Honey, I got fired! A Longitudinal Dyadic Analysis of the Effect of Unemployment on Life Satisfaction in Couples

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Honey, I got fired!

A Longitudinal Dyadic Analysis of the Effect of Unemployment

on Life Satisfaction in Couples

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Abstract

Previous research on unemployment and life satisfaction has focused on the effects of unemployment on individuals but neglected the effects on their partners. In the present study, we used dyadic multilevel models to analyze longitudinal data from 2,973 couples selected from a German representative panel study to examine the effects of unemployment on life satisfaction in couples over several years. We found that unemployment decreases life satisfaction in both members of the couple, but the effect is more pronounced for those who become unemployed (*actors*) than for the other couple members (*partners*). In both couple members, the reaction is attenuated if they share the same labor status after the job loss: Actors experienced a greater drop in life satisfaction if their partners were employed than if they were unemployed at the time of the job loss, and partners reacted negatively to the job loss only if they were employed or inactive in the workforce, but not if they were unemployed themselves. With respect to couple-level moderator variables, we found that both actors and partners reacted more negatively to unemployment if they had children. The reaction was also more negative in male actors than in female actors, but there was no difference between male and female partners. In sum, these findings indicate that changes in life satisfaction can be caused by major life events experienced by significant others.

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Honey, I got fired! A Longitudinal Dyadic Analysis of the Effect of

Unemployment on Life Satisfaction in Couples

Job loss and unemployment hurt. Unemployment is associated with a variety of negative physiological and psychological outcomes such as decreased life satisfaction (Carroll, 2007; Lucas, Clark, Georgellis, & Diener, 2004; Winkelmann & Winkelmann, 1998), lower self-esteem (Goldsmith, Veum, & Darity, 1997), diminished locus of control (Goldsmith, Veum, & Darity, 1996), increased mental distress (Clark & Oswald, 1994), and higher rates of psychiatric disorders (Ford et al., 2010; for meta-analyses, see McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Paul & Moser, 2009). Whereas the effects of job loss and unemployment on individuals are well understood, the literature has largely neglected the fact that these effects are likely not limited to those who are unemployed but extend to their spouses and families.

In this paper, we use longitudinal dyadic data to analyze the effects of unemployment on life satisfaction in couples. Life satisfaction is the cognitive component of subjective well-being (SWB) and reflects how people evaluate their lives overall (Diener, Suh, Lucas, & Smith, 1999). In addition to estimating the average life satisfaction trajectories over the transition into unemployment, we examine various individual-level and couple-level moderator variables that may account for individual differences in these trajectories.

The findings of this study will not only help better understand how people deal with unemployment, but they also have broader theoretical relevance. First, studies on stability and change in life satisfaction have almost exclusively focused on individuals and their immediate life circumstances. If we find that unemployment affects partners as well, this will be strong evidence that we need to take a broader perspective on the factors that influence stability and change in life satisfaction. Second, many life events are not only followed, but

also preceded by changes in life satisfaction. For instance, life satisfaction tends to drop up to two years before people become unemployed or get a divorce (Lucas, 2007), and lower life satisfaction is associated with an increased likelihood to move or change jobs and with a decreased likelihood to get married within the next two years (Luhmann, Lucas, Eid, & Diener, 2013). The causal direction in the link between life events and life satisfaction is therefore not entirely clear. Examining couples can help us establishing the direction of causality because we would only expect to see changes in the level of life satisfaction in the partner if life events have an effect on life satisfaction, but not if life satisfaction (of the person who experiences the event) causes the life event.

Spousal Similarity in SWB

Couples tend to have similar levels of SWB (e.g., Bookwala & Schulz, 1996; Hoppmann, Gerstorf, Willis, & Schaie, 2011; Schimmack & Lucas, 2010; Winkelmann, 2005). Spousal similarity is often linked to assortative mating which describes the tendency of people to select partners who are similar to them (e.g., Watson et al., 2004). Hence, similarity in SWB might be a consequence of spousal similarity in other variables such as intelligence (Mascie-Taylor, 1989; Watson et al., 2004), attitudes (Feng & Baker, 1994; Luo & Klohnen, 2005; Watson et al., 2004), and psychiatric disorders including depressive symptoms (Bookwala & Schulz, 1996; Gerstorf, Hoppmann, Kadlec, & McArdle, 2009; Holahan et al., 2007).

Similarity in SWB may also be due to similarities in life circumstances. Married couples typically live in highly similar circumstances, for instance, they usually share the same home, have a common income, and are at least partially exposed to the same stressors. All of these factors may contribute to spousal similarity in SWB (Schimmack & Lucas, 2010; Segrin, Badger, & Harrington, 2012; Song, Foo, Uy, & Sun, 2011). Moreover, because the life circumstances of both couple members are intertwined, changes in the life circumstances

of one partner (e.g., reduction in income due to unemployment) are likely to have an effect on the other partner's SWB.

Finally, partners influence each other's levels of SWB through dynamic processes such as emotional contagion (Hatfield, Cacioppo, & Rapson, 1993) or the crossover of the stress experienced by one couple member to the other couple member (Westman & Vinokur, 1998). Such processes might explain the observed similarity in changes in depression (Desai, Schimmack, Jidkova, & Bracke, 2012), life satisfaction (Powdthavee, 2009; Schimmack & Lucas, 2010; Schwarze & Winkelmann, 2011; Walker, Luszcz, Gerstorf, & Hoppmann, 2011), and happiness (Hoppmann et al., 2011).

In sum, these mechanisms imply that major changes in life circumstances affect both partners in similar ways, but empirical evidence for this hypothesis is scarce because studies on the effects of life events on SWB have typically focused on those individual who immediately experienced the event and rarely considered higher levels of analysis such as the couple, the household, or the broader social network. Those studies that did include couples have typically focused on events that affect both partners equally, such as marriage (Lindahl, Clements, & Markman, 1998) or child birth (Dyrdal & Lucas, 2013). Very little is known about whether life events that only affect one partner directly lead to changes in SWB in both couple members. The present paper fills this gap by examining couple's life satisfaction trajectories before, during, and after an unemployment period experienced by one partner.

Unemployment and SWB

At a given point in time, unemployed persons are, on average, less satisfied with their lives than employed persons (McKee-Ryan et al., 2005). Longitudinal studies show that job loss is associated with a significant drop in life satisfaction and a slow rise in the following months and years (Lucas et al., 2004; Luhmann, Hofmann, Eid, & Lucas, 2012). Moreover, studies on repeated unemployment found that people sensitize to unemployment such that

their level of life satisfaction continues to decrease from one unemployment period to the next (Booker & Sacker, 2012; Luhmann & Eid, 2009). In sum, cross-sectional as well as longitudinal data show that unemployment is associated with decreased life satisfaction. However, these studies are limited because they focus on individuals only.

Cross-sectional studies on the effects of unemployment on couples provide mixed evidence (for a review, see Ström, 2003). In some studies, respondents whose partner was unemployed at the time of the survey reported significantly more spousal conflict (Broman, Hamilton, & Hoffman, 1990) and less family and marital satisfaction (J. H. Larson, 1984) than respondents whose partners were employed. Moreover, couples with one unemployed partner have an increased risk of marital separation and divorce (Ström, 2003; Vinokur, Price, & Caplan, 1996). Other studies, in contrast, failed to find significant differences between respondents with unemployed partners and respondents with employed partners (Aubry, Tefft, & Kingsbury, 1990) or found that only partners of male unemployed individuals, but not partners of female unemployed individuals, report more distress (Howe, Levy, & Caplan, 2004) and less life satisfaction (Knabe, Schöb, & Weimann, 2012) than partners of employed individuals.

It is important to note, however, that cross-sectional designs only allow conclusions about differences between people but not about whether the observed interindividual differences are due to changes triggered by the job loss or due to pre-existing differences. A range of longitudinal studies found that respondents whose partners became unemployed report higher distress levels, more depression symptoms, higher anxiety, and impaired mental health than before their partners' job loss (Clark, 2003; Dew, Bromet, & Schulberg, 1987; Liem & Liem, 1988; Penkower, Bromet, & Dew, 1988; Song et al., 2011; Westman, Etzion, & Horovitz, 2004; Westman & Vinokur, 1998). In contrast, a study of older couples found no significant changes in wives' depressive symptoms after their husbands' involuntary job loss

(Siegel, Bradley, Gallo, & Kasl, 2003). Likewise, the only longitudinal study that examined changes in life satisfaction failed to detect significant changes in the partners of the unemployed persons (Carroll, 2007). Hence, the longitudinal evidence is almost as ambiguous as the cross-sectional evidence.

Limitations of Previous Studies

The empirical evidence on the effects of unemployment on life satisfaction is mixed, and most studies are subject to at least one of the following limitations. First, many studies used inadequate research designs, for instance, cross-sectional designs, or longitudinal designs without any pre-event measures and with short time frames (the maximum duration of previous studies was 2 years; Penkower et al., 1988).This study duration allows examining the initial reaction to unemployment, but it is not possible to study the long-term effects of unemployment on both partners. Moreover, it is not possible to examine how the end of unemployment affects life satisfaction because few or no couples experience reemployment during the short study period. In the present study, we address this limitation by examining the trajectories of life satisfaction over several years before, during, and after unemployment using prospective longitudinal data covering, on average, 8.5 years ($SD = 5.3$) after the job loss.

A second limitation is that most studies are based on small and highly selective samples. For instance, some researchers did not interview both partners of a couple at all (e.g., Broman et al., 1990; Penkower et al., 1988), did not interview both partners at every wave (Dew et al., 1987) or examined only unemployed husbands and their wives, but not unemployed wives and their husbands (Dew et al., 1987; J. H. Larson, 1984; Liem & Liem, 1988; Penkower et al., 1988; Siegel et al., 2003). Finally, some samples were selective in terms of socio-economic status (e.g., only factory workers in Liem and Liem, 1988). In the present study, we use data from a sample that is nationally representative of German

households (Socio-Economic Panel [SOEP]; Wagner, Frick, & Schupp, 2007) and therefore includes unemployed men and women from all educational and economic backgrounds.

