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Social connectedness as a source and consequence of meaning in life

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Multiple studies have shown that the sense of belonging and connectedness contribute to meaning in life, but does meaning also influence social connectedness? The present research examines the reciprocal relationships between meaning and different types of connectedness: intimate, relational, and collective. Analyzing data from a nationally representative longitudinal study (Study 1) with cross-lagged panel models, we found that only collective connectedness was prospectively associated with meaning, whereas meaning was prospectively associated with all three types of connectedness, controlling for life satisfaction. The beneficial effect of meaning extended to behavioral indicators of collective and intimate connectedness (Study 2). Higher levels of meaning in life were prospectively associated with an increased likelihood of joining voluntary associations and getting married, and, for people high in marital satisfaction, with a decreased likelihood of marital separation. Together, these findings suggest that the relationship between social connectedness and meaning in life is bidirectional.

Keywords: meaning in life; personal relationships; intimate; relational and collective connectedness; sense of belongingness; purpose in life; voluntary associations; marriage; separation

The reciprocal relations between meaning in life and social connectedness: a longitudinal analysis

While life satisfaction and affect have been given much attention within and outside of the field of positive psychology, research on meaning in life remains comparatively scarce. Most studies in this context have examined antecedents of meaning in life and have emphasized the role of social relationships as one of the central ingredients of a sense of meaning in life (e.g. Lambert et al., 2013). Social support and closeness with others are positively related to the sense of meaning in life, whereas social exclusion and ostracism have been shown to render the perception of one's life as meaningless (Lambert et al., 2013; Twenge, Catanese, & Baumeister, 2003; Williams, Cheung, & Choi, 2000).

While we have a rather good understanding of what contributes to meaning in life, the consequences of having a high (or low) sense of meaning in life are far less well explored. In the present research, we examined the hypothesis that meaning in life might be not only a consequence, but also a source of positive social relationships. Recent research has shown that individuals who find life meaningful are more likely to state social relationships among their important goals (Martos & Kopp, 2012) and are rated as more socially attractive than individuals who perceive less meaning in life (Stillman, Lambert, Fincham, & Baumeister, 2011). These findings suggest that meaning in life might in fact impact social

connectedness, such that social connectedness and meaning in life influence and strengthen each other in a positive cycle. However, empirical evidence for this hypothesis is absent, mainly due to the scarcity of longitudinal studies that measured both meaning in life and social connectedness at several points in time. Such longitudinal data are necessary to examine the reciprocal prospective effects of meaning in life on social connectedness and vice versa. However, to date, only few longitudinal studies measuring both variables simultaneously exist (Krause, 2007; Lambert et al., 2013) and none of them have examined the potential reciprocal relationship between meaning in life and social connectedness. In addition, while the presence/absence of the sense of belonging was identified as an important predictor of meaning in life, there is less clarity regarding what kind of relationships – with one's family members and a romantic partner or with a larger community – contribute to a meaningful life.

The present research fills these gaps. In Study 1, we examined the reciprocal relationships between meaning in life and social connectedness using longitudinal data from a representative sample of the American population. Drawing on the literature on different forms of connectedness (Hawkley, Browne, & Cacioppo, 2005), we distinguished between three different types of relationships: with a partner/spouse, family/friends, and a larger community. Whereas Study 1 relied on self-report

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measures exclusively, Study 2 replicated and expanded the findings on the prospective effect of meaning in life on social connectedness, by using behavioral indicators of social connectedness such as joining volunteer associations, getting married, or separating from one's spouse. This study was based on a representative sample of the British population.

Social connectedness as a source of meaning in life

Multiple studies have shown that the sense of belonging, anticipated social support, and received emotional support are all positively associated with meaning in life (Hicks & King, 2009; Hicks, Schlegel, & King, 2010; Krause, 2007; Lambert et al., 2013), whereas social exclusion reliably leads to meaning loss. Several experiments showed that participants assigned to a social exclusion condition (e.g. being excluded in a ball toss game or being ostensibly forgotten by other participants) rated their lives as less meaningful than their counterparts in the control condition (King & Geise, 2011; Stillman et al., 2009; Twenge et al., 2003; van Beest & Williams, 2006; Williams et al., 2000).

While these studies have established positive social relationships as an important source of meaning in life, much less is known about what kind of social relationships matters most. In other words, with whom – family, friends, or even a larger community – does one have to connect to reach a stronger sense of meaning in life?

