Your Spouse Is Fired! How Much Do You Care?

Milena Nikolova
Sinem Ayhan

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Milena Nikolova
IZA and Brookings

Sinem Ayhan
IZA

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ABSTRACT

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This study is the first to provide a causal estimate of the subjective well-being effects of spousal unemployment at the couple level. Using German panel data on married and cohabiting partners for 1991-2013 and information on exogenous job termination induced by workplace closure, we show that spousal unemployment reduces the life satisfaction of indirectly-affected spouses. The impact is equally pronounced among female and male partners. Importantly, the results are not driven by an income effect, but likely reflect the psychological costs of unemployment. Our findings are robust to a battery of sensitivity checks and imply that public policy programs aimed at mitigating the negative consequences of unemployment need to consider within-couple spillovers.

Corresponding author:
Milena Nikolova
IZA
Schaumburg-Lippe-Str. 5-9
53113 Bonn
Germany
E-mail: nikolova@iza.org

1. Introduction

Labor economists are devoting increasing attention to the broad well-being consequences of unemployment. Beyond the associated income decline and worsened labor market prospects, unemployment causes unhappiness, which permanently scars people. [1,2] Moreover, while unemployment worsens the well-being of those directly affected, it could also impact others in the household through a "domino effect" (Kind & Haisken-DeNew, 2012). It is reasonable to expect that one spouse's job loss affects the other partner through the increased financial strain, the change in the amount of time spent (together) at home or the spillover of negative emotions such as worry and sadness. However, with a few exceptions, the large body of literature on unemployment and well-being has surprisingly ignored these within-couple subjective well-being (SWB) externalities to date. To our knowledge, we are the first to investigate how one spouse's involuntary unemployment causally affects the SWB of the other partner (i.e. indirectly-affected spouse). [3] In addition to controlling for time-invariant unobserved

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[1] Several cross-sectional and panel data studies document a robust negative relationship between unemployment and perceived well-being (Clark, 2016; Clark & Oswald, 1994; Winkelmann & Winkelmann, 1998). Kassenboehmer and Haisken-DeNew (2009) show that the relationship is causal. Furthermore, past unemployment experiences reduce the SWB of those currently employed (Clark, Georgellis, & Sanfey, 2001). Furthermore, panel data analyses from Germany, Russia, Korea and Australia concur that men do not adapt to unemployment, with two studies finding partial adaptation (see Clark (2016) for a literature review). The results for women are not so clear-cut.

[2] The term subjective well-being (SWB) - which refers to positive and negative emotions (i.e. hedonic well-being), life evaluation (i.e. evaluative well-being), and life purpose assessments (i.e. eudaimonic well-being) - is increasingly used to evaluate the non-pecuniary costs of unemployment. In surveys, positive hedonic well-being is usually measured by asking respondents whether they experienced a lot of positive emotions such as happiness, joy or smiling the day before and negative emotions such as stress, anger, or worry the day before. Life evaluations are usually captured via overall life satisfaction questions. Eudaimonic well-being - the least well-understood SWB dimension - can be measured using questions related to meaning and purpose in life. Nevertheless, a consensus on these SWB dimensions has only emerged in the last five years (OECD, 2011). As such, past studies somewhat incorrectly use "happiness" and "life satisfaction" interchangeably. In this paper, we focus on the cognitive SWB dimension, namely life satisfaction. For further distinctions among the SWB dimensions and more information about their determinants, see Graham and Nikolova (2015); Helliwell, Huang, and Wang (2016); Tay and Diener (2011).

[3] Throughout this paper, we use the terms "spouse" and "partner" interchangeably. "Husband" is a heuristic used to designate the male partner, while "wife" denotes the female spouse. Cohabiting couples do not need to be formally married.

heterogeneity using individual fixed effects, we exploit information on the partner's job termination due to plant closure as an exogenous unemployment shock.[4]

We build on the modest literature on the broad well-being consequences of unemployment for indirectly-affected spouses (Bubonya, Cobb-Clark, & Wooden, 2014; Marcus, 2013; Mendolia, 2014; Whelan, 1994). Specifically, using panel data from the German Socio-Economic Panel Study (GSOEP) for 1991-2013, we find that spousal job loss due to company closure has a negative effect on the indirectly-affected spouse's life satisfaction.[5] In particular, a husband's life satisfaction decreases by about 0.3 points (on a scale of 0-10) following his wife's unemployment. The decline is slightly larger (0.4) for the average woman whose husband loses his job, although the gender difference is statistically insignificant. The life evaluations reduction is also mirrored in the declining satisfaction with household income and living standards but not in other life domains. In line with previous work (Bubonya et al., 2014; Mendolia, 2014), we find that the negative effects of spousal unemployment are not driven by an income effect. Our results are robust to several sensitivity tests controlling for the job loss expectation, panel attrition, partnership dissolution, the unemployment duration, future income and state-specific shocks.

Our findings highlight the importance of unemployment's within-couple externalities and expand the state-of-the-art knowledge of such interdependencies. As such, the results imply that effective public policy programs aimed at mitigating the negative consequences of unemployment should adopt a family perspective.

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[4] Using plant closures as a proxy for involuntary job loss is relatively well established in the literature. For a list of studies that exploit the plant closure variable, see footnote 7 in Chadi and Hetschko (2016).

[5] Throughout this paper, we use the terms "plant closure" and "company/workplace closure" interchangeably. Furthermore, we use the terms "unemployment" and "job loss" interchangeably.

