fail to moderate the strong positive effects of need fulfillment (e.g., Sheldon, 2011; Chen et al., 2015).

Need fulfillment and need frustration are experiences that individuals can have in many different settings and roles, one of which is in their romantic relationships. In fact, fulfillment of the needs for autonomy, competence, and relatedness within close and romantic relationships plays an important role in predicting life satisfaction and loneliness. La Guardia, Ryan, Couchman and Deci (2000) revealed a positive association between need fulfillment through a significant partner and well-being. Patrick et al. (2007) found that the fulfillment of each need through the partner was individually linked to greater life satisfaction, with relatedness displaying the most influential predictor. Hence, previous research shows that fulfillment of all three needs in relationships is related to indicators of well-being. Again, assuming mingles and partnered individuals to differ on a crucial dimension describing the relationship – commitment – we also expect that differences in well-being between these two groups will at least partially be mediated via differences in need fulfillment.

The Current Study

The purpose of the present study is to analyze associations of participants' relationship status with life satisfaction, loneliness and need fulfillment. More specifically, we pursue the following aims: First, this is to our knowledge the first study which examines mingle adults regarding their life satisfaction, loneliness and need fulfillment. Based on previous research (Adamczyk, 2015; Braithwaite et al., 2010) – conceptualizing mingles lower on a commitment continuum than partnered adults – we delineated following hypotheses: Specifically, we expected that adults in a committed relationship (compared to mingle

individuals) would experience higher levels of life satisfaction and lower levels of emotional loneliness. Specifically, we expected mingle adults to fall in between singles and partnered adults in terms of both life satisfaction (hypothesis 1) and emotional loneliness (hypothesis 2).

Second we are interested in uncovering the processes which account for the hypothesized discrepancy between mingles and individuals in a committed relationship. It was expected that mingles would report lower levels of need fulfillment through their romantic partner than adults in a committed relationship (hypothesis 3). Furthermore, need fulfillment through the partner was expected to act as a mediator between relationship status and life satisfaction (hypothesis 4), with fulfillment of all three needs mediating group differences in life satisfaction. For the difference in emotional loneliness, we expected that primarily the fulfillment of the need for relatedness (but not competence and autonomy) would mediate the effect of relationship status (hypothesis 5). This hypothesis is derived from prior research that has tied loneliness specifically to the lack of relatedness fulfillment (Neubauer & Voss, 2016).

Lastly, we compare two competing hypotheses regarding the direction of the postulated association between relationship status and our investigated outcomes: The selection perspective emphasizes the tendency of individuals with higher levels of mental health or well-being to choose relationships with higher levels of commitment (Lamb, Lee, & DeMaris, 2013). According to this account, happier and healthier people are more likely to be selected into marriage (Horwitz, White, & Howell-White, 1996). To rule out the possibility that differences in life satisfaction and emotional loneliness between the types of relationship status could be due to selection effects, we used a longitudinal design to investigate if shifting into higher committed relationships increases life satisfaction and reduces emotional loneliness. In our longitudinal analysis we want to address the question if transitions in relationship status lead to changes in emotional loneliness and life satisfaction. Increased

commitment should go along with higher prospective life satisfaction and lower emotional loneliness whereas the opposite should be true for decreases in commitment.

Method

Sample and Procedure

An online questionnaire was used for data collection. The link to the questionnaire was sent via e-mail to members of a participant pool at a large German university. Students from different disciplines are registered on this platform and are informed about current empirical studies which they can attend. Furthermore, Facebook was used to reach a great number of participants. Nine-hundred-ninety-six people started the questionnaire; 779 (78%) completed the survey. Data from 15 participants were identified as outliers and discarded, yielding a final sample of 764 participants ($M_{\text{age}} = 28.3$ years, $SD = 7.2$, range = 17-59; 62% female).

Two-hundred and forty-four ($M_{\text{age}} = 27.4$ years, $SD = 8.3$, range = 17-58; 75% female) of the 764 adults completed a similar online survey one year prior to this study (further referred to as T0). For these study participants, longitudinal information on relationship status, life satisfaction and emotional loneliness is available, too.¹ The remaining 520 participants had not been approached for the assessment wave at T0. Unless otherwise stated, the following information refer to the second measurement occasion (further referred to as T1) with $N = 764$.

Measurements

Demographic questionnaire. In addition to age, gender and level of education, we also assessed the current relationship status and duration of this status. To identify relationship status, participants could choose between three answer options: “I am in a steady relationship” (partnered; $N = 372$; 48% of the whole sample), “I am not in a steady

¹ We used Little’s MCAR test to reveal the mechanism leading to missing values. In our model we integrated all relevant variables used in the longitudinal analyses. These were relationship status at T0 and T1, mean life satisfaction and mean loneliness at T0 and T1, age, gender and duration of relationship status at T0 (three dummy coded variables due to four categories). The test suggested the missing values to be missing completely at random, $\chi^2(6) = 6.29, p = .392$.

relationship, but I have an intimate relationship with one person” (mingle; $N = 111$; 15%) and “I am not in a steady relationship” (single; $N = 281$; 37%). To determine the duration of being single, mingle or partnered, the participants were asked to respond to the question: “For how long has your current relationship status been unchanged?” Four possible responses were given (1 = “less than 6 months”, 2 = “between 6 and 12 months”, 3 = “between 12 and 24 months”, 4 = “more than 24 months”).² Further information on demographics can be found in Tables 1 and 2.

Life satisfaction. To assess participants’ current life satisfaction, the German translation (Glaesmer, Grande, Braehler, & Roth, 2011) of the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) was applied. Participants could indicate how much they agree or disagree with each of the five statements on a scale ranging from 1 (“totally disagree”) to 7 (“totally agree”). A sample item is: “In most ways my life is close to my ideal”. Internal consistency for the SWLS was high ($\alpha = .87$).

Loneliness. Two items were used to measure specific forms of loneliness. Social loneliness and emotional loneliness were measured by two items that were adopted from Russell et al. (1984). Both types of loneliness were described in 2-3 sentences and the participants should complete the sentence “I feel this kind of loneliness...” on a 9-point Likert-type scale (1 = “not at all” to 9 = “very strongly”) to indicate how strongly they felt the described type of loneliness.

Need fulfillment. The Need Satisfaction in Relationships Scale (La Guardia et al., 2000) was assessed to indicate the extent to which people feel supported by their current partner concerning their autonomy, competence and relatedness needs. Each need was assessed by three items using a 7-point Likert-type scale (ranging from “totally disagree” to “totally agree”). This scale was only administered to those participants who reported to be

² The variable duration of being in the current relationship status originally consisted of six categories which we subsumed into four categories to circumvent issues of small cell sizes.

partnered or mingle because single individuals do not have a romantic partner through whom their need could be fulfilled (since singles do not have a romantic partner, need fulfillment through a partner is nonsensical). We introduced the scale by specifying that the following items refer to the partnership which the participants indicated earlier in the study. Sample items are “When I am with my romantic partner, I feel free to be who I am” (autonomy), “When I am with my romantic partner, I feel very capable and effective” (competence) and “When I am with my romantic partner, I feel loved and cared about” (relatedness). Internal consistency for the three scales was acceptable, with $\alpha = .69$ (autonomy), $\alpha = .63$ (competence), and $\alpha = .79$ (relatedness), respectively.