These different types of connections can be classified as intimate, relational, and collective connectedness (Cacioppo & Cacioppo, 2012; Hawkey et al., 2005). Intimate connectedness is best predicted by the presence of a spouse or an intimate romantic partner. Relational connectedness describes the presence of more remote connections with others, such as friends and family members. Finally, collective connectedness is characterized by the sense of belonging to a larger community or a social group and is reflected in the number of memberships in larger voluntary associations (Hawkey et al., 2005). What level of connectedness – intimate, relational, or collective – represents the most powerful and enduring source of meaning? While a couple of studies compared the importance of one's family vs. friends (and found closeness to family to have more weight in meaning in life judgments than closeness to friends; Lambert et al., 2010; Pinguart, 2002), no prior studies have undertaken a comprehensive analysis of all three types of connectedness and meaning in life.

Despite the lack of empirical evidence, several theoretical accounts let us expect that collective connectedness plays a more important role for meaning in life than the other two forms of connectedness. Baumeister and Vohs (2002) has suggested that satisfying the four basic needs – need for purpose, need for values, need for a

sense of efficacy, and need for self-worth – is essential for finding life meaningful. A sense of collective connectedness might satisfy at least two of these needs better than the other types of connectedness. Specifically, being accepted by a larger social group might be a more potent source of both self-worth and efficacy than being accepted by one's partner, parents, or friends. The role of collective connectedness can be further considered from the perspective of terror management theory. One of the pillars of terror management theory is that endorsement of one's cultural world views and identification with one's cultural ingroup represents a defense mechanism that helps people deal with existential anxiety (e.g. Greenberg & Kosloff, 2008). Hence, group memberships can be used to 'transcend' the limits of the self and help in a fight against meaninglessness of one's existence. Finally, relationships with a larger community and group memberships are distinguished through a voluntary character, such that individuals can withdraw from them anytime. Voluntary self-selected connections are more likely to fulfill the function of self-expression; and self-expression as well as identity building were shown to be important predictors of meaning in life (Baumeister, Vohs, Aaker, & Garbinsky, 2013).

Meaning in life as a source of social connectedness

Whereas most studies considered social relationships as a source of meaning in life, it has been recently suggested that meaning in life can affect social relationships as well (Stillman et al., 2009). Although this possibility has not yet been examined empirically, there are several pathways through which an enhanced sense of meaning in life might result in social connectedness. Meaning in life might influence individuals' goal setting, making social relationships gain in importance relative to other goals (Martos & Kopp, 2012). Also, a stronger approach motivation typical of individuals with a strong sense of meaning (Steger, Kashdan, Sullivan, & Lorentz, 2008) might facilitate acting on these goals and engaging in behaviors aimed at increasing social connectedness, such as approaching new people, maintaining existing connections, starting a romantic relationship, or joining larger groups or associations.

In addition, individuals who find life meaningful can enjoy stronger social connectedness as a result of other peoples' behavior. In several experiments, Stillman et al. (2011) demonstrated that people who find life meaningful are rated as more likeable and as more desirable interaction partners. For these reasons, they might have an easier time building positive relationships. In summary, meaning in life might enhance social connectedness through various mechanisms. The present research is the first attempt to examine this hypothesis using longitudinal, prospective data.

The present research

In Study 1, we investigated whether high values on three types of social connectedness (intimate, relational, collective) are prospectively related to an increased sense of meaning in life and whether perceiving one's life as meaningful at baseline increases the sense of connectedness 10 years later. We expected social connectedness and, in particular, collective connectedness to prospectively predict meaning in life (Hypothesis 1), and meaning in life to prospectively predict social connectedness (Hypothesis 2).

In Study 2, we examined whether a sense of meaning in life can enhance the likelihood of particular behaviors related to social connectedness: (1) joining voluntary organizations in the following two years (a behavioral indicator of collective connectedness), and (2) getting married or separated (behavioral indicators of intimate connectedness). We expected that meaning in life would be positively associated with an increased likelihood of joining a voluntary organization (Hypothesis 3), an increased likelihood of marriage (Hypothesis 4), and a decreased likelihood of marital separation (Hypothesis 5).

Finally, we controlled for life satisfaction in both studies. Meaning in life is positively correlated with but conceptually distinct from life satisfaction (Steger & Kashdan, 2007). Life satisfaction is a potential confound of the relationship between social connectedness and meaning in life because it tends to be positively and prospectively associated with both self-report measures of social connectedness (Lucas & Dyrenforth, 2006) and with behavioral indicators of connectedness, such as a higher number of group memberships and a higher likelihood of getting married (Luhmann, Lucas, Eid, & Diener, 2013; Thoits & Hewitt, 2001). Therefore, we additionally examined whether the hypothesized associations between social connectedness and meaning in life are independent of individual differences in life satisfaction by controlling for this potential confound.