2. Related Literature

A large body of literature focuses on the *individual* SWB and mental health consequences of job loss. Both cross-sectional and panel studies demonstrate the high well-being cost of unemployment. Using the only cross-section from the British Household Panel Study (BHPS) available at the time, Clark and Oswald (1994) were among the first to document the negative association between personal unemployment and mental health. Furthermore, Gerlach and Stephan (1996) and Winkelmann and Winkelmann (1998) furnish the first panel regression estimates demonstrating the negative life satisfaction consequences of unemployment in Germany. Individual unemployment reduces life satisfaction by about 1 point on a scale of 0-10 (Kassenboehmer & Haisken‐DeNew, 2009). Winkelmann and Winkelmann (1998) also demonstrate that the pecuniary costs associated with unemployment (i.e. the loss of income) are smaller compared to the non-monetary costs related to loss of status and work identity. Given the large non-monetary costs of job loss, the literature concluded that unemployment entry is largely involuntary. Importantly, Kassenboehmer and Haisken-DeNew (2009) are the first to distinguish between voluntary and involuntary job loss, finding that compared with regular unemployment, company closures – which proxy exogenous job loss – are particularly detrimental for women in West Germany. [6] Moreover, even job loss expectations can be as devastating as the unemployment experience itself (Witte, 1999). Importantly, men do not adapt to unemployment

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[6] In addition to the lack of panel data, a major challenge in providing causal estimates is the endogeneity related to self-selection into unemployment. In this context, even panel regressions estimates that account for time-variant unobserved heterogeneity cannot be treated as causal unless they rely on an exogenous variation in unemployment. It is likely that unhappy workers would voluntarily quit their jobs and including person fixed effects does not resolve the reverse causality issue.

in virtually every context in which this relationship has been investigated: even five years after becoming unemployment, (male) life satisfaction scores continue to decline (Clark, 2016).[7]

In short, the literature shows unequivocal well-being losses from unemployment accruing to those directly affected by it. Nevertheless, few studies have examined how *spousal* unemployment affects the other partner, while among those that do the majority focus on mental health rather than life satisfaction. One of the first nationally representative analyses offering a household-level perspective on unemployment uses 1987 Irish data to demonstrate that husbands' unemployment is unassociated with wives' mental health (Whelan, 1994). In addition, using the GSOEP for West Germany, Winkelmann and Winkelmann (1995) find that partners' unemployment does not change men's SWB, while women experience a 0.5-point drop in life satisfaction (on a scale of 0-10) if their partners become unemployed. However, the study does not distinguish between voluntary and involuntary job loss.

To our knowledge, only five studies use panel data regressions to investigate the mental health consequences of spousal unemployment (Bubonya et al., 2014; Clark, 2003; Marcus, 2013; Mendolia, 2014; Siegel, Bradley, Gallo, & Kasl, 2003).[8] Exploiting British panel data, Clark (2003) discovers that the negative mental well-being consequences of unemployment are partially mitigated if the spouse or other household members are also unemployed, highlighting the social norm of unemployment.[9] Using panel data on older adults from the Health and

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[7] In this sense, personal unemployment is unlike any other life event. People's life satisfaction normalizes (although it may not fully recover to its initial level) after income gains and losses, marriage, divorce, birth of a child, widowhood and disability (Clark, 2016).

[8] Several studies examine the well-being consequences of parental unemployment for co-resident children. First, using British longitudinal data, Powdthavee and Vernoit (2013) find that parental unemployment was positive for children's happiness when the child was up to 11 years old but the effect becomes negative or significant later on. Using data on German adolescent children, Kind and Haisken-DeNew (2012) show that the life satisfaction of male children aged 17-25 declines following their father's unemployment. Meanwhile, Bubonya et al. (2014) find that parental unemployment only worsens female children's mental health.

[9] The social norm of unemployment relates to the finding that aggregate unemployment levels are generally negatively associated with the well-being of the employed but have a smaller effect on the unemployed (Clark,

Retirement Study, Siegel et al. (2003) find no association between husbands' job loss and wives' mental health, which is consistent with the cross-sectional results of Whelan (1994). Nevertheless, neither of these papers convincingly addresses the endogeneity of unemployment (i.e. the possibility that the wife's mental health issues prompted the husband's dismissal), which limits the causal interpretation of their findings.

To our knowledge, only a handful of papers explicitly tackle the endogeneity between spousal job loss and the other partner's mental health outcomes. Specifically, based on 2002-2010 German panel data and a difference-in-differences matching estimator, Marcus (2013) finds that unemployment negatively affects own mental health as well as the mental health of the other spouse, with the latter effect being smaller. His results further suggest that the decreases in spousal mental health are larger when the husband (rather than the wife) becomes jobless. Mendolia (2014) deals with the possible endogeneity of job loss by focusing on redundancies in declining industries. Using a logit fixed effects model and the first fourteen waves of BHPS, she finds that British couples in which the man loses a job experience poor mental health. Bubonya, et al. (2014) utilize Australian panel data and mitigate reverse causality problems by relying on a fixed effects analysis in combination with lagged spousal unemployment. They demonstrate that husbands' mental health does not deteriorate due to their wives' job loss. However, the mental well-being of wives declines after their husbands' unemployment but only if the couple had financial difficulties prior to the unemployment. The authors also document a negative effect of parental unemployment for co-resident adolescent female children. Building on these studies, we

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Knabe, & Ratzel, 2010). This finding is confirmed using data from countries such as United Kingdom, Australia, South Africa, Germany, and Switzerland (Clark, Knabe, & Rätzel, 2009; Powdthavee, 2007; Shields & Price, 2005; Shields, Price, & Wooden, 2009; Stutzer & Lalive, 2004). Eggers, Gaddy and Graham (2006) further demonstrate that an increase in the local unemployment rate has a small positive effect on individual life satisfaction in Russia, likely because when peers are doing badly in adverse economic times they lower their standards and expectations.

are interested in the causal effects of spousal unemployment on the other partner's life evaluations.