Commitment. Participants who reported to be either partnered or mingle were additionally asked to indicate how much they agree with the following three items on a 7-point Likert scale (ranging from “totally disagree” to “totally agree”): (a) “I am committed to my current relationship”, (b) “I want the relationship to last forever” and (c) “I am oriented toward the long-term future of my relationship (e.g. I imagine being with my partner several years from now)” (see Fletcher, Simpson, & Thomas, 2000, for Item 1; see Rusbult, Martz, & Agnew, 1998 for Item 2 and Item 3). Internal consistency was high ($\alpha = .88$). Again, commitment was not assessed for single individuals because - by definition - they do not have a relationship to which they can be committed.

Data Analyses

Our statistical analyses consist of three parts. First, the mean differences between single, mingle and partnered adults concerning the dependent variables in the cross-sectional data set were analyzed using two-way analyses of covariance (ANCOVAs) with the factors relationship status (single, mingle, partnered adults) and gender (male, female). To interpret the effect sizes, eta-squared is reported. We added gender as an additional factor to further explore possible differences between male and female participants and to investigate interaction effects between gender and relationship status. Moreover, we controlled for age as different experiences may

be related to age and could affect our analysis. Lastly, we added the duration of being in the current relationship status as covariate. In every model, relationship status, age, duration of relationship status (dummy coded), gender and the interaction term between gender and relationship status are integrated. To test our hypotheses, we used polynomial contrasts and post-hoc comparisons, after running the ANCOVAs. Linear and quadratic contrasts for the factor relationship status were tested. Expecting the three groups to lie on a continuum of commitment, our hypotheses regarding differences in life satisfaction and loneliness translate into an expected linear effect of relationship status on the dependent variables life satisfaction and emotional loneliness. For the post-hoc comparisons, point-biserial correlation coefficients are reported to interpret the effect size of the respective mean differences (LeBlanc & Cox, 2017). Point-biserial correlations can be transformed into other effect sizes measures such as Cohen's (1988) d (see Rosenthal (1994) for details).

Second, again using only the cross-sectional data collected at T1, mediation analyses were conducted via the PROCESS macro (Hayes, 2013). With these analyses, we determined whether the differences in life satisfaction and emotional loneliness between mingles and partnered adults would be mediated via fulfillment of the needs for autonomy, competence, and relatedness through the romantic partner. Hence, these analyses are based on the cross-sectional data of $N = 483$ participants ($M_{\text{age}} = 28.4$ years, $SD = 7.2$, range = 18-59; 69% female). Bootstrap confidence intervals (bCI) based on 10,000 bootstrap samples were assessed to determine whether the indirect effect was statistically significant. Fulfillment of all three needs was added simultaneous into the mediation model to account for overlap between the three needs in predicting life satisfaction and loneliness; hence, the applied model adjusts for the correlations among the three need fulfillment scales. We again controlled for participants' gender, age and duration of current relationship status.

Lastly, the Mplus Software (Muthén & Muthén, 2007) was deployed for the longitudinal analyses (T0 and T1 data; $N = 244$). Mplus is a widely used software for structural equation

modeling (SEM). SEM is a statistical modeling technique that allows for the modeling of the relationship between observed and latent variables and the modeling of the relationship between latent variables. In the current study SEM was used for analyzing the effect of a change in relationship status on life satisfaction and emotional loneliness. As we report standardized regression coefficient, the effect size can be interpreted the same way as the point-biserial correlation coefficients, .10 representing a small, .30 a medium and .50 a large effect size.

Results

Cross-Sectional Analysis

Results concerning the effect of relationship status on all dependent variables are presented in Table 3. Results regarding gender, age and duration of current relationship status are reported in the text only.

Relationship Status and Life Satisfaction. As can be seen in Table 3, there was a statistically significant difference in life satisfaction between the three groups. The polynomial contrast analysis indicated a linear effect ($c_{\text{linear}} = -.48, p < .001$; $c_{\text{quadratic}} = -.01, p = .939$). Regarding the post-hoc comparison single participants reported lower life satisfaction, $t(754) = 2.31, p = .020, r = .08$, than participants in a committed relationship but significantly higher levels of life satisfaction compared to singles, $t(754) = 2.51, p = .012, r = .09$. Compared to partnered participants single participants reported lower levels of life satisfaction, $t(754) = 7.11, p < .001, r = .25$.

Older participants reported lower levels of life satisfaction, $F(1, 754) = 6.83, p = .009, \eta^2 = .01$. There were no other effects involving gender or duration of current relationship status on life satisfaction, $F < 2.29, p > .131, \eta^2 < .003$, for all tests.

Relationship Status and Loneliness. With regard to social loneliness, no significant effect of relationship status could be found, $F(2, 754) = 1.59, p = .205, \eta^2 < .01$. No other effects concerning gender, age or duration of current relationship status reached significance, $F < 1.25, p > .263, \eta^2 < .003$, for all tests.

Concerning emotional loneliness, there was a large and significant effect of relationship status, $F(2, 754) = 177.23, p < .001, \eta^2 = .32$. The polynomial contrast analysis indicated a linear effect ($c_{\text{linear}} = 2.30, p < .001; c_{\text{quadratic}} = -.44, p = .026$). Post-hoc contrast showed that all pairwise differences were statistically significant: Both mingle, $t(754) = 8.39, p < .001, r = .29$, and single participants, $t(754) = 18.71, p < .001, r = .56$, indicated higher levels of emotional loneliness than partnered participants. The analysis also disclosed a significant difference on emotional loneliness between single and mingle adults with mingles reporting lower values on emotional loneliness, $t(754) = 4.32, p < .001, r = .16$.

There were no effects involving gender, age or duration of current relationship status on emotional loneliness, $F < 1$ for all.

Relationship Status and Need Fulfillment. Since the need satisfaction scales were used in this study concerning the current romantic partner, only mingle and partnered adults were administered this scale. Therefore, the sample of the following analyses was $N = 483$.

Results showed a significant effect of relationship status on all three need satisfaction scales: In the interaction with their intimate partner, partnered adults reported higher fulfillment of the needs for autonomy, competence, and relatedness compared to mingles. Main effects of gender on autonomy and competence could be found, indicating that – overall – men report lower fulfillment of the need for autonomy, $F(1, 475) = 9.00, p = .003, \eta^2 = .02$ and higher fulfillment of the need for competence than women $F(1, 475) = 4.21, p = .041, \eta^2 = .01$. Most interestingly, the analyses revealed significant interactions of relationship status and gender for autonomy, $F(1, 475) = 7.22, p = .007, \eta^2 = .02$, competence, $F(1, 475) = 10.04, p = .002, \eta^2 = .02$ and relatedness, $F(1, 475) = 12.91, p < .001, \eta^2 = .03$. Only for women, but not for men, need fulfillment was lower when they find themselves in a lower committed relationship status (Figure 1a to 1c).

No other effects involving gender, age or duration of current relationship status reached statistical significance, $F < 2.74, p > .098, \eta^2 < .01$.