Study 1

Method

Data and participants

The data used in this study came from the longitudinal Midlife in the United States study (MIDUS) (Ryff et al., 2012). The MIDUS participants are representative of the American population. The data were collected in two waves separated by a 10-year period: in 1995/1996 and in 2005/2006. At the initial measurement occasion, 7108 individuals (47.8% men, $M_{\text{age}} = 46.38$, $SD = 13.00$; 87% Caucasians, 5% African-Americans, 5.8% other ethnicity) participated in the study. At the second measurement occasion, 4963 individuals (46.4% men, $M_{\text{age}} = 55.43$, $SD = 12.44$; 89.3% Caucasians, 3.8% African-Americans,

5.3% other ethnicity) remained in the sample. Of these, 1.8% had no valid data on either of the variables of interest and were not considered in the analysis. 24.6% of those respondents who participated at both measurement occasions had missing values on at least one of the variables of interest. Full maximum-likelihood estimation method was used to deal with missing values. With this method, the model is estimated based on the observed variance-covariance matrix based on all available data points (Schafer, 1997).

Measures

Meaning in life was measured with the item 'Some people wander aimlessly through life, I am not one of them' that was rated on a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Results of a pretest study revealed that this single-item measure shows strong correlations with established multiple-item scales of meaning in life (Ryff's Purpose in Life scale: $r = .74$; Steger's MLQ-Presence of Meaning: $r = .77$) and good external validity (see Supplemental Online Materials and Table S1 for details).

A measure of participants' sense of integration into their community was used as an indicator of collective connectedness. We used three items originating from the social integration scale (Keyes, 1998) (sample item: 'I feel close to other people in my community'). Responses were given on a scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*) and were averaged to produce a score of collective connectedness (Cronbach's $\alpha = .74$ at Time 1 and $\alpha = .75$ at Time 2). This scale has been shown to correlate convergently with community involvement and the perceived health of one's neighborhood, supporting its construct validity (Keyes, 1998).

As social support associated with family and friends represents an important ingredient of relational connectedness (Hawkey et al., 2005), we used participants' perceived support from their families and friends as indicators of relational connectedness. Connectedness with family was measured with four items (sample item: 'Not including your spouse or partner, how much do members of your family understand the way you feel about things?'), Cronbach's $\alpha = .84$ at both occasions). Connectedness with friends was measured with the same items with the words 'members of your family' replaced with 'your friends' (Cronbach's $\alpha = .88$ at both occasions). As family and friends connectedness were moderately correlated (Time 1: $r = .39$, $p < .001$; Time 2: $r = .38$, $p < .001$), we treated them as separate variables.

Intimate connectedness was operationalized as connectedness with one's spouse and measured with six items (sample item: 'How much does your spouse or partner really care about you?'), Cronbach's $\alpha = .91$ at Time 1 and $\alpha = .90$ at Time 2). Only participants who

had a spouse or a partner completed the intimate connectedness questions ($N_{\text{time } 1} = 4793, N_{\text{time } 2} = 3079$). For family, friends, and spouse connectedness, the response scales ranged from 1 (*a lot*) to 4 (*not at all*) and were recoded such that higher values indicate a stronger degree of connectedness. These scales have been shown to correlate positively with social contacts frequency and negatively with the perceived relationship strain, supporting its construct validity (Seeman et al., 2011; Walen & Lachman, 2000).

To measure life satisfaction, MIDUS included the Cantril Self-Anchoring Scale (Cantril, 1965). Participants were asked to ‘rate their life overall these days, using a scale from 0 to 10 where 0 means “the worst possible life overall” and 10 means “the best possible life overall.”’ Single-item measures such as this one are used frequently in large-scale panel studies and have been shown to be reliable and valid indicators of life satisfaction (Diener, Inglehart, & Tay, 2013; Lucas & Donnellan, 2012).