Third, a host of studies have examined the effects of economic stress on couples and families (e.g., Bradley & Corwyn, 2002; Conger et al., 1992, Ström, 2003); however, studies on unemployment and well-being are much rarer (see review above), and only one longitudinal study (Carroll, 2007) examined life satisfaction as an outcome. Moreover, although we know quite a bit about the effects of unemployment on life satisfaction on individuals (e.g., Lucas et al., 2004), we know almost nothing about its effects on couples. The present paper fills this gap in the literature by using life satisfaction as an outcome.

Finally, little is known about moderators of the effect of unemployment on couples. One exception is the study by Howe and colleagues (2004) who found that depressive symptoms of people who are unemployed were only transmitted to the partner if the unemployed was male and the partner female, but not if the unemployed was female and the partner male. In the present study, we examine several individual-level and couple-level moderators of individual differences in the life satisfaction trajectories in both partners.

Research Objectives and Hypotheses

According to theories on spousal similarity in SWB, one would expect that unemployment should not only affect the unemployed persons themselves, but also their partners. However, the empirical evidence is mixed, and previous studies are limited in terms of the used research design, samples, outcome measures, and moderator variables. The present study is the first to use prospective longitudinal dyadic data from a large, nationally representative sample. Because of this strong data base, this study will provide a much more precise estimate of the true effect of unemployment on couples and thereby dissolve the ambiguity of previous research. In addition, we examine a range of moderator variables that have received no or little attention in the literature.

Our study was guided by the following main research objectives: First, we describe the average life satisfaction trajectories of couples over the transition into and out of one person's unemployment using multi-wave longitudinal and nationally representative data. Using standard dyad modeling terminology, we henceforth refer to the person who becomes unemployed as the *actor* and to the partner as the *partner*. Second, we examine whether the trajectories differ as a function of the partner's labor status. This analysis may allow conclusions about the processes through which unemployment affects the life satisfaction of couples. Finally, we include three couple-level moderator variables: relationship duration, presence of children, and gender. We now present the specific hypotheses for each of these research objectives.

Average Trajectories

Individuals typically experience a drop in life satisfaction as they become unemployed and a rise in life satisfaction as they become reemployed (Lucas et al., 2004; Luhmann, Hofmann, et al., 2012). Based on the theories on partner similarities discussed above, we hypothesize similar (but possibly weaker) effects of unemployment on the level of life satisfaction of partners. In addition to reemployment, we also examine how life satisfaction changes in both couple members if the unemployment ends through a withdrawal from the workforce (e.g., retirement). Furthermore, we expect that the trajectories of both couple members are correlated as previous studies have found that couples experience similar changes in SWB over the life span (Hoppmann et al., 2011). To disentangle the economic and psychological effects of unemployment, we control for household income in all models.

Labor Status of Partner

The extent to which the actor's job loss affects the partner's life satisfaction may depend on the labor status of the partner. Conversely, the labor status of the partner may

affect the actor's reaction to job loss. We had two competing hypotheses for these effects (cf. Clark, 2003; Knabe et al., 2012). Note that both of these hypotheses refer to the change in life satisfaction experienced at job loss (i.e., the reaction to unemployment), not to the absolute level of life satisfaction after the job loss (which is a function of the level of life satisfaction before job loss and the magnitude of the reaction to job loss).

According to the financial-stress hypothesis, the effects of one person's job loss are attenuated if the other person is still employed, primarily because the economic consequences associated with unemployment can be partially compensated by the other person's employment. Hence, we would expect that life satisfaction decreases most among those couples where the other person is already unemployed at the time of job loss.

The shared-fate hypothesis, in contrast, is based on the idea that couples benefit if they share similar past experiences (e.g., job loss), lead a similar daily life, or have a similar social status. This shared fate allows them to be more empathic (e.g., Barnett, Tetreault, Esper, & Bristow, 1986; Batson et al., 1996) and thus more supportive of their respective partner (cf. Eisenberg & Miller, 1987). Moreover, being unemployed may be less threatening if the partner is unemployed as well because being unemployed is the social norm within the household (Clark, 2003). This hypothesis has been supported empirically in a longitudinal study examining affective well-being (Clark, 2003) and in a cross-sectional study examining both affective well-being and life satisfaction (Knabe et al., 2012; but cf. Scutella & Wooden, 2008, who did not find this effect for affective well-being), but not yet in a longitudinal study examining life satisfaction.

In our study, we distinguish between three labor status categories: unemployed, active in the workforce (i.e., part-time or full-time employed, including self-employed), and inactive (all other categories including retired and being a homemaker). In the year of the job loss, the couple members are most similar in terms of labor status if the partner is unemployed as well.

Couples where the partner of the unemployed person is inactive may have a similar everyday life but do not share the same social status. Finally, couples where the partner of the unemployed person is active in the workforce are the least similar because they lead very different everyday lives. Hence, the shared-fate hypothesis predicts that for both couple members, the reaction to unemployment is strongest (i.e., most negative) among those actors whose partners are currently employed because their lives become more dissimilar through the job loss. The reaction to unemployment should be weakest among those actors whose partners are currently unemployed themselves because their lives become more similar through the job loss.

Couple-Level Moderators

We examined three couple-level moderators of individual differences in the trajectories: the presence of children, relationship duration, and the gender of the unemployed individual. In individuals, having more dependents is associated with lower well-being during unemployment (McKee-Ryan et al., 2005). However, children may also buffer some of the psychological consequences of unemployment (Artazcoz, Benach, Borrell, & Cortès, 2004), for instance because having children forces parents to keep a regular daily schedule which is associated with higher well-being during unemployment (McKee-Ryan et al., 2005).

We did not have any a priori hypotheses about the role of relationship duration. On the one hand, marital satisfaction tends to decrease with increasing relationship length (e.g., Bradbury & Karney, 2004; Luhmann, Hofmann, et al., 2012) which may make couples potentially more vulnerable to adverse events. On the other hand, couples' positive communication skills tend to increase with increasing relationship length (e.g., Lindahl et al., 1998). In this sense, couples who have been together for long time periods might be better equipped to cope with unemployment than couples who have been together for only a few years.

Finally, we examined the gender of the actor as a moderator. As discussed above, most research on unemployment in couples has focused on couples where the husband was the one to lose the job, and it is therefore unclear whether men and women differ in their reactions to their partner's job loss. The evidence on gender differences in the reaction to unemployment is mixed (see meta-analyses by Luhmann, Hofmann, et al., 2012; McKee-Ryan et al., 2005); however, studies using German data (including studies using the SOEP) typically find that unemployed men report, on average, lower life satisfaction than unemployed women (e.g., Lucas et al., 2004), particularly if they are in a stable relationship (Knabe et al., 2012). If partners change in response to their spouses' job loss solely because the actors' decreased life satisfaction is transmitted to the partners, we would expect that partners of male actors report a stronger decrease in life satisfaction at job loss than partners of female actors.

Method

Sample

We analyzed waves 1 to 26 of the German Socio-Economic Panel (SOEP), a nationally-representative longitudinal study of private households in Germany (Wagner et al., 2007). The SOEP has been used before to study the effects of unemployment on life satisfaction (e.g., Lucas et al., 2004; Luhmann & Eid, 2009), but these analyses were restricted to individuals. The present paper is the first to use the dyadic information available in the SOEP to study unemployment and life satisfaction. We selected couples who fulfilled the following criteria.

First, couples were defined as participants who identified each other as their (married or non-married) partners and lived in the same household. Second, at least one of the partners had to become unemployed (i.e., officially registering as being unemployed and seeking

employment) during the participation in the SOEP. At least two pre-job loss years and at least

three post-job loss years (including the year of job loss) were required to allow us to model

changes within these time periods. Third, the couples had to live together for at least these

five years. Couples who got separated by divorce, death of one member, or by moving into

two separate households during these years were excluded. The same applied to couples who

moved in together less than two years before the unemployment period and to unemployed

individuals who shifted directly from one relationship into the next during that time period.

Fourth, couples where the partner also became unemployed during this time period were

included; however, if both partners fulfilled the inclusion criteria (i.e., data available for at

least two pre-job-loss years and at least three post-job-loss years), the members of the couple

were randomly assigned to be either actor or partner. This applied to 555 couples. Finally, we

dropped 16,943 measurement occasions at which the two couple members were not yet (if

they occurred three or more years before the job loss) or not any more (if they occurred three

or more years after the job loss) living in the same household.

Our final subsample contained 2,973 couples who provided a total of 87,032

occasions. On average, each couple provided 14.6 waves ($SD = 6.5$). Descriptive statistics for

these couples are reported in Table 1.

Measures

Life Satisfaction. Life satisfaction was measured with the following question: "All

things considered, how satisfied are you with your life as a whole?" The response scale

ranged from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). The estimated reliability

of this item is above .70 (Lucas & Donnellan, 2012). To account for fluctuations in the

average life satisfaction levels due to historical events, the life satisfaction scores were

centered on the mean of all SOEP participants within each year (cf. Luhmann & Eid, 2009).

Labor Status. Information on the beginning and end of the unemployment period was derived from retrospective labor status data available in the SOEP. Information on the actor's labor status during the post-job-loss period and on the partner's labor status were taken from data on the labor status at the time of the survey. We distinguished between three mutually exclusive labor status categories: *unemployed*, *active* (i.e. part-time or full-time employed or self-employed), and *inactive* (all other options, including being retired, being on leave, studying, and being a homemaker).

Worry about Job Security. Each year, employed participants were asked to rate the extent to which they were currently worried about job security. The response options were 1 (*not concerned at all*), 2 (*somewhat concerned*), and 3 (*very concerned*). Participants who were unemployed or inactive did not complete this item.