Relationship Status and Commitment. There was a significant main effect of relationship status, $F(1, 475) = 181.76, p < .001, \eta^2 = .28$, indicating considerably higher values of commitment for participants in a stable romantic relationship in comparison to mingles. Again, there was a significant interaction between relationship status and gender, $F(1, 475) = 13.20, p < .001, \eta^2 = .03$. The difference in commitment between mingles and partnered individuals was larger for women (Figure 1d).³

Mediation Analyses. Next, we tested the hypothesis that the different dimensions of need fulfillment by the current partner mediate the differences in life satisfaction and loneliness between mingles and partnered adults. As only mingle and partnered adults had a “partner” during the assessment of the online questionnaire and singles did not, only the two groups were considered in the analysis (relationship status for these analyses was dummy coded as 0 = being in a committed relationship, 1 = mingle).

For the dependent variable life satisfaction, two of the three indirect effects (denoted *ab*) were statistically significant, while the direct effect of relationship status was not, $p = .849$. Findings suggest that differences in life satisfaction between mingles and adults in a committed relationship are fully mediated by fulfillment of the needs for competence ($ab = -.10, 95\% \text{ bCI} = [-.21, -.03]$), and relatedness ($ab = -.12, 95\% \text{ bCI} = [-.27, -.02]$), but not autonomy ($ab = -.04, 95\% \text{ bCI} = [-.15, .02]$). Group differences in emotional loneliness were partially mediated via fulfillment of the needs for autonomy ($ab = .15, 95\% \text{ bCI} = [.04, .33]$) and relatedness ($ab = .34, 95\% \text{ bCI} = [.12, .63]$), but not competence ($ab = .04, 95\% \text{ bCI} =$

³ We integrated age as an additional moderator into our existing models. By using hierarchical regression analyses, we tested whether adding the interaction terms between age and relationship status (dummy coded with mingle relationship as reference group) into the model leads to a significant change regarding the explained variance of the dependent variables. We compared the models with and without the interaction term between age and relationship status. Only with regard to relatedness need fulfillment through the current partner there was a significant change in $R^2, F_{diff}(1, 474) = 5.97, p = .015, R^2_{diff} = .01$. Concerning all other dependent measures, no significant increase could be found, $F_{diff} < 2.55, p > .079, R^2_{diff} < .01$. Including the interaction terms into the models did not alter the previous found main effects of relationship status. Furthermore, we also calculated the $dfbeta$ values for each regression model to control for possible influential cases due to age that might have affected our findings. However, no value exceeded the critical value of |2| (Stevens, 2009).

[-.05, .14]). The direct effect of relationship status on emotional loneliness remained statistically significant after including the three mediators, $p < .001$. To quantify the size of the mediation effect, we computed the proportion of the indirect effect to the total effect (Hayes, 2013)⁴. Results showed that 93% (life satisfaction) and 27% (emotional loneliness), respectively, of the differences between single and partnered adults were mediated through need fulfillment.

Since our previous findings revealed a gender by relationship status interaction on predicting need fulfillment, we repeated these mediation analyses separately for women and men. Results showed that the indirect effects were significant for women, but not men. Results of the mediation analyses on the dependent variables life satisfaction and emotional loneliness can be found in Figure 2, including the different coefficients for female and male participants.

Longitudinal analysis

The following analyses are based on the subsample for which longitudinal information on relationship status, life satisfaction, and loneliness was available ($N = 244$). When taking into account the respective relationship types at T0, 71% of singles remained single, 15% of singles did not change their relationship status and 83% of the partnered individuals remained partnered. 14% of the participants decreased in commitment regarding their relationship status whereas 16% shifted into a higher committed relationship status. With regard to individuals who decreased in commitment, 48% shifted from a steady relationship into singlehood, 22% from a stable partnership into a single relationship and 30% from single to single. Regarding increases in commitment, 41% changed their relationship status

⁴ Since the total effect amounts to the sum of the indirect effect and the direct effect, the proportion of indirect to total effect can be construed of as the proportion of the effect on the dependent variable that is mediated through the mediator.

from single to partnered, 46% from mingle to partnered and 13% from single to mingle. All transitions in relationship status are summarized in Table 4.

Based upon the analytic strategy by Kamp Dush and Amato (2005), we coded changes in relationship status with two dichotomous variables, reflecting upward and downward relationship changes, respectively. Changes from single to mingle, single to partnered and mingle to partnered were coded 1 in the upward relationship change variable (0 indicating the reference group). Transitions from partnered to mingle, partnered to single and mingle to single were also coded 1 in the downward relationship change variable with zero indicating the reference group. Hence, people who did not change their relationship status served as the reference group. In the structural equation models, we predicted life satisfaction (emotional loneliness) at T1 from life satisfaction (emotional loneliness) at T0 and the two dichotomous variables representing change in relationship status from T0 to T1. Further, change in relationship status was predicted from life satisfaction (emotional loneliness) at T0 to investigate potential effects according to the selection hypothesis. Figure 3 shows the structural equation model for the analysis of life satisfaction and Figure 4 displays the path model for the analysis of emotional loneliness. Although not displayed in Figures 3 and 4, the models also controlled for participants' gender and age, as well as the duration of the current relationship status at T0.

We found no evidence for effects of life satisfaction at T0 on upward relationship change, $\beta = -.03$, $p = .698$, or downward relationship change, $\beta = -.10$, $p = .288$. However, people who moved upwards in the continuum of commitment showed significantly higher levels of life satisfaction at the second measurement, $\beta = .30$, $p < .001$, controlling for life satisfaction one year earlier. Further analyses revealed that improvements of life satisfaction occurred for each form of upwards shifting ($\beta = .30$ for single to partnered, $\beta = .25$ for mingle to partnered, and $\beta = .31$ for single to mingle, respectively). Downward relationship change was associated with lower levels of life satisfaction at T1, $\beta = -.17$, $p = .038$. Additional

analyses revealed mostly all downward transitions to go along with decreased life satisfaction ($\beta = -.22$ for partnered to mingle, $\beta = -.22$ for partnered to single, and $\beta = .05$ for mingle to single, respectively).

With regard to emotional loneliness, we could find a significant effect of upward relationship change as well as downward relationship change on emotional loneliness at T1. Participants who shifted into higher committed forms of relationship status showed lower levels of emotional loneliness at T1, $\beta = -.42$, $p < .001$, whereas the opposite could be found for participants who reported downward relationship changes, $\beta = .52$, $p < .001$. Nearly all transitions in terms of upward relationship change were associated with decreased loneliness at T1 ($\beta = -.60$ for single to partnered, $\beta = -.15$ for mingle to partnered, and $\beta = .04$ for single to mingle, respectively). With regard to downward relationship change all transitions increased emotional loneliness at T1 ($\beta = .17$ for partnered to mingle, $\beta = .58$ for partnered to single, and $\beta = .44$ for mingle to single, respectively). Additionally, we found a significant association between emotional loneliness at T0 and upward relationship changes, indicating that individuals high on emotional loneliness tended to shift into more committed relationships, $\beta = .35$, $p = .001$, odds ratio = 1.42. There was no significant effect of emotional loneliness on downward relationship changes, $\beta = -.22$, $p = .060$.