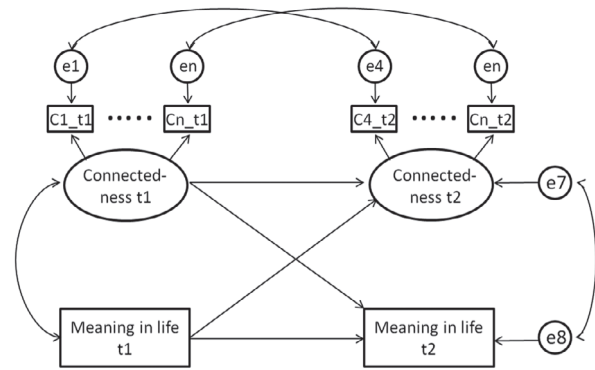
Analytical strategy

The data were analyzed using cross-lagged path analysis available in the R package lavaan (Rosseel, 2012). To assess the independent effects of four types of connectedness on meaning in life, we analyzed them simultaneously in the same models. We first fitted a cross-lagged model that specified both cross-lagged and stability (autoregressive) effects of meaning on different types of connectedness and vice versa. In the second step, we added the effects of life satisfaction at Time 1 on meaning in life and connectedness at Time 2 (Figure 1). We used robust (White–Huber) standard errors.

The comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root-mean-square error of approximation (RMSEA) were used to evaluate the overall model fit (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003). For model comparisons, we used the change in these fit indices in addition to the χ^2 -difference test because the χ^2 -difference test depends heavily on sample size (Cheung & Rensvold, 2002).

All connectedness variables were modeled as latent variables. Therefore, before fitting the structural models, we tested the measurement invariance of each latent variable across time. We examined configural and metric (also known as loading or weak factorial) invariance (Little, Preacher, Selig, & Card, 2007). Unconstrained models with free loadings fit the data well (Table S2 for fit indices), suggesting that configural invariance was reached. To evaluate metric invariance, we placed constraints on the factor loadings (i.e. we set the factor loadings of the same items to be equal over time). The constrained models differed only marginally from the models with free factor loadings. Although the

Model 1:



Model 2:

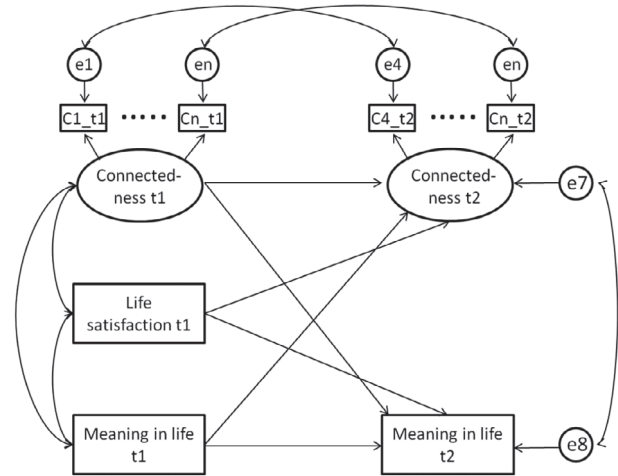


Figure 1. Cross-lagged panel model, Study 1.

χ^2 -difference tests were significant in three out of four cases (see Table S2 for details), the differences in the fit indices were smaller than the recommended cut-off values for all latent variables, with $\Delta\text{CFI} < .01$, $\Delta\text{TLI} < .01$, and $\Delta\text{RMSEA} < .01$ (Cheung & Rensvold, 2002). Thus, metric invariance can be assumed for all measurement models.

Results

Cross-lagged and stability effects are shown in Table 1 (for means, standard deviations, and correlations among the latent variables see Table S3). Model 1 included the effects of all four types of connectedness at Time 1 on meaning in life at Time 2 while controlling for their stability effects. The model showed appropriate fit, $\chi^2(550) = 6239.73$, CFI = .94, TLF = .93, RMSEA = .04. Only collective and intimate connectedness prospectively predicted meaning in life ($\beta = .10, p < .001$ and $\beta = .05, p = .012$, respectively). To test whether the coefficients of collective and intimate connectedness differed significantly from each other, we

Table 1. Cross-lagged and stability effects, Study 1.

	Model 1	Model 2
<i>Cross-lagged effects</i>		
Collective connectedness → meaning in life	.10***	.07***
Friends connectedness → meaning in life	.02	.02
Family connectedness → meaning in life	.03	.02
Spouse connectedness → meaning in life	.05*	.01
Meaning in life → collective connectedness	.11***	.08***
Meaning in life → friends connectedness	.08***	.05**
Meaning in life → family connectedness	.08***	.06**
Meaning in life → spouse connectedness	.06***	.05**
<i>Stability effects</i>		
Meaning in life → meaning in life	.29***	.26***
Collective connectedness → collective connectedness	.62***	.59***
Friends connectedness → friends connectedness	.56***	.55***
Family connectedness → family connectedness	.55***	.53***
Spouse connectedness → spouse connectedness	.57***	.57***
<i>Covariate</i>		
Life satisfaction → meaning in life		.14***
Life satisfaction → collective connectedness		.12***
Life satisfaction → friends connectedness		.09***
Life satisfaction → family connectedness		.11***
Life satisfaction → spouse connectedness		.04