3. Data and Variables

3.1. Data

Our analyses are based on the German Socio-Economic Panel (GSOEP), which is a representative household panel in Germany. The data offer a rich set of variables related to subjective well-being, personality, health, labor market characteristics, income, household composition and finances, as well as family biography. The main dependent variable is the overall life satisfaction measured on a scale of 0 (completely dissatisfied) to 10 (completely satisfied). In separate regressions, we include variables capturing satisfaction with different life domains such as leisure time, housework, income, standard of living, and health, all of which are measured on a scale of 0 to 10 (see Table 1 for variable definitions). The satisfaction with housework is only asked to those respondents who work in the household.

The GSOEP includes a variable reporting all types of labor force status since the last interview, including private employment, civil service, self-employment, apprenticeship/traineeship, registered unemployment, retirement and being in education. In addition – and importantly for our identification strategy – starting in 1985 the GSOEP introduced a question on the reasons for job termination and since 1991 the answers have included a category for "place of work closed," which allows distinguishing between voluntary and involuntary unemployment (Kassenboehmer & Haisken‑DeNew, 2009). We exploit this information to construct an indicator for exogenous unemployment. However, note that in 1999 and 2000 the answer categories excluded company closure, which is why we exclude these two years from our analysis.

Our analysis also utilizes the information on respondents' demographic and labor market characteristics such as age, sex, education, health, marital and labor force status, future expectations about employment status, working hours, as well as household characteristics such as number of children, household size, household income, home ownership and place of residence. Table 1 describes the variables used in the analysis.

3.2. Analysis Sample

Our analysis sample comprises cohabiting couples – regardless of their formal marital status – matched based on spouse and household identifiers. The directly affected spouses defined as those who potentially experience unemployment due to plant closure are full- or part-time private employees at time *t-1*. The "private employee" category excludes pensioners, civil servants, self-employed and those in military/community service and education. Some spouses continue to be private employees at time *t,* while others become registered unemployed and experienced unemployment due to plant closure.[10] To capture the working-age population, we restrict the ages of the directly affected spouses as being between 18 and 67, while the indirectly-affected spouses can be of any age and employment status. We exclude couples in which both the husband and wife simultaneously experienced job loss due to plant closure.

Our "husband" analysis sample comprises 44,603 couple-years, or 8,333 couples, among which 205 wives experience job loss due to plant closure. In the "wife" sample (i.e. where the husband potentially experiences involuntary and unexpected job loss), we have 52,598 couple-years, or 9,043 couples, among which 262 husbands lose their jobs due to plant closures.

Table 2 furnishes statistics regarding the main characteristics of the indirectly-affected spouses by gender. In Table 3, we further compare the observable characteristics of spouses

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[10] Because the panel is conducted once a year, the job loss due to plant closure could have occurred any time in the past 12 months.

whose partner lost their job due to a plant closure with those whose partners are registered unemployed for any reason. The table suggests that husbands whose wives experienced plant closure are not fundamentally different from husbands with unemployed wives. There are some statistically significant differences between the wives of those who lost their jobs due to company closure and the wives of other unemployed husbands, which we acknowledge but cannot directly address.

4. Empirical Specification

The life satisfaction Y of the indirectly-affected spouse i living in observed time period t can be specified as:

$$Y_{it} = \alpha + \beta\, U^{S}_{it} + X'_{it}\, \Omega + \gamma_i + \tau_t + \varepsilon_{it} \tag{1}$$

In this setup, the unit of observation is the couple-year, U^S is a binary indicator for spousal job loss due to plant closure. The well-being consequences of spousal unemployment are identified by couples in which one partner changes their labor force status from being a private employee to being registered unemployed due to a plant closure. Technically speaking, the binary variable U^S in the "wife" sample takes the value of 1 if the husband changes his labor force status from being a private employee to being registered unemployed due to a plant closure, and 0 if he stays in private employment. Similarly, in the "husband" sample the binary variable (U^S) is defined with respect to the wife's employment status. Furthermore, X is a vector denoting the indirectly-affected spouse's individual-level characteristics (age, age squared, years of schooling, labor force status, annual work hours and disability status) as well as a vector of household-level controls (including the number of children, household size, home ownership,

(log of) total disposable household income, indicator for west/east of Germany and federal state), γ and τ are individual and year fixed effects, respectively, and ε is the stochastic error term.[11]

We would like to point out that the income variable may be endogenous with spousal employment status: unemployment reduces household income, which in turn lowers life satisfaction. However, excluding income from the regressions altogether changes the interpretation of the U^S coefficient estimate. Specifically, when we control for income, β represents the non-pecuniary "costs" of spousal unemployment, i.e. the costs above and beyond income (Winkelmann & Winkelmann, 1998). That said, it is unclear what the correct specification of the income variable that is included in the regressions should be. Ideally, we would like to have an income variable that is unaffected by spousal unemployment, although such a variable is difficult to find. In different specifications, we control for household income from asset flows (savings, dividends and rents) and disposable household income. We also offer regressions excluding income. Given that the results do not change much, our preferred specification is the one controlling for household income, which is conventional in literature on happiness and unemployment.