Additional analyses

In our longitudinal analyses we tested if changes in relationship status predict rank order changes in life satisfaction and emotional loneliness. A complimentary research question would be to investigate if changes into more or less committed forms of partnership predict within-person changes in life satisfaction and loneliness. To approach this question, we used latent change score models as suggested by McArdle (2009). In these models, a latent change score is estimated which represents the (estimated) within-person change from one measurement occasions to the next. This latent change score model can then be predicted by other variables (here: change in relationship status) to examine predictors of inter-

individual differences in intra-individual change. The two models we tested are depicted in Figure 5 and Figure 6. For life satisfaction the identical pattern of results emerged compared to the longitudinal analysis used before. Upward relationship change influenced intra-individual changes in life satisfaction positively, $\beta = .41, p < .001$ while the reverse could be found for downward relationship change, $\beta = -.29, p < .001$. However, life satisfaction at T0 did not predict upward or downward relationship changes, $\beta = -.02, p = .785$ and $\beta = -.09, p = .336$, respectively. Hence, participants who shifted upward (downward) in their relationship status increased (decreased) in the life satisfaction from T0 to T1.

With regard to emotional loneliness, again, nearly the same findings could be found as with the cross-lagged analyses before. Upward relationship change predicted a significant negative change in emotional loneliness, $\beta = -.49, p < .001$, whereas downward relationship change resulted in a positive change in emotional loneliness, $\beta = .59, p < .001$. Moreover, also emotional loneliness at T0 predicted upward and downward relationship change, $\beta = .36, p < .001$ and $\beta = -.25, p = .020$.

Discussion

The current study was the first to incorporate mingles into a research program targeting the association of relationship status with life satisfaction and loneliness. Additionally, we investigated whether need fulfillment mediates these associations. Previous research on the relation of relationship status and well-being examined differences between single and partnered individuals concerning well-being and loneliness and did not investigate mingles (Adamczyk, 2015; Adamczyk & Segrin, 2015; Simon & Barrett, 2010). Following recommendations to investigate multiple aspects of well-being (Bierman, Fazio, & Milkie, 2006) we measured life satisfaction and loneliness to cover both positive and negative indicators of well-being. Additionally, by using a longitudinal design we could gain insight regarding the temporal dynamics of the effects.

Our results showed a large difference in commitment to the romantic partner between mingles and participants in committed relationships, corroborating our assumption that these two groups differ in the commitment dimension. With commitment assumed to be one of the core dimensions underlying the benefits of romantic relationships (Kamp Dush & Amato, 2005), we expected that also mingles' life satisfaction falls between life satisfaction of singles and partnered individuals. Confirming our research hypothesis 1, life satisfaction showed a linear relationship with relationship status, with lowest values for singles, followed by mingles and persons with committed relationships.

In a longitudinal analysis, Kamp Dush and Amato (2005) found evidence that entering into a more committed form of relationship resulted in an enhancement of subjective well-being which could explain the finding that mingles experienced greater life satisfaction compared to single individuals: Mingles find themselves in a more committed relationship than singles where they can share intimacy and sexual gratification leading to a slight elevation in their life satisfaction (Soons & Liefbroer, 2008). However, compared to partnered individuals, mingles lack a true commitment to the relationship. We expected that this would lead to differences in fulfillment of basic psychological needs through the partner between mingles and partnered individuals. In concordance with study hypothesis 3 our results showed that there were significant differences between these two groups regarding the fulfillment of the three basic needs for autonomy, competence, and relatedness: Participants in a stable relationship reported higher fulfillment of these needs through the current partner compared to mingle adults, with the largest difference for relatedness. Apparently, the more superficial and temporary forms of relationships that characterize the mingle status do not allow the fulfillment of the basic psychological needs (Dailey, 2009). Of important note, this main effect of relationship status was qualified by an interaction between relationship status and gender. For women, there was a strong effect of relationship status on all three components of need fulfillment whereas there was no effect on these three variables for men. This suggests

that women in comparison to men do not feel their needs truly met when they find themselves in a relationship with low commitment.

In a similar vein, and partly in line with our expectations (hypothesis 4), competence and relatedness (but not autonomy) need fulfillment fully mediated the association between relationship status and life satisfaction for women, but not for men. These results accompany prior research which showed that the fulfillment of each need through the partner was individually linked to greater life satisfaction (Patrick et al., 2007). In our study, autonomy need satisfaction did not mediate differences between single and partnered individuals regarding life satisfaction for either men or women. Similarly, León and Núñez (2012) report that only the needs for competence and relatedness but not for autonomy affected well-being (see also Neubauer & Voss, 2018, and Neubauer, Schilling, & Wahl, 2017, for other studies finding no incremental predictive validity of autonomy fulfillment). One explanation could be that the need for autonomy has an essential overlap with the need for competence and relatedness and can therefore not make an additional explanatory contribution. From a theoretical point of view, it is also possible that the feeling of autonomy is limited by a high commitment to the partner.

Regarding emotional loneliness, we also predicted a linear effect of relationship status, implying that singles would exhibit highest emotional loneliness, followed by singles and partnered individuals (hypothesis 2). Again we found support for a linear trend, indicating higher levels of commitment leading to lower emotional loneliness. The lack of emotional involvement in a single relationship may be an explanation for these results (Rokach & Brock, 1998). As with the effects on life satisfaction, this effect was not moderated by gender, indicating that both men's and women's loneliness was affected to a similar degree by their relationship status. Although singles are more committed compared to single adults (who cannot be committed to a romantic partner by definition), the emotional distance in this

rather loose form of partnership (compared to adults in a truly committed partnership) could explain a higher perception of emotional loneliness.

For emotional loneliness, we expected that specifically the fulfillment of relatedness need would mediate differences in emotional loneliness between mingles and partnered adults. Results partially confirmed this hypothesis 5 as not only relatedness need fulfillment showed a statistically meaningful indirect effect but also autonomy need fulfillment. Again, this effect was observed only for women, but not for men. The role of relatedness satisfaction in explaining part of the difference in loneliness was to be expected given the relatedness need's referring to the meaning of close and caring connections to other individuals. Mingles do not fully and truly commit to their current partner and therefore do not experience a close and caring romantic relationship which in turn leads to a higher emotional loneliness. The lower autonomy need fulfillment could indicate the inability to truly confirm to this rather loose relationship to turn it into a close and committed one. Possibly, mingles desire to have a more stable partnership but fail because the partner fears missing out better opportunities by committing to the relationship. This is rather speculative and should be investigated more deeply in the future by investigating whether these individuals are mingles by choice (and, hence, autonomously motivated for this kind of relationship) or not. Freedom of choice could act as a possible moderator concerning the association between relationship status and outcomes. People who freely decided to have this kind of relationship might experience lower emotional loneliness and higher life satisfaction compared to those who could not choose.

Longitudinal Analyses

Although our data show differences between all three groups regarding life satisfaction and loneliness, the causality or direction of these effects remains unclear. Following a selection perspective, it could also be possible that well-adjusted individuals are more likely to enter into more committed forms of relationships (Kamp Dush & Amato, 2005). Better adjusted persons are perceived to form and remain in stable relationships (Horn,

Xu, Beam, Turkheimer, & Emery, 2013). Using a longitudinal design, our results replicated the findings of Kamp Dush and Amato (2005), showing that increases in commitment lead to higher life satisfaction. Furthermore, downward relationship change reduced life satisfaction. Concerning emotional loneliness, shifting into more committed types of relationships was associated with reduced loneliness, whereas decreases in commitment were linked to higher levels of emotional loneliness, indicating more committed individuals feeling less lonely. However, individuals scoring high on emotional loneliness also tended to counteract these feelings by shifting into more committed partnerships. These findings are largely consistent with the assumption that basic psychological needs act as motives driving human behavior (Sheldon, 2011). According to this account the frustration of a basic psychological need is hypothesized to increase motivation to re-establish the thwarted need. For example, Sheldon and Gunz (2009) showed that participants who stated more frustration of the need for relatedness reported more motivation to pursue their dissatisfied need for relatedness. Our results support this view as they showed that participants who felt lonelier were more likely to find themselves in a higher committed form of relationship one year later. Moreover, when conducting the analyses predicting intra-individual change, nearly the identical pattern of results could be observed, indicating changing into higher committed forms of partnership leading to an increase in life satisfaction and decrease in emotional loneliness, yielding no evidence for an alternative selection hypothesis.