Note: Standardized coefficients.
 *** $p \leq .001$; ** $p \leq .01$; * $p < .05$

analyzed a modified model in which we constrained these coefficients to be equal. This model was compared to the first model using a likelihood ratio test. The original model (with free parameters) fit significantly better than the constrained model, ($\chi^2(1) = 5.76, p = .016$), meaning that collective connectedness is significantly more strongly related to meaning in life than intimate connectedness. Meaning in life was prospectively related to all types of connectedness ($\beta_{\text{collective}} = .11, \beta_{\text{relational}} = .08, \beta_{\text{intimate}} = .06$, all $ps < .001$).

In Model 2, we added the effects of life satisfaction at Time 1 on meaning and all types of connectedness at Time 2. This model showed appropriate fit to the data as well, $\chi^2(580) = 7928.68, CFI = .92, TLF = .91, RMSEA = .04$. The lagged effect of collective connectedness on meaning was weaker than in Model 1 but remained significant ($\beta = .07, p < .001$). In contrast, the effect of intimate connectedness was no longer statistically different from zero ($\beta = .01, p = .525$). Overall, these results provide support for Hypothesis 1.

Controlling for life satisfaction at Time 1 reduced the effects of meaning in life on all three types of connectedness, yet all of them remained significantly different from zero (Table 1, Model 2), providing support for Hypothesis 2. Finally, life satisfaction was not only prospectively related to meaning in life, but also positively predicted collective ($\beta = .12, p < .001$), relational ($\beta_{\text{friends}} = .09$ and $\beta_{\text{family}} = .11, p < .001$), and intimate ($\beta = .04, p = .084$) connectedness 10 years later.

Discussion

This study provided first evidence of reciprocal relations between social connectedness and meaning in life. In addition, the present results underscore the importance of differentiating between intimate, relational, and collective connectedness as predictors of meaning in life. After controlling for life satisfaction, only collective connectedness showed robust and stable prospective relations with meaning in life, suggesting that the general sense of belonging to a larger community is a more important (actually, the only significant) source of meaning in life than close attachments, such as closeness to one's family or friends.

Does meaning in life predict social connectedness? In this study, individuals who evaluated their life as meaningful initially felt more connected to their community, family members, friends, and spouse or partner 10 years later, over and above the effects of life satisfaction. However, an important limitation of this study was that both meaning in life and social connectedness were measured with self-reports. In Study 2, we further addressed this limitation and explored the prospective effects of meaning in life on social connectedness by using behavioral indicators of social connectedness. We examined whether meaning in life is related to an increased likelihood of engagement in voluntary associations (collective connectedness) and the timing of marriage and separation (intimate connectedness).

Study 2

Method

Data and participants

The data for this study came from the British Household Panel Survey (BHPS; Taylor, Brice, Buck, & Prentice-Lane, 2009), an annual panel study with a sample of about 10,000 individuals. Measures of meaning in life and life satisfaction were available in Waves 11 (2001) and 16 (2006). Wave 11 was used as baseline in all analyses.

To analyze the effect of meaning in life on membership in voluntary organizations, we selected all participants without missing values on meaning in life, life satisfaction, and memberships at baseline and memberships two years later ($N = 13,134$, 55.0% women, mean age = 45.83, $SD = 17.68$). To analyze the effect of meaning in life on the likelihood and timing of marriage, we selected those participants who were not married (that is, separated, divorced, widowed, or never married) in the baseline year and had no missing values on the variables of interest ($N = 8136$, 57.9% women, mean age = 40.35, $SD = 20.75$). To analyze the effect of meaning in life on the likelihood and timing of separation, we selected those participants who were married in the baseline year and had valid values on the variables of interest ($N = 9269$, 52.1% women, mean age = 49.77, $SD = 14.61$).

Measures

Participants indicated how often they felt that their life had meaning, used as the measure of *meaning in life*, and how often they felt satisfied with the way they life has turned out, used as the measure of *life satisfaction*. Responses (*often, sometimes, not often, never*) were recoded such that higher values indicate higher meaning and satisfaction, respectively.