Because life satisfaction is an ordinal variable measured on a scale of 0-10, we should technically estimate equation (1) using an ordinal logit or probit regression. Since ignoring the ordinality of the data holds little consequence for the end result (Ferrer-i-Carbonell & Frijters, 2004; Frijters & Beatton, 2012), SWB regressions are commonly estimated using ordinary least squares (OLS). We estimate equation (1) through a linear regression model using individual fixed effects, which control for time-invariant unmeasurable and unobservable traits that can be

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[11] As explained in Section 3.2, to construct cohabiting couples, we match partners using spouse and household identifiers. Each individual is thus representative of the couple and individual fixed effects are also couple fixed effects. As such, the fixed effects capture selection issues associated with household formation such as assortative mating.

correlated with both the independent variables and the SWB outcome. The fixed effects regressions and the fact that company closures are exogenous to spousal life satisfaction allow for the causal interpretation of our estimates.

5. Main Results

Table 4 presents the well-being consequences of involuntary unemployment for the indirectly-affected spouses.[12] All regressions include individual (i.e. couple) fixed effects and controls for the year of survey and state of residence. The left panel of the table (columns (1)-(3)) reports the results for men whose (female) partners are dismissed due to plant closure. On the other hand, the right panel (columns (4)-(6)) reports the women's life satisfaction response to their spouses' job loss. Models (1) and (4) do not control for income, Models (2) and (5) include a variable for household income from asset flows, while Models (3) and (6) control for total disposable household income. In subsequent regressions, we only show the results controlling for household income.

The estimates presented in Table 4 unequivocally demonstrate that regardless of gender, spousal job loss due to company closure negatively influences the life satisfaction of the indirectly-affected partner. Men's life satisfaction declines by about 0.3 points as a result of their wives' unemployment. The effect is slightly more pronounced among women whose spouses become jobless, amounting to a reduction in perceived well-being of almost 0.4 points. The

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[12] Regressions for the sample of cohabiting couples showing the effects of own unemployment on own life satisfaction are shown in Table A1. Columns (1)-(3) of Table A1 present the results for men (who themselves get unemployed due to plant closure), while columns (4)-(6) demonstrate the findings for women (who themselves get unemployed due to plant closure). The main takeaway from this table is that men's negative well-being response to own unemployment is stronger than that for females. Based on our preferred specification controlling for household income, job loss decreases men's life evaluations by 1.02 points, while the corresponding drop is 0.79 points for women. This finding is in line with Grogan and Koka (2013) who show that if men face stigma in home production, they experience larger declines in life satisfaction when become unemployed compared to women who become jobless. When jobless, women tend to substitute market work with household work. In addition, men's social networks will be drawn from their work colleagues and job loss would mean the loss of peers. By contrast, women have non-work social contacts from their children or grocery shopping, which may mitigate the non-pecuniary costs of unemployment (Grogan & Koka, 2013).

results are robust to excluding income and controlling for household income from asset flows. These estimates suggest that the psychological costs of unemployment are high and borne not only by those directly experiencing unemployment but also by their partners. The fact that the results do not change once we exclude income implies that the life satisfaction penalty from spousal unemployment is due to psychological distress and the non-pecuniary costs of unemployment rather than being due to income.

In a next step, we quantify how much spouses care about their partners' job loss. Using the life satisfaction valuation approach (Clark & Oswald, 2002; OECD, 2013), we calculate the amount of household income required to compensate the indirectly-affected spouse for the life satisfaction penalty resulting from their partner's job loss. Based on the sample mean of household income of 41,300 Euro, male partners need to be given about 37,300 Euros. For indirectly-affected women, the corresponding compensation equals 60,300 Euros.[13]

The coefficient estimates of the control variables are generally in line with the economic theory and previous studies. For instance, a higher educational attainment is positively correlated with the indirectly-affected spouse's own life satisfaction. Likewise, home ownership – which is a proxy for wealth – and household income are positively associated with own life satisfaction. Like other studies using the GSOEP (Kassenboehmer & Haisken-DeNew, 2012; Ulloa, Møller, & Sousa-Poza, 2013), we do not find the typical U-shaped relationship between life satisfaction and age in fixed effects estimation. Finally, disability status is negatively associated with life satisfaction. In addition, while the signs of the coefficient estimates for the control variables are

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[13] Following the most common methodology, we calculated the compensations by dividing the coefficient estimates for spousal unemployment by the household income coefficient and then multiplying by the average household income in the sample. For male partners, based on the coefficient estimate in Table 4, the corresponding valuation is given by dividing the job loss coefficient of -0.332 by the income coefficient of 0.368 and then multiplying by the average household income in the sample of 41,300. The compensating valuation for female partners is higher than that for males because the coefficient estimate for income (0.271) is relatively smaller compared to that for spousal job loss (-0.396).

generally the same across genders, those for own unemployment have a substantially larger negative effect on men compared with women (based on the coefficient estimate for *registered unemployed*).[14]

In Table 5, we further explore whether spousal unemployment affects satisfaction with housework, free time, household income, living standards and health. Like the life evaluations variable, the regressands in Table 5 are subjective assessments of the different life aspects and are measured on a scale of 0-10. This table's main insight is that spousal job loss due to company closure reduces the other partner's satisfaction with household income and satisfaction with living standards but affects no other life domains. These results suggest that both genders experience a deterioration in their household's *perceived* financial well-being but not in terms of other life aspects.