Gender Effects

In all analyses involving need fulfillment, we found evidence for moderation effects by gender. These results were not predicted, and should therefore be considered exploratory. Regarding all three components of need satisfaction, the effect of relationship status was statistically significant for women, but not for men. Sexual strategy theories suggest that women focus more on steady and long-term relationships compared to man (Buss & Schmitt, 1993). The importance of having a strongly committed partnership seems to be more

pronounced for women (Olmstead, Anders, & Conrad, 2016). Our results contribute to these findings by showing that men feel their basic psychological needs satisfied regardless if they find themselves in a mingle or steady relationship.

Gender did not, however, moderate the effect of relationship status on either life satisfaction or emotional loneliness. That is, men's and women's life satisfaction and emotional loneliness were equally affected by their relationship status, but the mechanism mediating this association seems to be different: The link between relationship status and life satisfaction as well as emotional loneliness was mediated through need fulfillment for women, but not for men. For women, being in a mingle partnership might not fulfill their basic psychological needs to a full degree and this leads to increased emotional loneliness and impaired life satisfaction. Although men also feel less satisfied and emotionally lonelier when being mingle, this relationship cannot be explained through need fulfillment. Future research might consider examining potential other mechanisms (e.g., perceived risk of partner's sexual infidelity; see Cramer, Abraham, Johnson, & Manning-Ryan, 2001) that can help explain, why male mingles report lower well-being than males in committed relationships.

Limitations and Future Directions

Some limitations need to be considered regarding the results of the current study. First of all, the analyses are based on self-reports and can therefore be influenced by biases in the responses.

Second, as the concept mingle is not well defined yet, it is possible that some participants who are steadily dating or find themselves in an open relationship tended to choose the mingle option. The same may count for single individuals who might be single for different reasons like being divorced, widowed or because they did not find the right partner, yet. Singles are a diverse group (Cotten, 1999) and it is not clear if the findings are the same for the particular subgroups. Moreover, we did not assess in our longitudinal analysis whether the partner after the transition from the mingle relationship into the stable partnership was the

same as the mingle partner before. This should be controlled in future investigations to determine whether mingle relationships are early stages of partnerships or whether the later stable partnership was started with a new partner, and whether these two types of transitions are accompanied by similar changes in well-being.

Third, findings show that higher committed forms of relationship are beneficial for people's well-being on average. Nevertheless, individuals might differ in the degree to which their well-being is affected by transitioning into relationship forms characterized by higher commitment. Some people might be satisfied with being single and not having any responsibilities towards a partner. Furthermore, a stable partnership is no guarantee for happiness when it is characterized by emotional or physical abuse. Further investigating relationship quality as an influential factor regarding the relationship of marital status and well-being would have been necessary to detect such differences within the specific relationship types. Holt-Lunstad, Birmingham and Jones (2008) could find that entering in a marriage is associated with higher life satisfaction but that the quality of the respective relationship also matters. Singles show advantages in comparison to those married individuals reporting low relationship quality, emphasizing the fact that higher committed forms of partnership are no guarantee for being happy. To conclude, the group differences found in our study reveal stable partnerships to be more satisfying compared to mingle or single relationships on average, which may not be true for each individual.

Fourth, although more age heterogeneous than previous studies, the sample of the present research was not intended to be a lifespan sample. There is a rich literature on the importance of social relationships from a lifespan developmental perspective (e.g., Kahn & Antonucci, 1980; Carstensen, Isaacowitz, & Charles, 1999) which suggests that the effects obtained in the present study might not be invariant across the whole human lifespan. Hence, an interesting avenue for future research would be to examine potential age differences in the processes revealed in the present work with an age stratified sample.

Finally, further research is necessary to illuminate processes which account for the differences between mingle and partnered adults concerning emotional loneliness and life satisfaction. There is some current research addressing a relatively new phenomenon which is called “fear of missing out” that emphasizes the desire to be continually up to date with what others are doing and to avoid missing rewarding experiences (Przybylski et al., 2013). This fear of missing out is negatively related to life satisfaction and general mood (Przybylski et al., 2013). Possibly, similar motives drive persons to stay in a mingle status, as they fear leaving out better opportunities. This “fear of missing out”- concept should therefore be integrated in the analyses of well-being with regard to mingles.

Conclusion

The findings of our study show that mingles as well as singles were less satisfied with their lives and experienced greater emotional loneliness than individuals in a committed relationship. In our longitudinal analysis, we could foster these findings by indicating that increases in commitment within a one-year interval were associated with higher life satisfaction and a lower emotional loneliness whereas decreased commitment was linked to greater emotional loneliness and reduced life satisfaction. Moreover, only female but not male mingles differed from partnered adults in fulfillment of the basic psychological needs for autonomy, competence, and relatedness. For women, competence and relatedness need fulfillment fully mediated the link between partner status and life satisfaction concerning mingles and partnered individuals whereas the connection to emotional loneliness was especially mediated by relatedness and autonomy need fulfillment. Need fulfillment did not operate as a mediator for male participants. For men, other processes must be targeted by future research.