To measure organizational memberships, participants were asked to indicate whether they actively engaged in organizations, such as voluntary services groups, community or civic groups, etc. (the full list of organizations is presented in the supplemental online materials). Finally, information on participants' current legal marital status was registered every year and used to derive whether marriage or marital separation occurred.

Results

Membership in voluntary organizations

Meaning in life at baseline was positively related to the number of organizational memberships at baseline (memberships: $r = .12$, $p < .001$) as well as two years later ($r = .11$, $p < .001$). Similarly, higher life satisfaction was positively associated with the number of organizational

memberships concurrently ($r = .10$, $p < .001$) and prospectively ($r = .10$, $p < .001$).

To examine whether meaning in life and life satisfaction at baseline predict changes in the number of organizational memberships two years later, we estimated two Poisson regression models, one without and one with life satisfaction as a covariate. Since the distribution of the organizational memberships variable included an excessive number of zeros (51.9 and 55.3% of the participants were not an active member of any organization at Time 1 and 2, respectively), we recurred to a zero-inflated Poisson model (Coxe, West, & Aiken, 2009).

In the first model, we entered meaning in life (standardized) and the number of memberships at baseline. The exponentiated coefficients of these predictors reflect the estimated increase in the number of memberships if the predictor increases by one unit (for meaning in life and life satisfaction, one unit is equal to one standard deviation). The number of memberships at baseline was positively related to the number of memberships two years later ($\exp(b) = 1.55$, $p < .001$). Individuals who considered their life meaningful at baseline were more likely to become an active member of (an additional) voluntary organization two years later ($\exp(b) = 1.11$, $p < .001$). A one standard deviation increase in meaning was associated with an 11% greater probability of active engagement in (an additional) voluntary organization.

In the second model, we examined whether the effect of meaning in life is independent of individual differences in life satisfaction by adding (standardized) life satisfaction at baseline to the model. Both life satisfaction ($\exp(b) = 1.04$, $p < .001$) and meaning in life ($\exp(b) = 1.09$, $p < .001$) were uniquely associated with an increase in the number of organizational memberships. Overall, these results provide support for Hypothesis 3.

Marriage

Of 8136 single individuals in 2001, 1144 (14.06%) got married in the course of the following seven years. Individuals who got married within the observation period scored higher in meaning in life ($M = 3.52$, $SD = .65$) and life satisfaction ($M = 3.34$, $SD = .68$) at baseline compared to those who remained single (meaning: $M = 3.38$, $SD = .72$, $t(1639.202) = -6.57$, $p < .001$, $d = .20$; life satisfaction: $M = 3.17$, $SD = .77$, $t(8134) = -7.04$, $p < .001$, $d = .22$).

Next, we examined whether individual differences in meaning in life explained variations in the timing of marriage. As the information of marital status changes was collected annually, we used discrete time survival analysis, with time measured continuously in years (2001 = '0' until 2008 = '7').

In Model 1 (Table S4), we entered time and meaning in life at baseline. Single individuals with a strong sense

of meaning in life at baseline were more likely to get married within the following seven years than their counterparts with a lower sense of meaning: for every one standard deviation increase in meaning, there was a 21% greater chance of getting married ($\exp(b) = 1.21$, $p < .001$).

In Model 2, we added life satisfaction. This step significantly improved the model fit ($\chi^2(1) = 25.16$, $p < .001$) and showed that, in accordance with prior research, life satisfaction was also positively related to the odds of getting married ($\exp(b) = 1.27$, $p < .001$). Importantly, the effect of meaning in life remained significantly different from zero ($\exp(b) = 1.11$, $p = .005$), providing support for Hypothesis 4.

Additional analyses including interaction terms between time and meaning and between time and life satisfaction suggested that these effects do not change over the course of the seven-year period (meaning \times time: $\exp(b) = 1.00$, $p = .986$; life satisfaction \times time: $\exp(b) = 1.00$, $p = .875$), indicating that the effect of meaning in life on marriage is stable across long time periods.

Marital separation

There were 9269 married participants in 2001. Five hundred and one (5.4%) of them separated legally from their partner within the next seven years. Individuals who experienced marital separation during the observation period scored lower in meaning in life ($M = 3.44$, $SD = .69$) and life satisfaction ($M = 3.16$, $SD = .78$) at baseline compared to those who remained married (meaning: $M = 3.53$, $SD = .66$, $t(552.927) = 2.86$, $p = .004$, $d = .14$; life satisfaction: $M = 3.40$, $SD = .68$, $t(9267) = 7.56$, $p < .001$, $d = .35$).