6. Robustness Checks

In this section, we explore whether our results are robust to a battery of sensitivity checks. Our first check concerns the exogeneity of the treatment variable. Like Kassenboehmer and Haisken-DeNew (2009), we argue that plant closures are exogenous from the perspective of the individual respondent or their spouse. Nevertheless, those who remain at the firm until the very end may have had reasons for doing so despite knowing about the looming closure. As Kassenboehmer and Haisken-DeNew (2009) argue, if a company takes a few months or years to close down, then only the least flexible employees would remain until the end, thus implying that the estimated effects represent an upper bound of the actual average effect of spousal unemployment on well-being. To ensure that the plant closure experience was indeed exogenous, Table 6 furnishes results controlling for the directly affected spouse's unemployment

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[14] As noted, in Table A1 we also show the effects of own job loss due to plant closure on own life satisfaction. Due to the different analysis samples (directly vs. indirectly affected spouses), we cannot compare the effects of own unemployment to those of spousal unemployment, a point also made by Marcus (2013).

expectations (see Table 1 for variable definition). In separate specifications (columns (2) and (4)), we also code all missing values for this variable as "no response" and include them in the regressions. This coding helps to avoid losing observations when we construct the lagged variable of job loss expectation and because this question was asked every other year. The coefficient estimates of the key regressor reported in Table 6 are similar to those discussed in Table 4, suggesting that our treatment variable is exogenous. The coefficient estimate (-0.26) for spousal job loss is smaller in magnitude and marginally statistically significant compared with the main results (-0.33) in the male partner sample, while it is larger in magnitude and statistically significant in the wife sample.

Second, given the panel structure of our data, attrition – or the non-random exit of spouses from the dataset for reasons correlated with the unemployment episode – is a potential concern. To understand whether it biases the estimates, we constructed a binary indicator taking the value of one if the indirectly-affected spouse disappears from the sample in the next time period. In Table 7, Models (1) and (3), we show that controlling for sample attrition does not influence the results. In addition, in Table A2 we also show the main regressions applying the sample weight, which partially addresses the issue of the sample selectivity and the changing willingness to participate in surveys. However, note that the number of observations in Table A2 is smaller than that in Table 4 as some individuals are assigned 0 weights (Haisken-DeNew & Frick, 2005). The coefficient estimates in Table A2 are slightly higher but generally similar to those presented in Table 4.

A related issue arises from the fact that partners may drop from the sample due to divorce or separation, which could be partly induced by the job loss episode (Doiron & Mendolia, 2012; Eliason, 2012; Hansen, 2005; Rege, Telle, & Votruba, 2007). Nevertheless, by construction, our

sample comprises co-habiting couples, which may be a self-selected sample of all couples experiencing unemployment. We test whether partnership dissolution through divorce and separation following the unemployment episode influences the results. Specifically, exploiting the panel structure of the data, we created a binary indicator variable that is equal to one if the indirectly-affected spouse separates or divorces from the current partner in the next survey period. The findings reported in Table 7, Columns (2) and (4) indicate that the main effect of spousal unemployment remains robust to this check. In addition, being divorced or separated in the next time period and the interaction term between divorce and spousal job loss is statistically insignificant for both the husband and wife sub-samples. This suggests that divorce among couples experiencing unemployment does not bias the results.[15]

Third, the life satisfaction decline that indirectly-affected spouses experience may be due to financial concerns about the future. Germany provides a relatively liberal unemployment insurance package in the first year of unemployment, which may mitigate the labor income loss due to unemployment. However, as the unemployment duration increases, both the re-employment probability and household income decrease. Therefore, the life dissatisfaction that indirectly-affected spouses experience may be due to concerns about the future rather than the present situation. To understand the extent to which such concerns influence our results, in Table 8 we control for the duration of the spouse's current unemployment episode (Models (1) and (3)) and for household income in the next survey period (Models (2) and (4)). The main results remain robust to these checks.

A fourth identification threat may arise if plant closures are the result of certain regional shocks that also simultaneously influence life satisfaction. For example, firm closures may be

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[15] In separate specifications, following Mendolia (2014) we also created a dummy variable for partner change (instead of divorce) but the results (available upon request) were not very telling due to the small number of indirectly affected spouses who change their partner who experienced job loss due to plant closure.

driven by an overall decline in the regional economy and also affect individual life satisfaction, which would upwardly bias our results. To understand the extent to which such region-specific changes matter, we conducted the analyses by including additional interaction terms for federal state and year. Table 9 shows that the main results remain unchanged, although the coefficient estimates are slightly lower.[16] The finding that spousal unemployment leads to life satisfaction declines for both indirectly-affected husbands and wives is robust across different specifications and sensitivity tests. In the next section, we explore whether the results vary for specific socio-demographic groups and offer some explanations for our main insights.