Income. Income was measured in terms of net household income in Euros (i.e., the score for a particular year is the same for both partners). We calculated the logarithm and centered income on the couple-specific average income across all years. Thus, a value of zero reflects a couple's average log-income across all years that were considered in the study.

Children. We created a dummy variable reflecting child status before unemployment. This variable was coded with 1 if there was at least one child under 16 years living in the household in at least one year before job loss, and with 0 if the couple had no children under the age of 16 living with them before the job loss. Couples who delivered a child during or after the unemployment period were also coded with 0.

Relationship Duration. Relationship duration was defined as the number of years before the unemployment period that the couple had lived in the same household. The variable was centered on the grand mean of our sample.

Gender and Age. The gender of the actor was dummy coded with $0 =$ male and $1 =$ female. Age was measured in terms of age of the actor in the first year of unemployment and centered on the grand mean of our sample.

Statistical Analysis

The analysis of longitudinal dyadic data requires a special statistical model. Bolger and Shrout (2007) give an overview of currently available multilevel models for longitudinal dyadic data. They show that these models differ mainly in how they handle the error structure. Because we expected that the error variance and the autoregressive structure might be different for actors and partners, we analyzed the data using the SAS packet PROC MIXED which is currently the only available program that allows the specification of such an error structure (for technical details, see appendix). The multilevel model for longitudinal dyadic data permits the simultaneous estimation of two individual growth curves for each partner, controlling for the interdependency between the partners' scores (Lyons & Sayer, 2005). Furthermore, it allows us to model pre-event levels of life satisfaction, intra-individual changes from these pre-event levels, and intra-individual and intra-couple correlations between these changes.

We report three models. In Model 1, we focused on within-person changes in life satisfaction in both partners, controlling for fluctuations in household income. In Model 2, we added the partner's labor status at the time of the interview to determine whether changes in life satisfaction differ as a function of whether the partner is unemployed, active, or inactive in the workforce. Finally, in Model 3, we added a number of couple-level variables to explain individual differences in the trajectories.

In this section, we describe the most basic model. Details on Models 2 and 3 will be presented together with the results. For simplicity, we focus on the individual growth curve model first. We call this the basic growth model. To extend this model to dyads, every time

parameter described here (e.g., intercept, slopes) will be modeled twice: once for the person who becomes unemployed and once for the partner (for a more technical account of this model, see the model equation in the appendix). The variables and their interpretation are summarized in Table 2. In addition, the interpretation of the key parameters is illustrated in Figure 1.

The intercept coefficient of the basic growth model reflects the average level of life satisfaction in the first year of unemployment (coefficients B_{A0} and B_{P0} in Figure 1). Since life satisfaction was centered on the mean of the total (nationally representative) sample within each year, a significant negative coefficient indicates that the average level of life satisfaction in our subsample in this year is significantly lower than the average level in the general population.

Changes before and after the first year of unemployment were modeled separately. Henceforth, we refer to the period before the first year of unemployment as *pre-job loss* and to the period after the first year of unemployment as *post-job loss*. Note that in a given year of the post-job-loss period, the actor may or may not be unemployed (see below).

Change during the pre-job-loss period was modeled with two variables: a dummy variable that was coded with 1 in all pre-job-loss years and 0 in all subsequent years, and a linear change variable that counted the number of years *until* the year of job loss with $0 = $ one year before job loss and all subsequent years, $-1 = $ two years before job loss, $-2 = $ three years before job loss, and so forth. The coefficient of the pre-job-loss dummy variable (coefficients B_{A1} and B_{P1} in Figure 1) therefore reflects the difference between the average level of life satisfaction in the year in which the job loss occurred and the average level of life satisfaction in the last pre-job-loss year. A significant *positive* coefficient would indicate that the average level of life satisfaction was significantly higher in the year before the job loss than in the year of the job loss and that people reacted *negatively* to becoming unemployed. The

coefficient of the linear change variable reflects the rate of linear change during the pre-job-loss period. A negative coefficient would indicate that the level of life satisfaction decreases as one approaches unemployment.

Linear changes during the post-job-loss period are modeled by introducing a linear change variable that counts the number of years since the job loss with 0 = all pre-job-loss years and the year of job loss, and 1 = one year since job loss, 2 = two years since job loss, and so forth. The coefficient of this variable hence reflects the rate of linear change after the beginning of the post-job-loss period.

In addition, we included two dummy variables reflecting changes in the labor status of the actor during the post-job-loss period. The dummy variable *active labor status* is coded with 1 in all post-job-loss years when the actor was active in the workforce which means that this person has either a part-time or a full-time job or is self-employed at the time of the interview. The dummy variable *inactive labor status* is coded with 1 in all post-job-loss years when the actor was not active in the workforce and not unemployed. Inactive labor status includes a range of non-working activities such as being retired, being on leave, or staying at home as a homemaker. The two dummy variables are mutually exclusive and coded such that they capture every possible labor status except being unemployed. The respective coefficients hence represent the change in life satisfaction experienced by the actor and the partner as the actor transitions from unemployment to reemployment (coefficients B_{A3} and B_{P3} in Figure 1) or from unemployment to inactive labor status (not illustrated).

Furthermore, both dummy variables are allowed to interact with the post-job-loss linear change variable. The coefficients of these interaction terms reflect the degree to which the linear rate of change in life satisfaction changes as a result of transitions from unemployment to reemployment or from unemployment to inactive labor status, respectively.

The basic growth model was extended to dyadic data which means that every

parameter described above is modeled twice: once for the actor and once for the partner. One

implication of this modification is that the model now contains two intercepts. This was

technically achieved by dropping the regular intercept from the model and by including an

intercept variable for each couple member that is coded with 1 on all occasions (see Table 2

for details).

In addition, we included household income as a covariate in all models to ensure that

the observed trajectories, particularly those of the partners, were not just due to fluctuations

in household income. The two intercept variables and the two pre-job-loss dummy variables

were modeled as random and were therefore allowed to covary across individuals. This

allowed us to examine whether the actor's reaction to unemployment is related to the

partner's reaction. Due to difficulties with model identification and limited computational

power, all other variables were modeled as fixed.

Results

Average Trajectories

The regression coefficients for Model 1 are provided in Table 3. In the year of job

loss, the average estimated level of life satisfaction was B_{A0} = -0.56, $p < .001$ for actors and

B_{P0} = -0.32, $p < .001$ for partners with average household income.[1] Note that since life

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[1] To gauge the extent to which controlling for income influences these estimates, we dropped income
from the model in an ancillary analysis. In this model, all coefficients of interest were very similar to the ones in
the model including income, suggesting that changes in household income have little explanatory power for
changes in life satisfaction due to unemployment. The coefficients of the intercept variables were B_{A0} = -0.58, p
$< .001$ for actors and B_{P0} = -0.35, $p < .001$ for partners; the coefficients of the pre-job-loss dummy variables
were B_{A1} = 0.43, $p < .001$ for actors and B_{P1} = 0.17, $p < .001$ for partners; the coefficients of the *active labor
status* dummy variables were B_{A3} = 0.37, $p < .001$ for actors and B_{P3} = 0.14, $p < .001$ for partners; and the

satisfaction was centered on the total sample mean, these scores indicate that in this year, the

level of life satisfaction was significantly below the population mean for both actors and

partners. A linear contrast of these two coefficients indicated that the difference between

actor and partner life satisfaction was significant, $C = 0.24$, $t(2937) = 8.42$, $p < .001$. The

correlation between the random effects of the actor and partner intercept variables was $r = .76$

which means that across couples, actors with higher life satisfaction tend to have partners

with higher life satisfaction.

The coefficients of the pre-job-loss dummy variables reflect the difference between

the average levels of life satisfaction in the year immediately prior to the job loss and in the

year when the job loss occurred for actors and partners, respectively. A positive coefficient

indicates that the average level of life satisfaction was higher in the previous year which

means that the participants experienced, on average, a drop in their life satisfaction. In our

model, the coefficients were significant and positive for both actors and partners, $B_{A1} = 0.41$,

$p < .001$ and $B_{P1} = 0.15$, $p < .001$, respectively, indicating that both couple members had

significantly higher life satisfaction in the year immediately before the job loss and hence

reacted negatively to the job loss. As can be seen in Figure 2, the levels of life satisfaction

before job loss were similar in both actors and partners. This means that the differences in life

satisfaction in the first year of unemployment are not due to pre-existing differences (such

that the actor had lower life satisfaction than the partner to start with) but only appeared after

the actor became unemployed. The difference between the two coefficients was significant, C

$= 0.26$, $t(2855) = 8.66$, $p < .001$, indicating that actors react significantly more strongly to job

loss than partners. The random effects of the two pre-job-loss dummy variables were strongly

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coefficients of the *inactive labor status* dummy variables were $B_{A4} = 0.17$, $p < .001$ for actors and $B_{P4} = 0.09$, $p = .042$ for partners.

correlated with $r = .78$: The stronger the reaction to unemployment in the actor, the stronger

is the reaction to unemployment in the partner.

The coefficients of the two dummy variables *active labor status* and *inactive labor*

status reflect the shift in life satisfaction in response to the actor finding reemployment or

transitioning into inactive labor status, respectively. All coefficients were positive and

significant (see Table 2), indicating that the end of unemployment is generally associated

with an increase in life satisfaction in both actors and partners. A comparison of these

coefficients by means of linear contrasts reveals that actors experience a significantly greater

increase in life satisfaction if they find a new job than if they become inactive, $C = 0.15$, $t(df$

$> 67,000) = 2.85$, $p = .004$. Moreover, actors experience a greater increase in life satisfaction

than partners if they find a new job, $C = 0.22$, $t(df > 67,000) = 5.66$, $p < .001$, but not if they

become inactive, $C = 0.06$, $t(df > 67,000) = 1.23$, $p = .218$. Finally, the increase experienced

by partners of actors who became reemployed does not differ from the increase experienced

by partners of actors who became inactive, $C = -0.01$, $t(df > 67,000) = -0.22$, $p = .863$.