Next, we examined whether individual differences in meaning in life and life satisfaction at baseline explained variability in the likelihood of separation. In Model 1 (Table S5), we entered meaning in life and time. Higher scores in meaning in life were related to a decreased likelihood of separation ($\exp(b) = .87$, $p = .001$). In Model 2, we entered life satisfaction, which was also negatively associated with the likelihood of separation ($\exp(b) = .72$, $p < .001$). Controlling for life satisfaction completely accounted for the effect of meaning in life on the likelihood of separation, which was reduced to non-significance ($\exp(b) = 1.03$, $p = .590$).

Although meaning in life was positively associated with intimate connectedness (Study 1) and an increased likelihood of marriage (Study 2), it does not appear to lower the risk of marital separation. Why is this the case? Considering that individuals who find their life meaningful experience enhanced agency and approach orientation (Steger et al., 2008), we assume that these individuals might put more efforts into marital

maintenance behaviors and thereby prevent separation, but only if they expect their relationship to last. In contrast, if they consider their relationship to be irreparably damaged, they might actually be more likely to put an end to it. If this reasoning holds true, meaning in life should be related to a decreased likelihood of separation only in individuals who are satisfied with their spouse. We explored this possibility in additional analyses where we estimated the interaction between meaning in life and marital satisfaction.

As the measure of marital satisfaction was only available in 2002 (while meaning in life was measured in 2001), we used the year 2002 as baseline for these analyses. The sample consisted of 7667 individuals who were in a married relationship (52.1% women, mean age = 49.96, $SD = 14.32$). Marital satisfaction was measured with the following item: 'Please tick the number which you feel best describes how dissatisfied or satisfied you are with the following aspects of your current situation: your husband/wife/partner.' The responses were given on a scale ranging from 1 (*not satisfied at all*) to 7 (*completely satisfied*). The results of these analyses showed that the interaction effect between meaning and marital satisfaction was significant ($\exp(b) = .93$, $p = .011$; see Table S5). A simple slope analysis revealed that at low levels of marital satisfaction (one standard deviation below the mean), meaning in life was unrelated to the likelihood of separation ($\exp(b) = .999$, $p = .988$). In contrast, at high levels of marital satisfaction (one standard deviation above the mean), a sense of meaning in life was associated with a decreased likelihood of separation ($\exp(b) = .86$, $p = .039$). This provides partial support for Hypothesis 5: finding life meaningful prevents marital separation only if the marriage appears to go well.

Discussion

Study 2 extended the findings of Study 1 by showing that a sense of meaning in life impacts real-life behavior and life choices, such as joining a voluntary association, getting married, or separating from one's spouse. Specifically, we demonstrated that meaning in life not only predicts the subjective sense of belonging to one's community, but also the willingness to contribute to one's community by actively participating in voluntary associations, such as a neighborhood watch, a voluntary services group, or any other voluntary or civic association.

Meaning in life was also associated with behaviors reflecting intimate connectedness. Individuals with a strong sense of meaning in life had a higher likelihood of getting married than individuals with a weak sense of meaning in life. Also, individuals who find life meaningful were at a lower risk of marital separation, but only if

they were satisfied with their marriages. For individuals who are satisfied with and committed to their spouses, a sense of meaning in life might be related to more frequent marital maintenance behaviors, which, in turn, prevent separation. We attribute this pattern of results to a stronger sense of agency, future orientation, and approach motivation which have been shown to be typical for individuals with high scores in meaning in life (Baumeister et al., 2013; Steger et al., 2008), and encourage future studies to examine this process in more detail.

General discussion

The present research is the first to examine the possibility of bidirectional causal relations between meaning in life and social connectedness. Using a nationally representative sample from the US (Study 1), we showed that a high sense of meaning in life represents both a source and a consequence of increased social connectedness. Drawing on the differentiation between intimate, relational, and collective types of connectedness (Cacioppo & Cacioppo, 2012; Hawkley et al., 2005), we additionally demonstrated that only collective connectedness (i.e. the feeling of belonging to a larger community) was prospectively related to an increased meaning in life. Although this finding challenges some prior results that highlighted the role of connections to one's family (compared to friends) as a main source of meaning (Lambert et al., 2010), it is in line with our predictions derived from multiple theoretical perspectives as well as speculations made previously by other authors (Lambert et al., 2013). From the perspective of the four needs for meaning (Baumeister & Vohs, 2002), feeling liked, recognized, and respected by a larger social group might be a more reliable source of information about one's self-worth and self-efficacy and better satisfy these respective needs than being respected by one's partner or parents. From the perspective of terror management theory, being part of a larger group or a community might represent a source of 'symbolic immortality' and help uncover the meaning of one's existence (Greenberg & Kosloff, 2008). Finally, relative to intimate and relational connectedness, collective connectedness is more likely to have self-expressive and identity-building functions through its voluntary character, both of which are particularly important for achieving a sense of meaning in life (Baumeister et al., 2013).