7. Heterogeneity and Explanations

7.1. Do Women React More Strongly to their Husbands' Unemployment?

Our main results suggest that women are slightly more sensitive to their husbands' unemployment than men are to their wives' joblessness. While the differential between men and women is very small, the psychology literature documents women's more emotional and empathetic reactions compared to men (Chaplin & Aldao, 2013; Fujita, Diener, & Sandvik, 1991; Mestre, Samper, Frías, & Tur, 2009). To understand whether wives indeed react more intensely to their husbands' unemployment than vice versa, we combine the two analyses samples and run a regression interacting the gender of the indirectly-affected spouse with spousal unemployment.[17] Table 10 reports the findings. In this setup, the coefficient estimate for the job loss variable (-0.33) corresponds to husbands' life satisfaction reactions when their wives become unemployed and is a direct parallel to the finding in Table 4, column (3). The coefficient

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[16] Ideally, we would have wanted to check whether local-level shocks influence the results. Indeed, we merged the GSOEP data with regional-level (Raumordnungs-Regionen (ROR)) data from the INKAR database. However, we do not have sufficient degrees of freedom to identify these models. We offer analyses controlling for ROR-level unemployment in Table A2 in the appendix. All regressions are for 1998, 2001-2013 due to the INKAR data availability.

[17] We had to drop two couples due to duplication.

estimate for women whose husbands become jobless is given by summing up the coefficients for *job loss* and that for the interaction *job loss×female* and corresponds to the finding in Table 4, column (6). The interaction term is statistically insignificant, suggesting that there is no difference between the life satisfaction responses between spouses of both genders. Put simply, husbands and wives care just as much when their spouse involuntarily loses their job.

7.2. Do the Results Depend on Who the Primary Earner Is?

In Table 4, we show that these coefficient estimates in a regression excluding income hardly differ from those controlling for household income. In Table 10, we further explore whether the results depend on who the primary earner is. [18] The intuition is that spousal unemployment may not be as detrimental for the indirectly-affected spouse if the unemployed partner was not the primary earner in the couple. Models (1) and (5) show that the primary earner variable and its interaction with spousal job loss are insignificant, suggesting that the results do not depend on this factor.

7.3. Is There a Social Norm of Unemployment at the Couple Level?

Following Clark (2003), we test whether there is a social norm of unemployment within the couple, i.e. whether own unemployment mitigates the negative well-being consequences of spousal job loss due to plant closure. While personal unemployment is negatively associated with life satisfaction, the interaction term is statistically insignificant, suggesting that own unemployment has no additional effect above and beyond the negative impact of spousal job loss due to company closure.

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[18] We define the primary earner as the partner earning at least 500 Euros more per year than his or her spouse. We perform similar exercises using wider earning gaps between spouses, up to 2000 Euros per year. The results are robust to the usage of different thresholds to define the primary earner.

7.4. Do the Effects Differ Across the Earnings Distribution?

Furthermore, we explore the extent to which the main effects that we identify differ for those at the bottom and the top of the household income distribution. For this purpose, in separate regressions we interact an indicator variable for bottom (top) quartile earners with the job loss variable. The results presented in Models (3)-(4) and (5)-(6), respectively, demonstrate that there are no differential effects at either end of the earnings distribution. In other words, spousal job loss hits indirectly-affected spouses coming from both relatively poor and relatively rich households.

The results presented in this section imply that the life satisfaction penalty from spousal unemployment is likely due to psychological distress and the non-pecuniary costs of unemployment. This stipulation squares with the literature on emotional contagion (Hatfield, Cacioppo, & Rapson, 1994; Kramer, Guillory, & Hancock, 2014), suggesting emotional states can be transferred from one individual to another via copying emotional reactions and facial expressions. Humans tend to reveal their experienced emotions and may produce analogous emotional responses in others. For example, a smile can trigger a smile in our interlocutors. In line with these intuitions, in a recent paper Fowler and Christakis (2008) find that cohabiting spouses who become happy increase the likelihood that their partner is happy by 8 percent, while no such effects exist for non-co-resident spouses. While we cannot directly test for emotional contagion with the data at hand, this explanation helps to provides one intuition for our results. Our findings also corroborate the literature on the individual well-being consequences of

unemployment suggesting that the human costs of joblessness are mainly psychological and non-pecuniary.[19]

9. Conclusion

Personal unemployment has large psychological costs that extend beyond the mere income loss. Furthermore, the costs of unemployment are not only borne by those directly affected by it, but also by other household members such as spouses. Using household panel data from Germany with information on exogenous unemployment entry, we show that spousal job loss due to workplace closure has pronounced negative consequences for indirectly-affected partners. Husbands' life satisfaction drops by about 0.3 points following their spouse's unemployment, while the life satisfaction of wives whose partner becomes unemployed drops by about 0.4 points.

Our results are robust to a number of sensitivity checks, including controlling for the job loss anticipation, accounting for panel attrition, couple dissolution, the unemployment duration, future income flows and regional shocks. Furthermore, the findings imply that the large psychological costs of spousal unemployment do not seem to be due to an income effect or pecuniary consideration but rather to psychological scarring. These results are in line with Marcus (2013), Mendolia (2014) and Bubonya et al. (2014), who find that income is not the primary driver of the mental health deterioration among indirectly-affected spouses.