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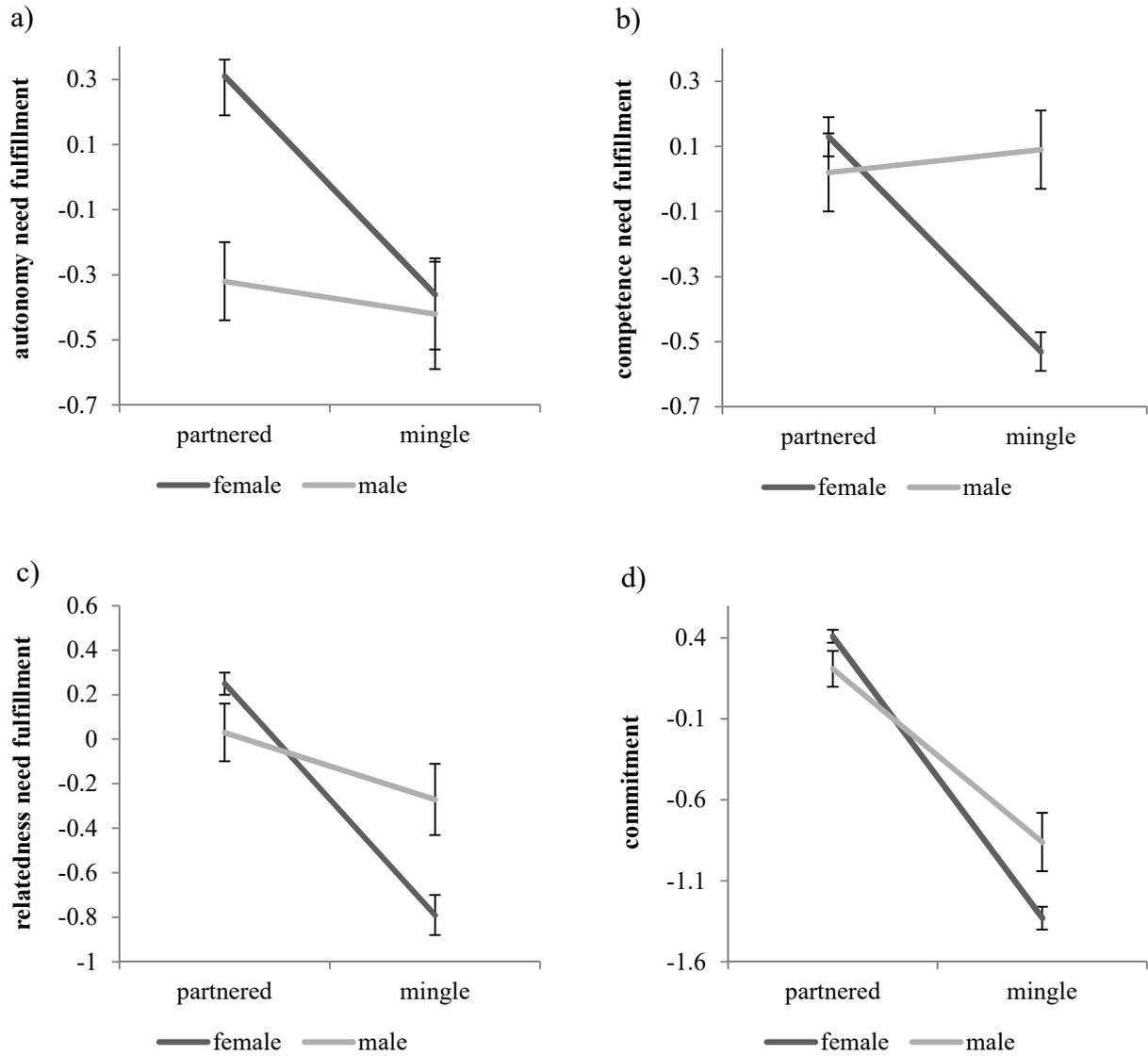


Figure 1. Interaction between relationship status and gender regarding all three components of need fulfillment and commitment. Error bars indicate standard errors; y-axis shows z-standardized scores.

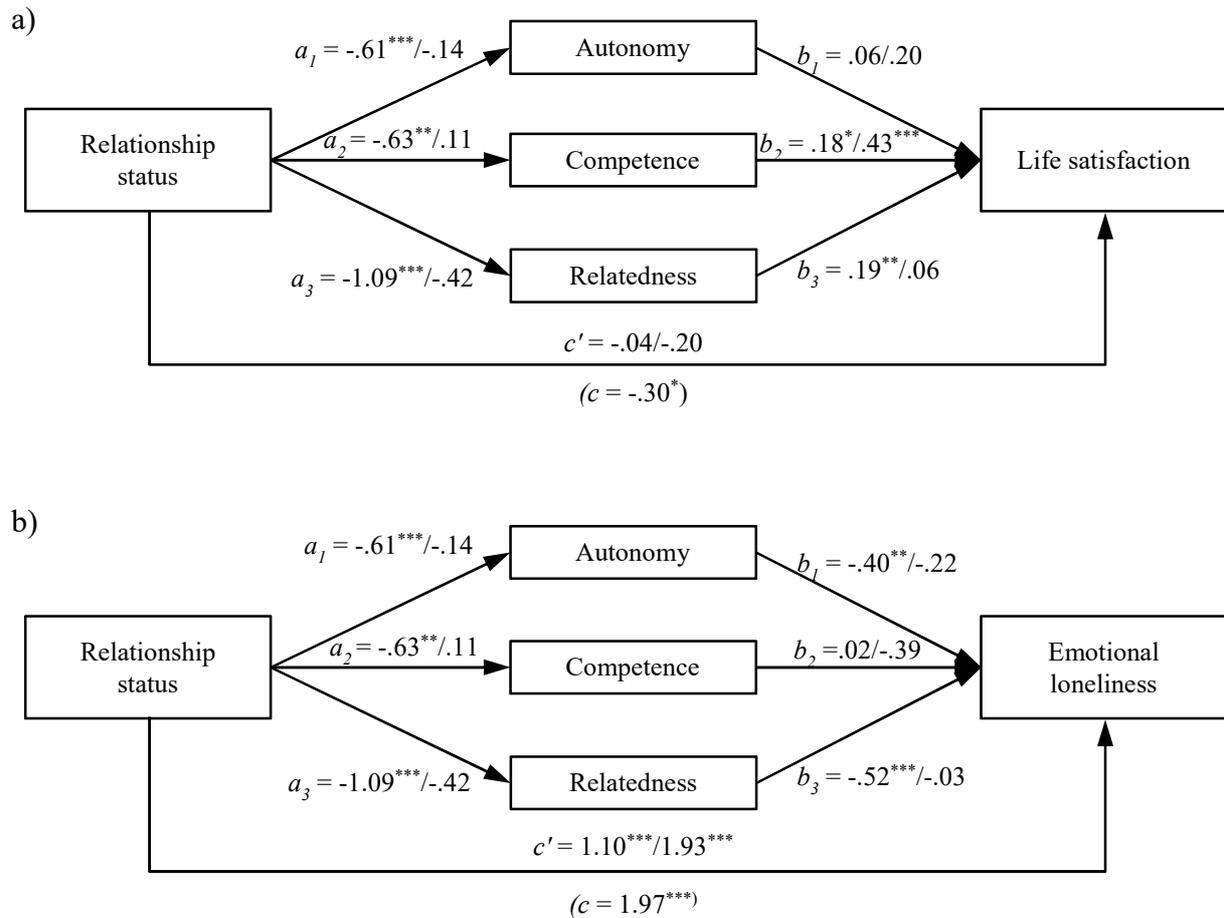


Figure 2. Indirect effect of relationship status on life satisfaction (Fig. 2a) and emotional loneliness (Fig. 2b) through all three dimensions of need fulfillment. Regression parameters are unstandardized. Parameters on the left display the effects for female participants and on the right those for male individuals. c = total effect; c' = direct effect. $^{***} p < .001$, $^{**} p < .01$, $^* p < .05$, $N = 483$.