In addition to providing further support for the effect of social connectedness on meaning, we provided the first evidence that meaning can also be a source of social connectedness. Importantly, our results suggest that a sense of meaning in life is not only related to the subjective perception of being connected, but also drives real-life behaviors and decisions. Specifically, finding life

meaningful is prospectively related to an increase in the number of active memberships in voluntary organizations (a major indicator of collective connectedness; Hawkley et al., 2005). In addition, individuals who find life meaningful have an increased likelihood of getting married and, when satisfied with their marriage, a decreased likelihood of separation.

What are then the mechanisms through which meaning impacts social relationships and the connectedness-related behaviors? On the one hand, individuals who find life meaningful might be more likely to set goals related to social relationships and invest more efforts into finding connections with others. Our finding that meaning in life is prospectively related to an increase in the number of memberships in voluntary organizations can probably be explained by this mechanism. On the other hand, consistent with Stillman and colleagues' (2011) findings, individuals who find life meaningful can be perceived as more attractive interaction partners, which might in turn increase their social integration and connectedness. The evidence of the relationship between meaning and an increased likelihood of marriage demonstrated here might be at least partially explained by this process.

To sum up, a sense of meaning in life might have an effect on how individuals act around others (i.e. seek others' companionship or not) as well as on how others act around them (i.e. seek to affiliate with them or not). We believe that these processes represent the general mechanisms through which meaning in life affects individuals' behavior and the sense of social connectedness. Unfortunately, the available data did not allow us to study this mechanism in detail, which represents a major limitation of the present studies. We encourage future research to examine these processes using more sophisticated methods such as obtaining data from other members of the social network of the participants and analyzing these data using social network analysis or analyses at a group or dyad level.

Another limitation of the present analysis is the use of single-item measures of meaning in life and life satisfaction as well as the restriction of the analysis to behaviors included in BHPS. We hope that future studies will overcome these limitations and examine whether the positive effect of meaning in life can be replicated with respect to a wider variety of behaviors and life outcomes.

Another intriguing question for the future is whether different types of connectedness interact in predicting meaning. According to the meaning maintenance model (Heine, Proulx, & Vohs, 2006), people draw meaning from needs satisfaction. When one of the needs is threatened, people reaffirm meaning in other life domains. This process – named fluid compensation – can also take place within life domains. In other words, low levels of collective connectedness might be compensated by higher levels of intimate or relational connectedness or vice

versa. Hence, we encourage future studies to explore the potential dynamic interactions between the types of connectedness in their effects on meaning in life.

The effect sizes we report might appear trivial at first glance. However, it should be noted that these effect sizes reflect longitudinal rather than cross-sectional relations and should be evaluated by taking into account the stability or autoregressive effects. Given the moderate stability (approx. $r = .30$), a small longitudinal effect size can be considered meaningful (Adachi & Willoughby, 2014). In addition, longitudinal effects often decline as time lags become longer (Cohen, Cohen, West, & Aiken, 2003) and the optimal time lag in panel studies is considered rather short (preferably less than one year, Dormann & Griffin, 2015). Thus, the effect sizes obtained in the present study using a 10-year lag between the measurement occasions might be underestimated and further studies using shorter time lags will be helpful in gaining a better understanding of the magnitude of these effects.

Our findings are not only of theoretical interest, but might also have implications for counseling practice. The importance of social connectedness for mental health has long been acknowledged in counseling research and practice (Townsend & McWhirter, 2005). Our findings pointing at the particular role of collective (rather than intimate and relational) connectedness in increasing the sense of meaning in life might be used to design interventions aimed at increasing well-being and fighting depression.

In summary, the two studies presented here underscored the role of collective connectedness as a source of meaning in life and presented the first evidence of the role of meaning in life in enhancing social connectedness and influencing related life outcomes, such as social engagement, marriage and separation. We hope that these findings will inspire future research to reach a better understanding of the mechanisms linking meaning to life outcomes, as this represents an important task for improving the conditions of human life.

Disclosure statement

No potential conflict of interest was reported by the authors.

Supplemental data

Supplemental data for this article can be accessed here: <http://dx.doi.org/10.1080/17439760.2015.1117127>

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