Our analysis has several policy implications. First, policies aimed at alleviating the consequences of unemployment should also consider other household members and especially female partners. Second, in the spirit of Bubonya et al. (2014), we argue that unemployment policies that simply provide monetary assistance are unlikely to restore affected families' well-

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[19] For comparison purposes, we also conducted analyses whereby individuals become unemployed due to their own resignation, i.e. voluntary unemployment (Table A4). In line with expectations, the results suggest that spousal voluntary unemployment is unassociated with the life satisfaction of the indirectly affected partner.

being. Finally, our findings are also informative to employers that may want to consider a household perspective when designing severance packages.

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TABLES AND FIGURES

Table 1: Variable definitions

Variable	Definition
Dependent Variables	
Life satisfaction	Overall life satisfaction on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied
Life satisfaction domains	
Housework	Satisfaction with housework on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied
Leisure	Satisfaction with amount of leisure time on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied
Hhld income	Satisfaction with household income on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied
Living standard	Satisfaction with standard of living on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied
Health	Satisfaction with health on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied
Independent Variables	
Key regressor	
Spousal job loss due to plant closure	1=job terminated due to workplace closure among those privately employed in previous time period, 0= employed as a private employee
Socio-economic characteristics	
Age	Age in years
Years of education	Number of years of education
Private employee	1=private employee including 20 occupational position categories, 0=other types of occupational positions
Pensioner	1=pensioner, 0=other types of occupational positions
Registered unemployed	1=registered unemployed, 0=other types of occupational positions
Not employed	1=not employed, 0=other types of occupational positions
Self-employed	1=self-employed including 13 categories of occupational position, 0=other types of occupational positions
Civil servant	1=civil servant including 4 categories of occupational position, 0=other types of occupational positions
Currently in education	1=in education, 0=other types of occupational positions
Currently in military	1=military and community service, 0=other types of occupational positions
Annual work hours	Annual work hours of individual
Disabled	1=disabled, 0=not disabled
Household characteristics	
No. persons in the household	Number of persons in the household
No. children in the household	Number of children in the household
Home ownership	1=owner of dwelling, 0=not owner of dwelling
Disposable household income	Household post-government income
Household income from asset flows	Household income from savings, dividends, and rents
West Germany	1=reside in West Germany, 0=reside in East Germany

State dummies	Dummy variables for 16 federal states
Year dummies	Dummy variables for years 1991-2013
ROR dummies	Dummy variables for 96 German regional policy regions (ROR)
Controls for the robustness checks	
Lag of job loss expectation	Expect to lose job in next 2 years, on a 4-point scale: [1] unlikely, [2] probably not, [3] probably, [4] certain
Not in sample in t+1	1=respondent is not surveyed in subsequent year, 0=available response in subsequent survey year
Divorced/separated in t+1	1=respondent is divorced or separated in subsequent year, 0=otherwise
Duration of current unemployment episode	Duration of current unemployment spell, i.e., the number of years the individual is unemployed, not including previous unemployment episodes.
ROR-level unemployment rate	Unemployment rate at the level of German regional policy regions (ROR)

Source: Authors based on GSOEP Codebooks

Table 2: Summary statistics for selected variables, analysis sample

	Male partner		Female partner	
	Mean	Std. Dev.	Mean	Std. Dev.
Indirectly-affected spouse's characteristics				
Life satisfaction	6.972	1.683	7.120	1.632
Age	46.767	10.398	41.897	9.837
Years of education	12.221	2.648	11.893	2.516
Private employee	0.688	0.463	0.607	0.488
Pensioner	0.078	0.269	0.030	0.171
Registered unemployed	0.052	0.222	0.053	0.225
Self-employed	0.098	0.298	0.040	0.195
Annual work hours	1,998	916	1,119	925
Disabled	0.098	0.298	0.056	0.229
Household characteristics				
No. persons in the household	3.065	1.049	3.330	1.169
No. children in the household	0.667	0.896	0.938	1.047
Home ownership	0.552	0.497	0.533	0.499
Disposable household income	42,404	24,267	40,398	21,266
Household income from asset flows	2,017	14,045	1,361	5,663
Number of couple-years	44,603		52,598	
Number of couples	8,333		9,043	
Number of wives experiencing job loss	205		-	
Number of husbands experiencing job loss	-		262	

Source: Authors' calculations based on GSOEP 1991-2013

Notes: The table shows the means and standard deviations of key variables used in the regression analyses. The directly affected spouses are those who were employed in the private sector at t-1, become unemployed due to plant closure and are registered unemployed at time t. The data exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 3: Summary statistics for selected variables, spouses with unemployed partners

	Partner Lost Job Due to Plant Closure				Partner Registered Unemployed			
	Husband		Wife		Husband		Wife	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Indirectly-affected spouse's characteristics								
Life satisfaction	6.278	1.806	6.218	1.868	6.952	1.692	7.087	1.654
Age	47.420	10.765	44.019	11.089	46.742	10.454	41.905	9.934
Years of education	11.434	1.880	11.330	2.300	12.203	2.640	11.869	2.511
Private employee	0.693	0.463	0.492	0.501	0.685	0.464	0.604	0.489
Pensioner	0.068	0.253	0.084	0.278	0.079	0.270	0.032	0.176
Registered unemployed	0.083	0.276	0.145	0.353	0.055	0.229	0.058	0.233
Self-employed	0.093	0.291	0.031	0.172	0.098	0.297	0.039	0.195
Annual work hours	2,014	962	1,052	961	1,989	921	1,119	927
Disabled	0.098	0.297	0.092	0.289	0.099	0.298	0.057	0.232
Household characteristics								
No. persons in the household	3.054	1.030	3.260	1.226	3.066	1.050	3.323	1.171
No. children in the household	0.663	0.912	0.817	1.016	0.669	0.897	0.933	1.048
Home ownership	0.463	0.500	0.439	0.497	0.547	0.498	0.525	0.499
Disposable household income	32,043	16,523	35,025	24,460	42,029	24,123	39,994	21,243
Household income from asset flows	1,193	5,317	840	2,328	1,981	13,848	1,332	5,567
N	205		262		46,219		55,115	