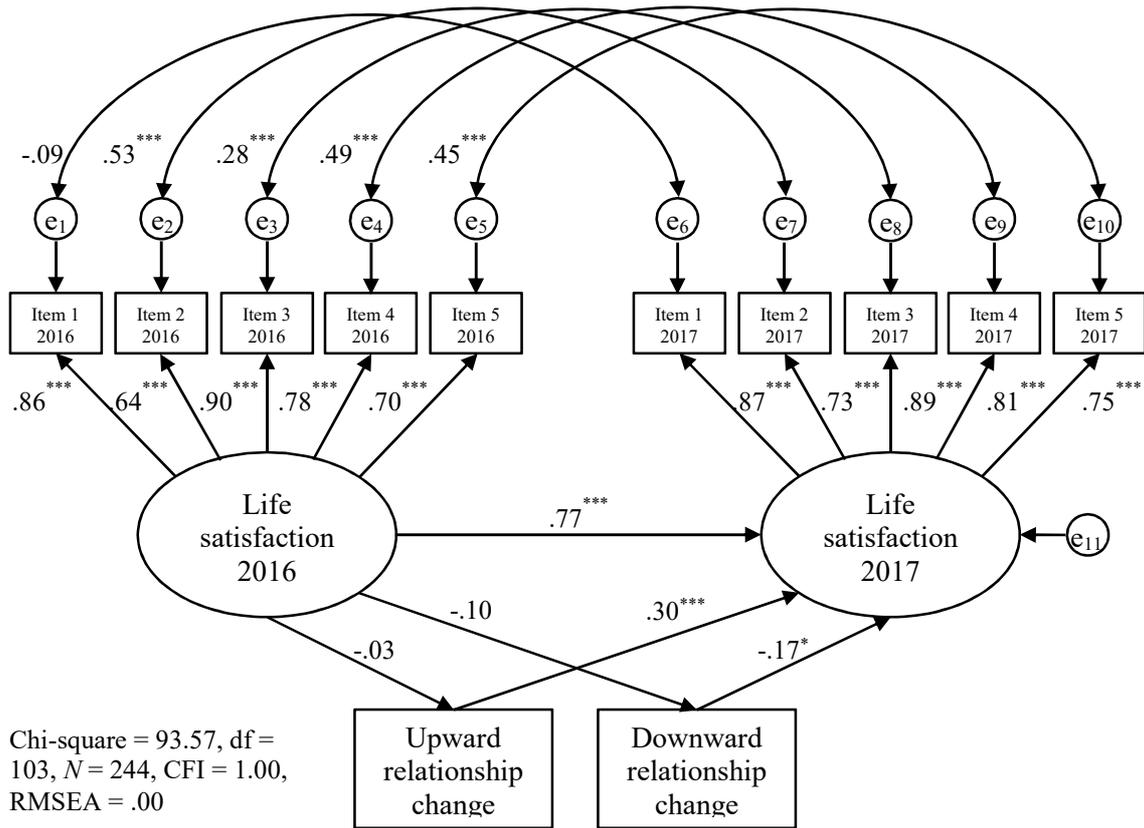


Figure 3. Structural equation model showing the associations between life satisfaction and increases or decreases in relationship status. Age, gender, and duration of relationship status in 2016 are included as covariates. All coefficients are standardized. *** $p < .001$, * $p < .05$.

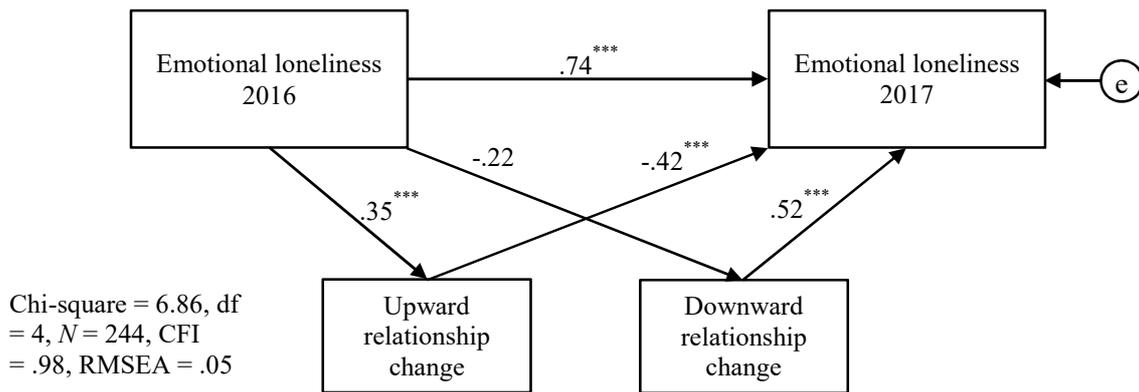


Figure 4. Path model showing the associations between emotional loneliness and increases or decreases in relationship status. Age, gender, and duration of relationship status in 2016 are included as covariates. All coefficients are standardized. *** $p < .001$, * $p < .05$.

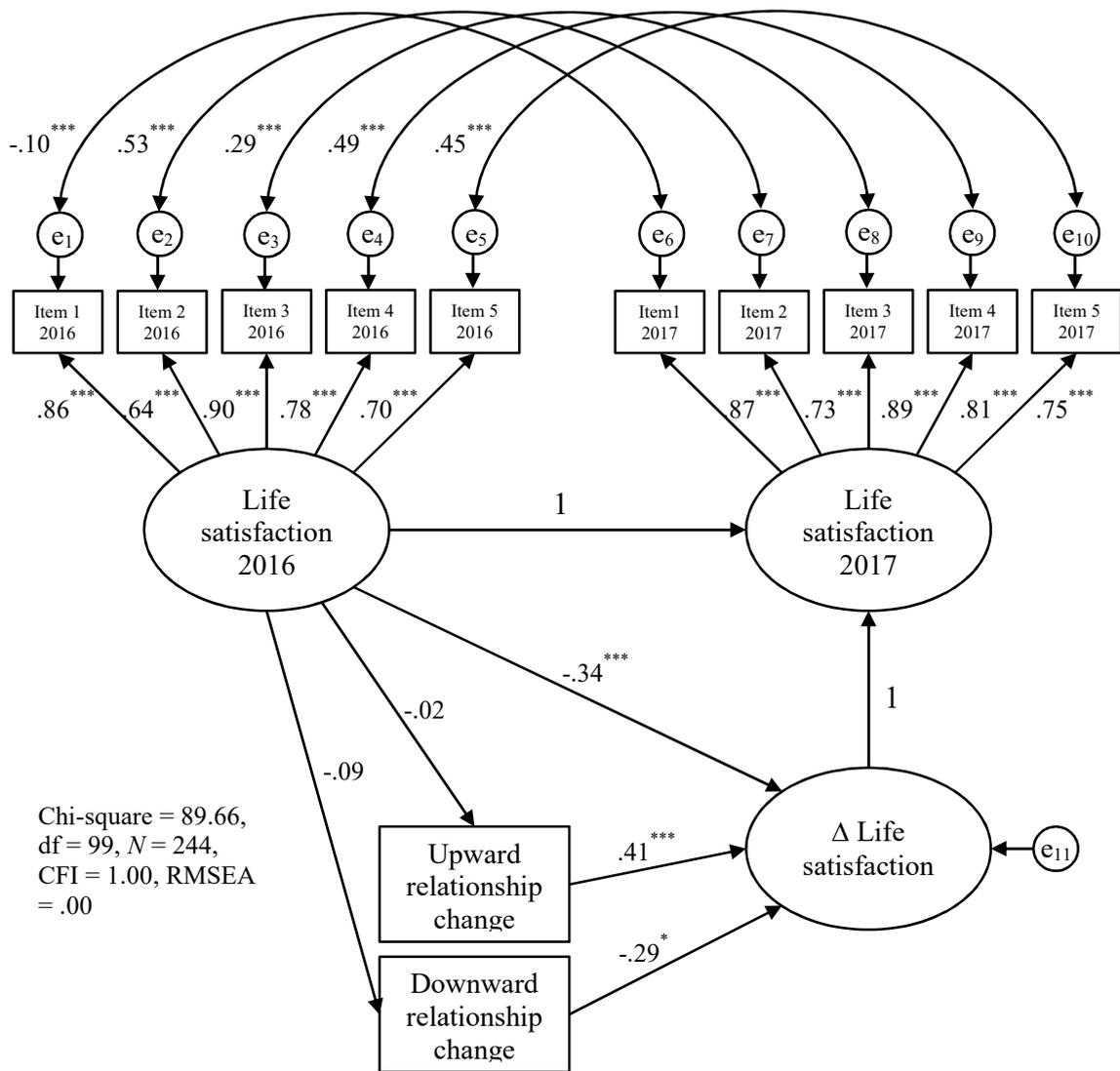


Figure 5. Latent change model showing the associations between intra-individual change in life satisfaction and increases or decreases in relationship status. Age, gender, and duration of relationship status in 2016 are included as covariates. All coefficients are standardized. *** $p < .001$, * $p < .05$.