How do the increases in life satisfaction at the end of unemployment compare to the

decreases in life satisfaction at the beginning of unemployment? Among actors, neither

finding a new job nor becoming inactive can offset the negative effects of job loss on life

satisfaction. For both transitions, the respective coefficients are significantly smaller than the

coefficient of the pre-job-loss dummy variable, $C = -0.08$, $t(2925) = -2.13$, $p = .033$ for

reemployment and $C = -0.23$, $t(2925) = -4.83$, $p < .001$ for inactive labor status. Among

partners, however, the coefficients of the two transition variables did not differ significantly

from the coefficient of the pre-job-loss dummy variable, $C = -0.04$, $t(2855) = -1.20$, $p = .229$

for reemployment and $C = -0.03$, $t(2855) = -0.71$, $p = .480$ for inactive labor status. These

results suggest that the effects of positive and negative work events are asymmetric in actors

and symmetric in partners.

During both the pre-job-loss period and the post-job-loss period, the coefficients of the linear variables were significant and negative for both partners, indicating that the average level of life satisfaction tends to decrease before and after the job loss. This means that even in partners, the level of life satisfaction in the first year after the end of unemployment is below the level of life satisfaction in the last year before the job loss because life satisfaction continues to decrease during the unemployment period (cf. Figure 2). This negative trend is stopped, however, as soon as the unemployment ends. For both types of transitions and for both actors and partners, the coefficients of the interactions between the linear variable and the transition dummy variables are positive and significant, which means that the rate of change in life satisfaction is less positive and, for actors, close to zero after the actor finds reemployment or becomes inactive (see Table 3).

Partner Labor Status as Moderator

In Model 2, we examined the extent to which the reaction to job loss in both actors and partners varies as a function of the current labor status of the partner. Similar to the actor's labor status after unemployment, the partner's labor status was categorized as unemployed, active (i.e. part-time or full-time employment) or inactive (e.g., retired, homemaker). Here, the partner's labor status was measured by two dummy variables: *partner unemployed* (0 = not unemployed, 1 = unemployed) and *partner active* (0 = not active, 1 = active). Inactive labor status of the partner served as the reference category. The intercept coefficients now reflect the average level of life satisfaction at job loss among couples where the partner was inactive in this year, and the main effects of the partner labor-status variables reflect the mean-level difference in life satisfaction at job loss between the couples with inactive partners and couples with unemployed or active partners, respectively. Finally, the interactions between the labor-status dummy variables and the pre-job-loss dummy variables

reflect the extent to which the change in life satisfaction experienced at job loss varies as a

function of the partner's labor status.

The regression coefficients are reported in Table 4 and the estimated levels of life

satisfaction in the year before the job loss and the year of job loss for the six groups (actors

with active, inactive, or unemployed partners, and partners who are active, inactive, or

unemployed) are depicted in Figure 3. We begin with the life satisfaction trajectories of the

actors. As in Model 1, a positive value of the coefficient of the pre-job-loss dummy variable

indicates that the level of life satisfaction was higher in the year immediately before the job

loss than in the year of job loss. For actors, this coefficient was $B_{A1} = 0.34$, $p < .001$,

meaning that actors with inactive partners (i.e., the reference group) experienced a significant

drop in life satisfaction at job loss. The average level of life satisfaction at job loss of this

group is reflected in the actor intercept, $B_{A0} = -0.49$, $p < .001$.

In comparison, actors with partners who were unemployed and actors with partners

who had a job reported significantly lower life satisfaction at job loss, as reflected in the

coefficients of the variables *partner unemployed dummy*, $B_{A8} = -0.27$, $p < .001$, and *partner

active labor status dummy*, $B_{A9} = -0.07$, $p = .025$. The difference in life satisfaction between

actors with unemployed partners and actors with inactive partners existed even before the job

loss: The interaction between the pre-job-loss dummy variable and the variable *partner

unemployed* reflects how much weaker (or greater) the drop in life satisfaction experienced

by actors with unemployed partners is relative to actors with inactive partners. The

coefficient $B_{A7} = 0.04$, $p = .600$ indicates that the estimated drop in life satisfaction among

actors with unemployed partners was 0.04 points greater than the drop in life satisfaction

among actors with inactive partners, resulting in a net drop in life satisfaction of $0.34 + 0.04$

$= 0.38$ (see printed value in Figure 3). Since the interaction was non-significant, the reaction

to job loss did not differ between these two groups. This was different for actors with

employed partners. Consistent with the shared-fate hypothesis, actors whose partners are employed at the time of the job loss show a significantly more negative reaction than actors whose partners are either inactive or unemployed themselves, $B_{A11} = 0.10$, $p = .027$, resulting in a net drop in life satisfaction of $0.34 + 0.10 = 0.44$. Recall that positive values indicate a drop in life satisfaction because they are computed as the level of life satisfaction before the job loss minus the level of life satisfaction at job loss.

Partners who are inactive in the workforce report an average level of life satisfaction of $B_{P0} = -0.41$, $p < .001$ in the year of job loss (partner intercept in Table 4 and Figure 3, bottom panel). In this group, the level of life satisfaction in the year immediately before the job loss was significantly higher than in the year when the job loss occurred, as indicated by the coefficient of the pre-job-loss dummy variable, $B_{P1} = 0.19$, $p < .001$. Partners who have a job fare significantly better. Their level of life satisfaction at job loss is significantly higher compared to those who are inactive, $B_{P9} = 0.18$, $p < .001$ (*partner active labor status dummy*). The interaction between partner active labor status and the pre-job-loss dummy variable is not significant, $B_{P11} = -0.05$, $p = .251$, which means that the net drop in life satisfaction among active partners ($0.19 - 0.05 = 0.14$; see Figure 3) does not differ from the drop experienced by partners who are inactive at that time. Thus, partners with jobs have constantly higher life satisfaction than partners who are inactive.

A very different pattern can be found for partners who are unemployed themselves. Relative to inactive partners, their level of life satisfaction is significantly lower in the year of job loss, $B_{P8} = -0.44$, $p < .001$ (*partner unemployed dummy*). Moreover, the interaction between partner unemployed and the pre-job-loss dummy variable is $B_{P10} = -0.17$, $p = .015$. This coefficient has to be interpreted relative to the main effect of the pre-job-loss dummy variable which is $B_{P1} = 0.19$, $p < .001$. Thus, the net change in life satisfaction of partners

who are unemployed themselves is estimated as $0.19 - 0.17 = 0.02$, meaning that their level of life satisfaction does not change in response to the actor's job loss (see Figure 3).

In sum, these findings are consistent with both the financial-stress hypothesis and the shared-fate hypothesis. Couples where both members are unemployed are, on average, the least satisfied; however, actors and partners alike react significantly more strongly to the unemployment if the partner is working and the job loss makes their lives less similar.

In an additional analysis, we examined whether partner labor status moderated the reaction to the end of the actor's unemployment (either through becoming reemployment or withdrawing from the workforce). In this model, only one interaction effect was significant: Partners of actors who withdraw from the workforce react significantly less positively if they have a job than if they are inactive themselves, $B = -0.15$, $p < .001$.

Ancillary analysis: Worry about Job Security

Above, we found that both active and inactive partners experience a significant drop in life satisfaction in response to the actors' job loss, and the magnitude of this drop does not differ between active and inactive partners. From an economic perspective, this effect is more expected for inactive partners than for active partners because inactive partners are more likely to be economically dependent on the actors. Moreover, inactive partners are more likely to experience a change in their everyday routine because they are at home with the unemployed actor whereas the daily life of active partners presumably changes less as they continue to go to work every day.

So why do partners with jobs experience a drop in life satisfaction as well? One plausible explanation that we can test with the available data is that because actors and partners share the same labor market, the actors' job loss increases worries about job security in their partners which in turn lowers their partners' levels of life satisfaction (cf. Knabe & Rätzel, 2011). To test this hypothesis, we estimated a multilevel mediation model for a

subsample of employed partners where we tested whether the changes in life satisfaction due to the actor's job loss are mediated by changes in worry about job security. In this model, the same time variables as in our Model 1 were used as predictors (i.e. pre-job-loss dummy variable, pre-job-loss linear change, and post-job-loss linear change). Worry about job security was the mediator, and life satisfaction was the outcome. Hence, this model allowed us to estimate changes in worry about job security (*a* path in standard mediation terminology), changes in life satisfaction over the transition to unemployment, controlling for worry about job security (*c'* path), as well as the association between worry about job security and life satisfaction (*b* path). Worry about job security was treated as a continuous variable and centered on the grand mean. The analysis was conducted in Mplus 5 (Muthén & Muthén, 2007). The confidence interval of the indirect effect ($a \cdot b$) was estimated using Monte Carlo simulation (Selig & Preacher, 2008).

Similarly to the results for the total sample above, the average level of life satisfaction in the year of job loss was below the population mean, $B = -0.11$, $p < .001$, and life satisfaction was significantly higher in the year prior to job loss, $B = 0.10$, $p = .002$, controlling for worry about job security (*c'* path). Moreover, the coefficients of the linear change variables were negative both before unemployment, $B = -0.01$, $p = .019$, and after the beginning of unemployment, $B = -0.10$, $p = .037$.

More worry was associated with lower life satisfaction, $B = -0.58$, $p < .001$ (*b* path). However, we found no evidence that worry about job security mediated the link between job loss and life satisfaction. When worry about job security was examined as the outcome (*a* path), the coefficient of the pre-job-loss dummy variable was not significantly different from zero, $B = 0.02$, $p = .296$. Furthermore, the indirect effect of the pre-job-loss dummy on life satisfaction via worry about job security ($a \cdot b$) was not significant, $B = -0.01$, 95% CI [-0.028; 0.008]. However, worry did increase in the years leading up to the job loss, as

indicated by the coefficient of the pre-job-loss linear change variable, $B = 0.01, p < .001$.

Finally, worry did not change in the years after the job loss, $B = -.001, p = .755$. Together, these findings suggest that the sudden drop in life satisfaction observed at the time of job loss in employed partners cannot be attributed to a sudden increase in worries about job security.

Couple-Level Moderators

In Model 3, we examined whether the reaction to unemployment is moderated by the couple-level variables presence of children, relationship duration, and actor gender. In addition, we control for the actors' age at job loss as age is confounded with relationship duration (see Table 1). The regression coefficients for this model are reported in Table 5.

Recall that child status and actor gender were dummy-coded (1 = children present and 1 = female, respectively), and relationship duration was centered on the grand mean. The coefficients of the level-1 variables therefore reflect the life satisfaction trajectories among male actors and partners who have been together for an average number of years and who do not have children (henceforth: reference group). In the year of job loss, the average levels of life satisfaction in the reference group were below the population mean in both actors, $B_{A0} = -0.50, p < .001$, and partners, $B_{P0} = -0.14, p = .013$. Relative to the year of job loss, the level of life satisfaction in the last year of employment was significantly higher in actors, $B_{A1} = 0.43$, $p < .001$, but not in partners, $B_{P1} = 0.05, p = .245$. This finding indicates that male partners without children and with average relationship duration do not react to the actors' job loss. An inspection of the interactions between these level-2 variables and the pre-job-loss dummy variables among partners suggests that this effect is mainly due to a significant difference between partners with and without children: Partners with children react significantly more strongly to job loss than partners without children, $B_{P7} = 0.17, p < .001$. In contrast, relationship duration and actor gender did not account for any differences in the reaction of partners to job loss.

Child status also accounted for mean-level differences in life satisfaction after job loss. Compared to persons without children, both actors and partners with children had, on average, lower life satisfaction levels in the post-job-loss period, B_{A6} = -0.34, p < .001, and B_{P6} = -0.35, p < .001, respectively. Just as partners, actors react more strongly to job loss if they have children than if they do not, B_{A7} = 0.14, p = .004. Note, however, that the absolute values of the interaction effects were smaller than the main effects reported above. This means that some of the life-satisfaction differences between couples with and without children observed during the post-job-loss period existed already before the actual job loss.

Life satisfaction did not vary significantly as a function of relationship duration in partners, B_{P8} = 0.006, p = .345. Among actors, however, longer relationship duration was significantly associated with higher life satisfaction, B_{A8} = 0.013, p = .039. Relationship duration did not moderate the strength of the reaction to job loss in neither actors nor partners.

Finally, we were interested in whether the effects of unemployment on couples depend on the gender of the unemployed actor, controlling for child status, relationship duration, and age. Relative to male actors, female actors had significantly higher levels of life satisfaction during the post-job-loss period, B_{A10} = 0.24, p < .001, which is partially due to a significantly weaker drop in life satisfaction from the last year before the job loss to the year of job loss, B_{A11} = -0.13, p = .004. In contrast, the life satisfaction trajectories of the partners were not moderated by the gender of the actor (see Table 5).

Discussion

A large literature indicates that unemployment has substantive and lasting detrimental effects on well-being (Luhmann, Hofmann, et al., 2012; McKee-Ryan et al., 2005). Most of this research, however, has focused on the unemployed individual. Studies that examined the effects of unemployment on the partners or other family members are comparatively rare, are

restricted by various methodological limitations, and come to mixed results. The present

study is one of the first to track life satisfaction in a nationally representative sample of

couples over several years before, during, and after a period of unemployment, allowing us to

examine both short-term and long-term effects of unemployment on life satisfaction in

unemployed individuals and their partners and thereby providing an answer to the question,

whether and to what extent unemployment affects the life satisfaction of couples.

Partners React to Actors' Unemployment

Our analyses showed that people react to work transitions experienced by their

partners. In comparison to the actors who are directly affected by these events, the changes in

life satisfaction in partners are, on average, less dramatic. One explanation for this differential

effect of unemployment on actors and partners is that some aspects of unemployment affect

both members of the couple whereas other aspects of unemployment have unique effects on

the unemployed actor only (cf. Song et al., 2011). For instance, both partners are affected by

changes in daily routines and shifts in the distribution of household chores as well as by

changes in the economic situation of the household which may in turn compromise

everyone's life satisfaction. On the other hand, many stressors associated with unemployment

might uniquely affect the unemployed actor, for instance, boredom, loss of self-esteem, or

negative experiences during the job search. Hence, because the actor is exposed to both

shared and unique stressors, his or her reaction to unemployment should be stronger than the

reaction of the partner who is only exposed to the shared stressors.

Our data were limited as most of the shared stressors were not measured; however, we

can draw some conclusions about the impact of the sudden loss in income which affects

every member of the household. Previous studies have generally found that the loss of

income accounts for little of the change in life satisfaction of people who become

unemployed (e.g., Lucas et al., 2004). Our results suggest that this is also true for partners.

First, the trajectories described above did not differ substantively between models with and

without household income as a covariate. Second, if changes in income were the central

cause for the observed changes in life satisfaction, we would expect that these effects are

attenuated if the partner has a job; however, we found no evidence for this hypothesis when

we took the partner's labor status into account. On the contrary, the least negative reaction

was observed among those partners were currently unemployed themselves. In sum, the

shared financial situation does not seem to account for the differential changes in life

satisfaction observed in both actors and partners.

   An alternative explanation for the weaker reaction in partners is that unemployment

has no (or a very weak) direct causal effect on life satisfaction in partners but its

consequences are transmitted through the actor. Previous research has detected multiple

pathways through which the actor may influence his or her partner's life satisfaction, for

instance, an increased frequency of marital conflict (Vinokur et al., 1996) or crossover effects

that describe the phenomenon that the stress experienced by one couple member is passed on

to the other couple member (Song et al., 2011; Westman & Vinokur, 1998). But why do these

mediated effects result in a weaker reaction of the partner? First, it is possible that the

partner's reaction is weaker precisely because the effect of unemployment is indirect and

hence partly filtered by the actor. Second, the dynamic processes through which the actor

affects the partner's life satisfaction may not be instantaneous but unfold rather slowly over

time. In this case, the partner's reaction might in fact be much stronger than it appears in the

data but compared to the actor, his or her reaction is delayed (Dew et al., 1987; Liem & Liem,

1988; Penkower et al., 1988; Westman et al., 2004).

   Finally, the partners' life satisfaction might also be influenced by stressors that arise

as a consequence of the actors' job loss but are unique to the partner. For instance, the actors'

job loss may therefore increase the partners' worries about job security which in turn

decrease their life satisfaction. Indeed, it has been found that individuals who were

unemployed in the past report increased worry about job security (Knabe & Rätzel, 2011).

However, we found no evidence that this mechanism also works for partners. In an ancillary

analysis of employed partners, worries about job security did not mediate the link between

unemployment and life satisfaction. It is nevertheless plausible that other stressors unique to

the partner exist, for instance, among employed partners, stress due to increased financial

responsibility.

Trajectories Within Each Time Period

Both before and after the year of job loss, life satisfaction decreased linearly over time

in both actors and partners. The decrease in life satisfaction before unemployment might

reflect anticipatory effects (Clark, Diener, Georgellis, & Lucas, 2008; Luhmann et al., 2013)

and the decrease in life satisfaction during unemployment may reflect the accumulation of

stressors due to long-term unemployment (e.g., Kieselbach, 2003). Alternatively, the decrease

observed in both partners might also be due to factors completely unrelated to changes in

labor status. In fact, a recent study found decreasing life satisfaction in a subsample of

individuals experiencing unemployment as well as in a matched control group (Yap, Anusic,

& Lucas, 2012). These trajectories might reflect normal age-related changes or

instrumentation effects. The former seem unlikely because life satisfaction does not decrease

linearly with age but rather follows a U-shaped distribution over the life span (Blanchflower

& Oswald, 2008; Stone, Schwartz, Broderick, & Deaton, 2010). Instrumentation effects

describes the effect that participants adjust their reports of life satisfaction simply because

they respond to this question repeatedly, not because their life satisfaction has actually

changed. This effect has been observed in the SOEP (Baird, Lucas, & Donnellan, 2010). We

therefore urge to interpret the linear trends found in our study with caution. To disentangle

these various influences on life satisfaction trajectories, future studies should include matched

control groups (for more details on this approach, see Luhmann, Orth, Specht, Kandler, & Lucas, in press).

Individual- and Couple-Level Moderators

We had two competing hypotheses about the role of partner labor status and found evidence for both. Consistent with the financial-stress hypothesis, life satisfaction levels in the first year of unemployment were lowest in those couples where the partner was unemployed as well. Consistent with the shared-fate hypothesis, the reaction to job loss was strongest (i.e., most negative) in those couples where the job loss caused them to be less similar in terms of labor status than before.

The latter finding is consistent with previous work on the importance of social comparison processes in the effects of unemployment on life satisfaction (e.g., Knabe et al., 2012; Clark, 2003). Becoming unemployed is associated with less negative consequences if unemployment is common in the household (as shown in this study) or in the greater community (Clark, 2003), even though the prospects of finding reemployment might be higher in a region with low unemployment rates. This finding suggests that for both the actor and the partner, unemployment hurts primarily because of its psychological consequences rather than because of its immediate financial consequences and the associated worsened long-term prospects on the labor market.

In addition to partner labor status, we examined relationship duration, child status, and the gender of the unemployed person as moderators of life satisfaction trajectories. No moderating effects were found for relationship duration. In line with previous research (Knabe et al., 2012; Lucas et al., 2004), male actors reacted more strongly to unemployment than female actors. However, we did not find a moderating effect of gender among partners. This finding suggests that the partner's reaction to unemployment is primarily caused by shared stressors or within-couple transmission processes that are not specific to one gender.