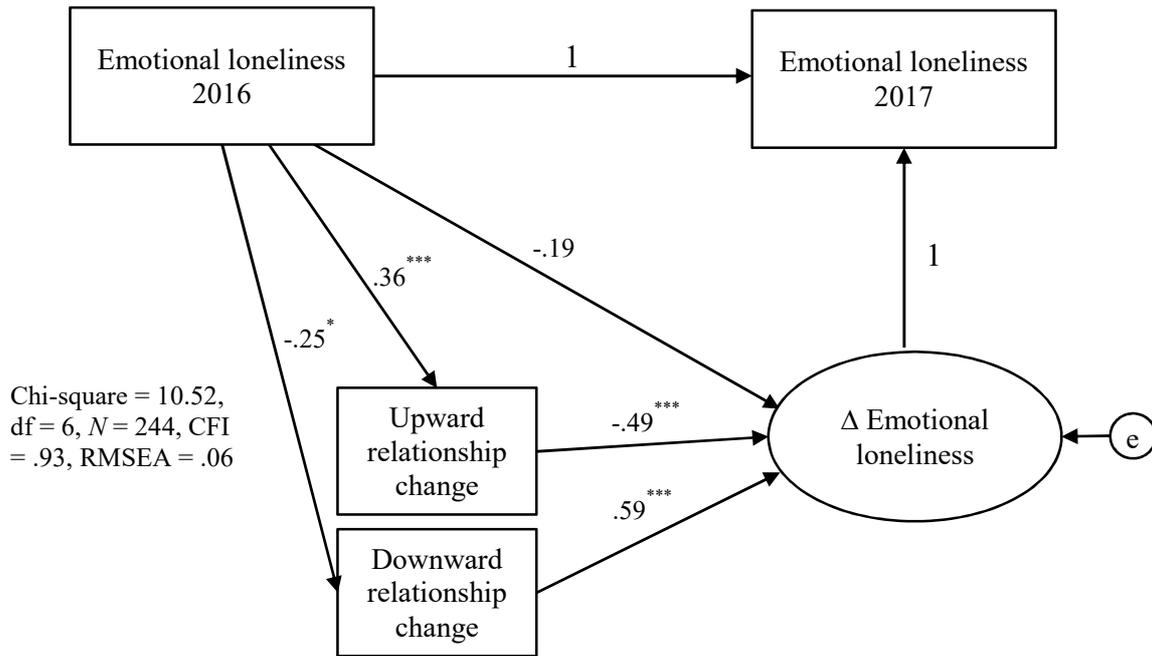


Figure 6. Latent change model showing the associations between intra-individual change in emotional loneliness and increases or decreases in relationship status. Age, gender, and duration of relationship status in 2016 are included as covariates. All coefficients are standardized. *** $p < .001$, * $p < .05$.

Table 1
Descriptive Statistics and Intercorrelations

Measure	Mean	SD	1	2	3	4	5	6	7	8	9
1 Age	28.26	7.21	1								
2 Gender ^a	.38	.49	.12**	1							
3 Autonomy ^b	6.07	.99	-.08	-.23**	1						
4 Competence ^b	5.72	.97	.05	.03	.62**	1					
5 Relatedness ^b	5.95	1.14	-.09	-.03	.63**	.60**	1				
6 Commitment ^b	5.72	1.61	.03	-.04	.47**	.41**	.63**	1			
7 Social Loneliness	3.55	2.18	-.04	-.01	-.13**	-.22**	-.11*	-.08	1		
8 Emotional Loneliness	3.68	2.56	.01	.13**	-.36**	-.31**	-.43**	-.48**	.28**	1	
9 Life Satisfaction	4.96	1.19	-.09*	-.05	.31**	.35**	.34**	.28**	-.38**	-.38**	1

Note. $N = 764$

* $p < .05$

** $p < .01$

^a 0 = female, 1 = male

^b $N = 483$

Table 2
Demographic Questionnaire

Variable	Total sample (N=764) N (%)	Single sample (N=281) N (%)	Mingle sample (N=111) N (%)	Partnered sample (N=372) N (%)
Age ^a	28.26 (7.21)	28.06 (7.27)	29.14 (6.72)	28.14 (7.31)
Gender				
Female	472 (61.8)	141 (50.2)	74 (66.7)	257 (69.1)
Male	292 (38.2)	140 (49.8)	37 (33.3)	115 (30.9)
Duration of current relationship status				
Less than 6 months	173 (22.6)	67 (23.8)	64 (57.7)	42 (11.3)
Between 6 and 12 months	89 (11.7)	46 (16.4)	15 (13.5)	28 (7.5)
Between 12 and 24 months	124 (16.2)	37 (13.2)	13 (11.7)	74 (19.9)
More than 24 months	378 (49.5)	131 (46.6)	19 (17.1)	228 (61.3)

Note. ^a Mean (SD)

Table 3

Means and standard deviations on all outcome variables by relationship status

Variable	Single sample (N=281) <i>Mean (SD)</i>	Mingle sample (N=111) <i>Mean (SD)</i>	Partnered sample (N=372) <i>Mean (SD)</i>	<i>F value</i>	<i>df</i>	η^2
Well-being						
Life satisfaction	4.59 (1.14)	4.86 (1.20)	5.27 (1.14)	25.39***	2/754	.06
Loneliness						
Social loneliness	3.68 (2.27)	3.42 (2.21)	3.48 (2.10)	1.59	2/754	.00
Emotional loneliness	5.42 (2.35)	4.32 (2.44)	2.18 (1.71)	177.23***	2/754	.32
Need fulfillment ^a						
Autonomy		5.70 (1.02)	6.17 (.95)	9.00***	1/475	.02
Competence		5.41 (.97)	5.81 (.95)	5.22**	1/475	.01
Relatedness		5.25 (1.24)	6.16 (1.01)	29.67***	1/475	.06
Commitment ^a		3.83 (1.65)	6.29 (1.09)	181.76***	1/475	.28

Note. ^a N = 483*** $p < .001$ ** $p < .01$

Table 4
Transitions in relationship status

Relationship Status T1	Relationship Status T0					
	Single		Mingle		Partnered	
	N	%	N	%	N	%
Single	52	71	10	30	16	12
Mingle	5	7	5	15	7	5
Partnered	16	22	18	55	117	83