Finally, we found that couples with children report, on average, lower life satisfaction levels than couples without children in the first year of unemployment. This difference is partially due to a stronger reaction of parents compared to non-parents to unemployment, suggesting that the responsibility associated with having children augments the negative effects of unemployment. In fact, among partners, having children seems to be a primary stressor that accounts for the loss in life satisfaction, as no significant change in life satisfaction was found among childless partners. While parents react more strongly to unemployment, part of the difference in life satisfaction at job loss existed even before the job loss. The literature on the effects of having children on SWB is mixed (e.g., Luhmann, Hofmann, et al., 2012; Nelson, Kushlev, English, Dunn, & Lyubomirsky, 2013), but longitudinal studies show that life satisfaction tends to drop after child birth (Dyrdal & Lucas, 2013), which might explain some of the differences observed here.

Limitations and Future Directions

One limitation of our study is that we were not able to examine the complex intra-couple processes that occur before, during, and after unemployment. This is due to the lack of relevant variables such as communication and coping styles or relationship satisfaction in these data and to the annual-wave design. These processes might unfold over shorter periods of time, and studies with shorter time lags are needed to allow a more fine-grained temporal analysis of the effects of unemployment on the life satisfaction in couples.

Another limitation of our study is that our sample included only cohabitating couples. We do not know whether the effects are similar in couples who do not live together. Moreover, our analyses were restricted to those years when the couple members were together, meaning that couples who separated during the first years after the job loss were excluded. Longitudinal studies have shown that life satisfaction tends to decrease in the years leading up to marital separation and divorce (e.g., Lucas, 2005). Thus, it can be assumed that

the observed effects of job loss on life satisfaction in couples would be even stronger if this group was included. In addition, assuming that at least some of the changes in life satisfaction observed in the partner are due to shared stressors associated with unemployment, it is plausible to assume that other members of the household – particularly children – may also be affected. Finally, even members of the social network not living in the same household, for instance, close friends, former co-workers, and other family members, could experience changes in life satisfaction because of the actor's job loss.

Finally, we need to emphasize that we studied life satisfaction which is related to but conceptually and empirically distinct from other SWB components such as positive and negative affect (Busseri & Sadava, 2011; Luhmann, Hawkley, Eid, & Cacioppo, 2012; Schimmack, Schupp, & Wagner, 2008). In fact, one study found that unemployment is associated with more pronounced changes in life satisfaction than in affective well-being (Knabe, Rätzel, Schöb, & Weimann, 2010). The patterns observed in our study therefore do not necessarily generalize to positive or negative affect nor to other well-being constructs such as purpose in life or self-esteem. Large-scale panel studies such as the SOEP have started to incorporate measures of affective well-being, but to date, the number of available waves is still too low to permit the kinds of complex analyses we performed in the present study. Finally, even though the single-item measure of life satisfaction used in the SOEP is sufficiently reliable, more studies using multi-item measures of life satisfaction should be conducted to allow a better control of measurement error.

Conclusion

Humans are social creatures, yet research on stability and change in SWB has almost exclusively focused on individuals. Our study shows that life satisfaction can change in response to major life events experienced by the partner and possibly also by others in the

social network. To understand the causes of short-term fluctuations and permanent changes in

life satisfaction, the life circumstances of the entire social network need to be considered.

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Appendix

The full level-1 model equation for the dyadic growth curve model with income as a covariate (Model 1) is

$$LS = \quad B_{A0} \cdot INT_A + B_{A1} \cdot PRE\_DUM_A + B_{A2} \cdot PRE\_LIN_A$$

$$+ B_{A3} \cdot POST\_ACTIVE_A + B_{A4} \cdot POST\_INACTIVE_A + B_{A5} \cdot POST\_LIN_A$$

$$+ B_{A6} \cdot POST\_LIN_A \cdot POST\_ACTIVE_A + B_{A7} \cdot POST\_LIN_A \cdot POST\_INACTIVE_A$$

$$+ B_{P0} \cdot INT_P + B_{P1} \cdot PRE\_DUM_P + B_{P2} \cdot PRE\_LIN_P$$

$$+ B_{P3} \cdot POST\_ACTIVE_P + B_{P4} \cdot POST\_INACTIVE_P + B_{P5} \cdot POST\_LIN_P$$

$$+ B_{P6} \cdot POST\_LIN_P \cdot POST\_ACTIVE_P + B_{P7} \cdot POST\_LIN_P \cdot POST\_INACTIVE_P$$

$$+ B_8 \cdot LOG\text{-}INC + E$$

where the outcome LS is the observed life satisfaction score for the corresponding couple member A (actor) or P (partner). The coefficients of the two intercept variables INT_A and INT_P reflect the average level of life satisfaction of actors (B_{A0}) and partners (B_{P0}) in the year of job loss. The two pre-job-loss dummy variables PRE_DUM_A and PRE_DUM_P are coded with 1 in all pre-job-loss and 0 in all subsequent years. The coefficients of these variables reflect the difference in life satisfaction between the year of job loss and the year immediately prior to job loss for actors (B_{A1}) and partners (B_{P1}). The coefficients of the linear change variables PRE_LIN_A and PRE_LIN_P reflect the rate of linear change until the year of job loss for actors (B_{A2}) and partners (B_{P2}).

The variables POST_ACTIVE and POST_INACTIVE are dummy variables coded with 1 in all post-job-loss years when the actors has found reemployment (POST_ACTIVE) or withdrawn from the workforce (POST_INACTIVE) and with 0 in all other years. The

coefficients of these variables reflect the change in life satisfaction as the actor transition into active or inactive labor status, respectively, by actors (B_{A3} and B_{A4}, respectively) and partners (B_{P3} and B_{P4}, respectively). The coefficients of the variables POST_LIN$_A$ and POST_LIN$_P$ reflect the rate of linear change after job loss for actors (B_{A5}) and partners (B_{P5}). Finally, these variables interact with the variables POST_ACTIVE and POST_INACTIVE. The coefficients B_{A6} and B_{P6} reflect the degree to which the rate of linear change in life satisfaction after the transition into active labor status differs from the rate of linear change in life satisfaction after job loss in actors and partners, respectively. Similarly, the coefficients B_{A7} and B_{P7} reflect the degree to which the rate of linear change in life satisfaction after the transition into inactive labor status differs from the rate of linear change in life satisfaction after job loss in actors and partners, respectively. Finally, the coefficient B_8 reflects the association between log-income (LOG-INC) and life satisfaction, and E is the error term.

Following the approach suggested by Bolger and Shrout (2007) and Lauranceau and Bolger (2011), we specified a complex residual error structure of type un@ar(1) available in SAS PROC MIXED. First we modeled separate error variances for the dyad members allowing us to capture distinct residual error variances of the partners and the actors. In addition we modeled the residual error covariance within partners and actors, allowing us to capture a possible covariance in the life satisfaction ratings of partners and actors which are not captured by the models' predictors. Finally we allowed for a residual autocorrelation of lag 1 across the yearly errors within actors and partners, allowing us to model temporal dependencies in the residuals, which are not yet captured by the model.

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Tables

Table 1. Means, standard deviations, and intercorrelations for couple-level variables.

	Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	No. of pre-JL waves	6.17	4.47	--																	
2	No. of JL waves	2.88	2.25	.00	--																
3	No. of post-JL active waves	3.38	4.28	-.18	-.17	--															
4	No. of post-JL inactive waves	2.18	3.76	.02	.09	-.24	--														
5	No. of partner inactive waves	4.07	5.92	.22	.19	-.08	.44	--													
6	No. of partner active waves	9.62	6.76	.35	.06	.40	.05	-.47	--												
7	No. of partner JL waves	0.92	1.97	.03	.18	-.03	.05	.01	-.21	--											
8	Actor LS in last pre-JL year	-0.20	1.79	.00	-.11	.00	.00	-.02	.01	-.13	--										
9	Partner LS in last pre-JL year	-0.20	1.81	.01	-.09	.00	.00	-.03	.06	-.19	.57	--									
10	Actor LS in first JL year	-0.50	1.92	.01	-.09	.02	-.01	-.02	.04	-.11	.52	.40	--								
11	Partner LS in first JL year	-0.31	1.84	.01	-.09	.02	.01	-.04	.08	-.19	.41	.55	.54	--							
12	Actor LS in first active year	-0.29	1.78	-.01	-.11	.03	.01	-.06	.06	-.13	.42	.32	.47	.37	--						
13	Partner LS in first inactive year	-0.24	1.77	-.02	-.12	.01	.02	-.08	.07	-.18	.35	.46	.40	.53	.51	--					
14	Actor LS in first inactive year	-0.47	2.00	.01	-.09	-.01	.09	.04	.01	-.10	.41	.30	.43	.34	.37	.32	--				
15	Partner LS in first inactive year	-0.35	1.85	.02	-.12	-.02	.05	-.04	.08	-.17	.37	.45	.35	.48	.37	.51	.59	--			
16	Actor male gender	0.51	0.50	.06	.03	.00	-.04	.25	-.19	.02	-.02	.00	-.10	-.02	-.09	-.06	-.04	-.03	--		
17	Actor age at job loss	42.96	11.25	.37	.11	-.37	.32	.34	-.08	.04	-.02	-.01	-.06	-.04	-.06	-.06	.02	.02	.18	--	
18	Partner age at job loss	43.13	11.29	.35	.09	-.35	.32	.33	-.09	.04	-.03	-.01	-.02	-.04	-.04	-.07	.02	.01	-.06	.89	--
19	Child status before job loss	0.66	0.47	.20	.00	.14	-.24	-.09	.16	.02	-.05	-.05	-.04	-.06	-.05	-.04	-.09	-.06	-.02	-.29	-.30
20	Relationship duration at job loss	6.17	4.47	1.00	.00	-.18	.02	.22	.35	.03	.00	.01	.01	.01	-.01	-.02	.01	.02	.06	.37	.35
21	Log-income	7.58	0.45	.22	-.15	-.05	-.09	-.12	.18	-.24	.16	.22	.20	.24	.10	.17	.10	.19	-.05	.14	.13

Notes. JL = job loss, LS = life satisfaction. All variables are uncentered except for life satisfaction which is centered on the total sample mean within each wave. Unless otherwise specified, active/inactive refers to active/inactive labor status of actor after the unemployment period. Child status is dummy-coded with 0 = no child under 16 years living in household and 1 = at least one child under 16 years living in household in at least one of the pre-job-loss years. The correlation between number of pre-job-loss years and relationship duration is close to 1 because only those pre-job-loss years when the couples were together were included in the final sample.

Table 2. Variables included in Model 1 and the interpretations of their regression coefficients

Variable name	Description of variable	Interpretation of regression coefficients in Model 1
Intercept	The model contains two intercepts, one for each couple member. Technically, this is achieved by dropping the regular intercept from the model and including two intercept variables (cf. Kenny & Kashy, 2011). The intercept variable for actors is coded with 1 on all measurement occasions of actors and with 0 on all measurement occasions of partners. Similarly, the intercept variable for partners is coded with 1 on all measurement occasions of partners and with 0 on all measurement occasions of actors.	Actors' (Partners') average level of life satisfaction in the first year of unemployment
Pre-JL dummy	Dummy variable coded with 1 on all pre-job-loss occasions and with 0 on all remaining occasions.	Actors' (Partners') average level of life satisfaction in the year prior to unemployment.
Pre-JL linear change	Linear variable counting all years up to the last year before unemployment	Actors' (Partners') average rate of change in life satisfaction from one year to the next in the pre-job-loss period.
Post-JL: active labor status dummy	Dummy variable coded with 1 on all post-JL occasions when the actor is active in the workforce again and with 0 on all other occasions	Change in life satisfaction experienced by actors (partners) in the first year of active labor status
Post-JL: inactive labor status dummy	Dummy variable coded with 1 on all post-JL occasions when the actor is inactive in the workforce and with 0 on all other occasions	Change in life satisfaction experienced by actors (partners) in the first year of inactive labor status

Variable name	Description of variable	Interpretation of regression coefficients in Model 1
Post-JL linear change	Linear variable counting all years starting in the second year of unemployment	Actors' (Partners') average rate of change in life satisfaction from one year to the next in the post-job-loss period
Post-JL linear change × Post-JL: active	Interaction between the post-JL change variable and the post-JL dummy variable reflecting active labor status for the actor	Difference between the rate of linear change in life satisfaction in actors (partners) during unemployment and after the beginning of active labor status
Post-JL linear change × Post-JL: inactive	Interaction between the post-JL change variable and the post-JL dummy variable reflecting inactive labor status for the actor	Difference between the rate of linear change in life satisfaction in actors (partners) during unemployment and after the beginning of inactive labor status

Notes. All variables are entered into the model twice; once for the actor and once for the partner. JL = job loss.

Table 3. Unstandardized regression coefficients for Model 1.

Variable	B	SE	t	p
Actor				
Intercept B_{A0}	-0.56	0.03	-18.08	$< .001$
Pre-JL dummy B_{A1}	0.41	0.03	14.02	$< .001$
Pre-JL linear change B_{A2}	-0.04	0.00	-11.03	$< .001$
Post-JL: active labor status dummy B_{A3}	0.33	0.04	9.18	$< .001$
Post-JL: inactive labor status dummy B_{A4}	0.18	0.05	3.88	$< .001$
Post-JL linear change B_{A5}	-0.05	0.01	-9.71	$< .001$
Post-JL linear change $\times$ Post-JL: active B_{A6}	0.03	0.01	4.95	$< .001$
Post-JL linear change $\times$ Post-JL: inactive B_{A7}	0.04	0.01	5.84	$< .001$
Partner				
Intercept B_{P0}	-0.32	0.03	-10.51	$< .001$
Pre-JL dummy B_{P1}	0.15	0.03	5.26	$< .001$
Pre-JL linear change B_{P2}	-0.04	0.00	-11.54	$< .001$
Post-JL: active labor status dummy B_{P3}	0.10	0.03	3.00	.003
Post-JL: inactive labor status dummy B_{P4}	0.12	0.04	2.59	.010
Post-JL linear change B_{P5}	-0.04	0.01	-7.02	$< .001$
Post-JL linear change $\times$ Post-JL: active B_{P6}	0.01	0.01	1.61	.108
Post-JL linear change $\times$ Post-JL: inactive B_{P7}	0.01	0.01	2.13	.033
Log-income B_8	0.53	0.02	23.45	$< .001$

Notes. JL = job loss. *Pre-JL dummy* is coded with 1 on all pre-job-loss occasions and with 0 on all other occasions. *Post-JL: active labor status dummy* and *Post-JL: inactive labor status dummy* are coded with 1 on all post-job-loss occasions where the actor is active/inactive in the workforce, respectively, and with 0 on all other occasions. *Pre-JL linear change* reflects linear change up during the pre-job-loss period. *Post-JL linear change* reflects linear change in life satisfaction during the post-job-loss period. *Income* is logarithmized and centered on the couple-level mean.

Table 4. Unstandardized regression coefficients for Model 2.

Variable	B	SE	t	p
Actor				
Intercept B_{A0}	-0.49	0.04	-12.79	< .001
Pre-JL dummy B_{A1}	0.34	0.04	7.62	< .001
Pre-JL linear change B_{A2}	-0.04	0.00	-10.60	< .001
Post-JL: active labor status dummy B_{A3}	0.33	0.04	9.32	< .001
Post-JL: inactive labor status dummy B_{A4}	0.17	0.05	3.77	< .001
Post-JL linear change B_{A5}	-0.05	0.01	-9.71	< .001
Post-JL linear change × Post-JL: active B_{A6}	0.03	0.01	5.03	< .001
Post-JL linear change × Post-JL: inactive B_{A7}	0.04	0.01	5.51	< .001
Partner unemployed dummy B_{A8}	-0.27	0.05	-5.82	< .001
Partner active labor status dummy B_{A9}	-0.07	0.03	-2.25	.025
Pre-JL dummy × Partner unemployed dummy B_{A10}	0.04	0.07	0.52	.600
Pre-JL dummy × Partner active labor status dummy B_{A11}	0.10	0.04	2.21	.027
Partner				
Intercept B_{P0}	-0.41	0.04	-10.70	< .001
Pre-JL dummy B_{P1}	0.19	0.04	4.24	< .001
Pre-JL linear change B_{P2}	-0.04	0.00	-10.83	< .001
Post-JL: active labor status dummy B_{P3}	0.09	0.03	2.65	.008
Post-JL: inactive labor status dummy B_{P4}	0.11	0.04	2.49	.013
Post-JL linear change B_{P5}	-0.04	0.01	-6.66	< .001
Post-JL linear change × Post-JL: active B_{P6}	0.01	0.01	1.45	.146
Post-JL linear change × Post-JL: inactive B_{P7}	0.02	0.01	2.21	.027
Partner unemployed dummy B_{P8}	-0.44	0.05	-9.60	< .001
Partner active labor status dummy B_{P9}	0.18	0.03	5.82	< .001
Pre-JL dummy × Partner unemployed dummy B_{P10}	-0.17	0.07	-2.43	.015
Pre-JL dummy × Partner active labor status dummy B_{P11}	-0.05	0.04	-1.15	.251
Log-income B_{12}	0.48	0.02	21.08	< .001

Notes. JL = job loss. *Pre-JL dummy* is coded with 1 on all pre-job-loss occasions and with 0 on all other occasions. *Post-JL: active labor status dummy* and *Post-JL: inactive labor status dummy* are coded with 1 on all post-job-loss occasions where the actor is active/inactive in the workforce, respectively, and with 0 on all other occasions. *Partner unemployed dummy* and *partner active labor status dummy* are coded with 1 on all occasions when the partner is unemployed/active in the workforce, respectively, and with 0 on all other occasions. *Pre-JL linear change* reflects linear change up during the pre-job-loss period. *Post-JL linear change* reflects linear change in life satisfaction during the post-job-loss period. *Income* is logarithmized and centered on the couple-level mean.

Table 5. Unstandardized regression coefficients for Model 3.

Variable	B	SE	t	p
Actor Level-1 Variables				
Intercept B_{A0}	-0.50	0.06	-9.08	< .001
Pre-JL dummy B_{A1}	0.43	0.05	8.92	< .001
Pre-JL linear change B_{A2}	-0.04	0.00	-10.61	< .001
Post-JL: active labor status dummy B_{A3}	0.41	0.03	15.05	< .001
Post-JL: inactive labor status dummy B_{A4}	0.32	0.03	9.89	< .001
Post-JL linear change B_{A5}	-0.03	0.00	-8.77	< .001
Partner Level-1 Variables				
Intercept B_{P0}	-0.14	0.06	-2.50	.013
Pre-JL dummy B_{P1}	0.05	0.05	1.16	.245
Pre-JL linear change B_{P2}	-0.04	0.00	-10.95	< .001
Post-JL: active labor status dummy B_{P3}	0.13	0.03	4.79	< .001
Post-JL: inactive labor status dummy B_{P4}	0.17	0.03	5.28	< .001
Post-JL linear change B_{P5}	-0.03	0.00	-10.08	< .001
Actor Level-2 Variables				
Children B_{A6}	-0.34	0.06	-5.80	< .001
Pre-JL dummy × Children B_{A7}	0.14	0.05	2.89	.004
Relationship duration B_{A8}	0.013	0.01	2.07	.039
Pre-JL dummy × Relationship duration B_{A9}	-0.01	0.01	-1.86	.062
Female B_{A10}	0.24	0.05	4.62	< .001
Pre-JL dummy × Female B_{A11}	-0.13	0.05	-2.85	.004
Partner Level-2 Variables				
Children B_{P6}	-0.35	0.06	-5.86	< .001
Pre-JL dummy × Children B_{P7}	0.17	0.05	3.63	< .001
Relationship duration B_{P8}	0.006	0.01	0.94	.345
Pre-JL dummy × Relationship duration B_{P9}	-0.01	0.01	-0.99	.324
Female B_{P10}	0.06	0.05	1.14	.252
Pre-JL dummy × Female B_{P11}	-0.01	0.04	-0.23	.820
Actor age at job loss B_{12}	-0.01	0.00	-4.16	< .001
Log-income B_{13}	0.54	0.03	23.78	< .001

Notes. JL = job loss. *Pre-JL dummy* is coded with 1 on all pre-job-loss occasions and with 0 on all other occasions. *Post-JL: active labor status dummy* and *Post-JL: inactive labor status dummy* are coded with 1 on all post-job-loss occasions where the actor is active/inactive in the workforce, respectively, and with 0 on all other occasions. *Pre-JL linear change* reflects linear change up during the pre-job-loss period. *Post-JL linear change* reflects linear change in life satisfaction during the post-job-loss period. *Income* is logarithmized and centered on the couple-level mean. *Children* is dummy-coded with 0 = no children in the year of job loss and 1 = at least one child under 16 living in the household in year of job loss. *Female* is dummy-coded with 0 = male and 1 = female. *Relationship duration* and *actor age* are centered on the grand mean.
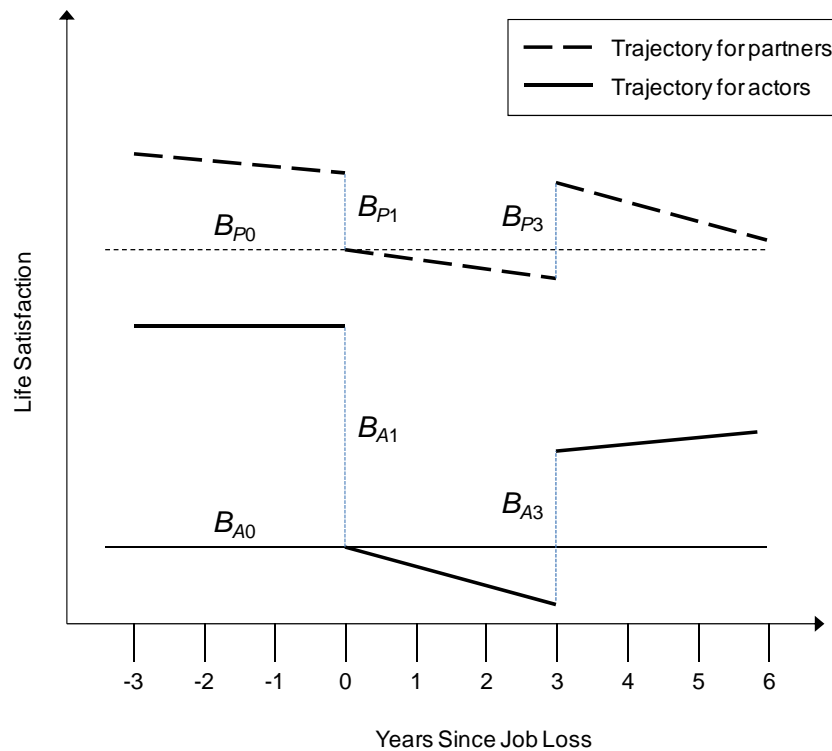
Figures

Figure 1. A fictional trajectory illustrating the interpretation of the key model parameters. The coefficients B_{A0} and B_{P0} reflect the level of life satisfaction at job loss for actors (solid horizontal line) and partners (dashed horizontal line), respectively. B_{A1} and B_{P1} are the coefficients of the pre-job-loss dummy variables and reflect the difference in life satisfaction between the year before job loss and the year of job loss for actors and partners, respectively. B_{A3} and B_{P3} are the coefficients of the active labor status dummy variable and reflect the change in life satisfaction experienced in the year when the actors finds reemployment for actors and partners, respectively. For the interpretation of the other variables and their coefficients, see Table 2. The full model equation is reported in the appendix.
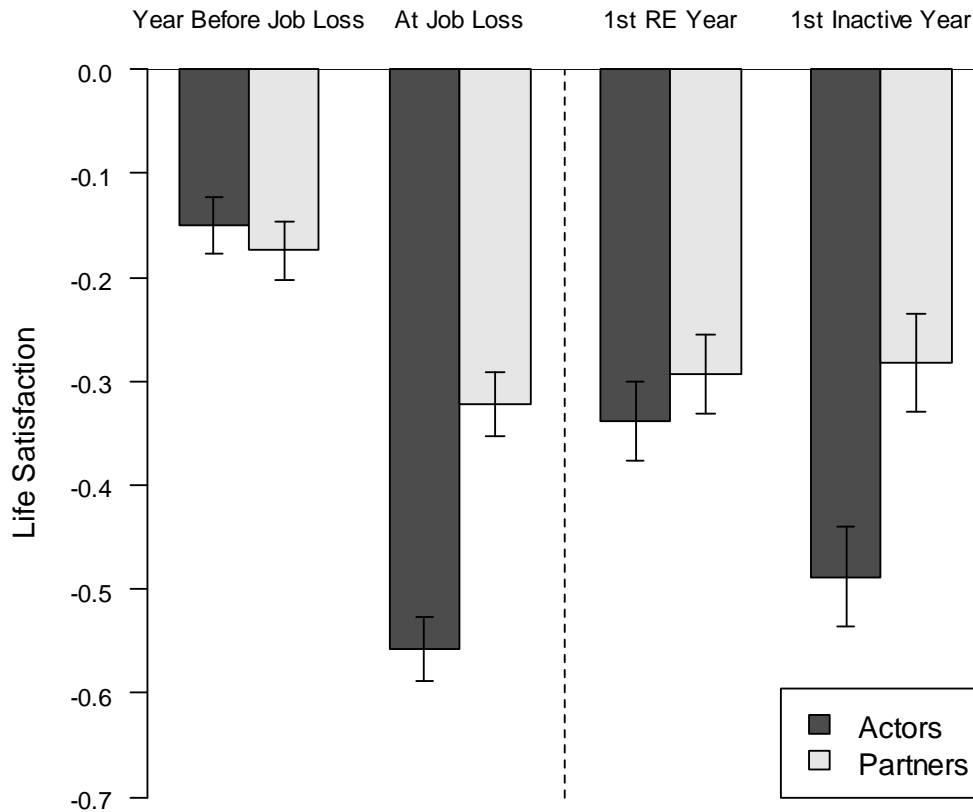
Figure 2. Predicted levels of life satisfaction in actors and partners in the year before job loss, in the year of job loss, in the first year of reemployment/active labor status (RE), and in the first inactive year. For the latter two, two years of linear decreases in life satisfaction were included in the estimation of the predicted levels of life satisfaction. Error bars depict standard errors. A life satisfaction value of 0 corresponds to the average level of life satisfaction in all SOEP participants who are representative of the German population.
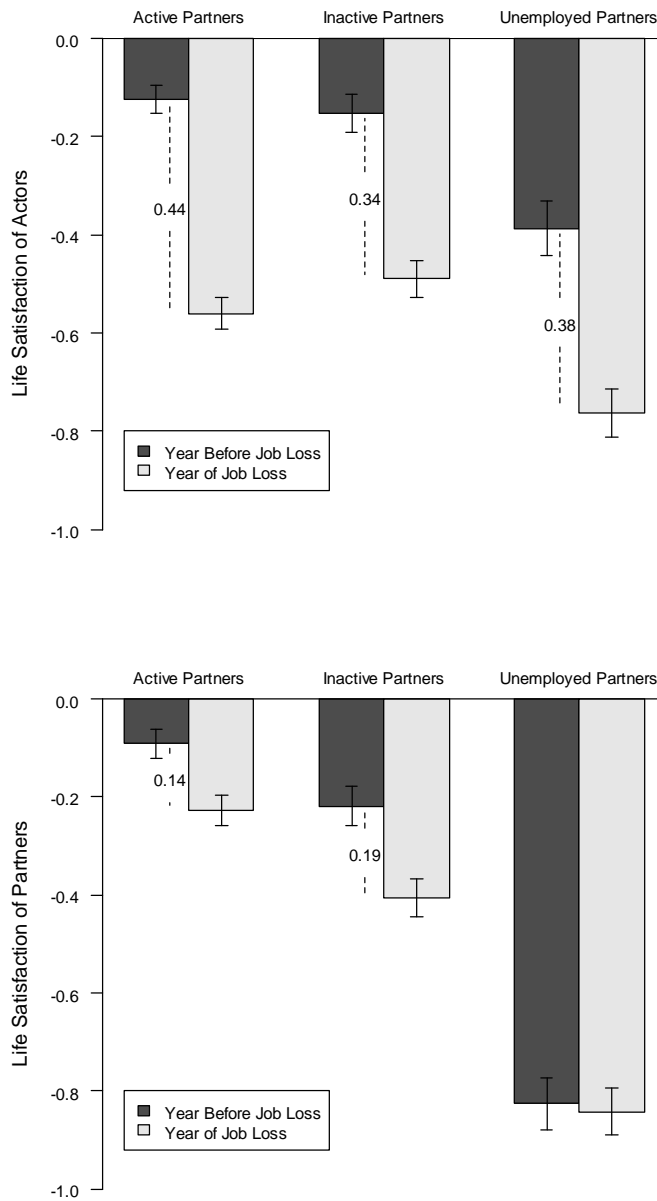
Figure 3. Predicted life satisfaction levels in actors (top panel) and partners (bottom

level) in the last year before job loss year and the year when the job loss occurred with

partners who are active, inactive, or unemployed at the time of the job loss. The printed

values represent the difference between the two time points within each group. For

unemployed partners, this difference was 0.02 points.