Source: Authors' calculations based on GSOEP 1991-2013

Notes: The table shows the means and standard deviations of key variables used in the regression analyses for the indirectly-affected spouses whose partner loses their job due to plant closure (left panel) and those whose partner becomes unemployed for any reason (right panel). The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response. The differences between husbands whose wives lost jobs due to plant closure and due to other reasons are statistically insignificant except in the case of education, income, and home ownership. The differences between the wives of those who lost job to plant closure and due to other reasons are, however, statistically significant, except in the case of self-employment, annual work hours, household size, and household income from asset flows.

Table 4: Effect of one spouse's job loss on the life satisfaction of the other spouse

	Male partner			Female partner		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Life satisfaction of the indirectly-affected spouse						
Spousal job loss due to plant closure	-0.333***	-0.337***	-0.332***	-0.381***	-0.381***	-0.396***
	(0.104)	(0.104)	(0.103)	(0.100)	(0.100)	(0.100)
Age	-0.047***	-0.047***	-0.065***	-0.066***	-0.066***	-0.076***
	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.013)
Age^2/100	0.023	0.023	0.033**	0.040***	0.040***	0.044***
	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)
Years of education	-0.022	-0.023	-0.026	0.037*	0.037*	0.036*
	(0.024)	(0.024)	(0.023)	(0.022)	(0.022)	(0.022)
No. persons in the household	-0.040**	-0.041**	-0.097***	-0.030*	-0.030*	-0.076***
	(0.019)	(0.019)	(0.020)	(0.016)	(0.016)	(0.017)
No. children in the household	0.020	0.020	0.063***	0.027	0.027	0.055***
	(0.019)	(0.019)	(0.020)	(0.017)	(0.017)	(0.017)
Home ownership	0.156***	0.152***	0.133***	0.132***	0.132***	0.115***
	(0.037)	(0.036)	(0.036)	(0.033)	(0.033)	(0.033)
Hhld asset flow income (log)		0.029***			0.000	
		(0.005)			(0.000)	
Disposable hhld income (log)			0.368***			0.271***
			(0.042)			(0.039)
Employment status (Ref: private employee)						
Civil servant	-0.059	-0.059	-0.069	-0.052	-0.053	-0.080
	(0.106)	(0.106)	(0.106)	(0.091)	(0.091)	(0.091)
Currently in military	-0.411**	-0.405**	-0.349*	-1.778**	-1.778**	-1.802**
	(0.189)	(0.189)	(0.190)	(0.712)	(0.713)	(0.724)
Pensioner	-0.007	-0.005	-0.002	0.046	0.046	0.031
	(0.057)	(0.056)	(0.057)	(0.077)	(0.077)	(0.077)
Not employed	-0.833***	-0.833***	-0.801***	0.025	0.025	0.029
	(0.137)	(0.137)	(0.136)	(0.026)	(0.026)	(0.026)
Registered unemployed	-0.872***	-0.871***	-0.872***	-0.498***	-0.498***	-0.503***
	(0.050)	(0.050)	(0.050)	(0.040)	(0.040)	(0.040)
Currently in education	-0.142	-0.148	-0.111	-0.028	-0.028	-0.014
	(0.113)	(0.113)	(0.114)	(0.080)	(0.080)	(0.080)
Self-employed	-0.057	-0.067	-0.097	0.096*	0.096*	0.089
	(0.059)	(0.059)	(0.059)	(0.055)	(0.055)	(0.055)
Annual work hours	0.000***	0.000***	0.000	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Disabled	-0.310***	-0.309***	-0.309***	-0.353***	-0.353***	-0.350***
	(0.055)	(0.055)	(0.055)	(0.063)	(0.063)	(0.063)
West Germany	-0.183	-0.190	-0.162	-0.069	-0.070	-0.088

	(0.272)	(0.265)	(0.262)	(0.216)	(0.216)	(0.219)
Constant	9.282***	9.192***	6.295***	8.933***	8.935***	6.656***
	(0.581)	(0.575)	(0.654)	(0.496)	(0.496)	(0.588)
State and year dummies	Y	Y	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y	Y
No. observations	44,603	44,603	44,603	52,598	52,598	52,598
Adjusted R^2	0.540	0.541	0.542	0.506	0.506	0.507
No. individuals (couples)	8,333	8,333	8,333	9,043	9,043	9,043

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 5: The effects of spousal job loss on different life satisfaction domains, fixed effects

	Male partner					Female partner				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Housework	Leisure	Hhld income	Living standard	Health	Housework	Leisure	Hhld income	Living standard	Health
	Dependent variable: Satisfaction of the indirectly-affected spouse									
Spousal job loss due to plant closure	0.218	-0.129	-0.645***	-0.413***	-0.009	0.055	0.064	-1.020***	-0.363***	-0.092
	(0.237)	(0.155)	(0.123)	(0.128)	(0.123)	(0.119)	(0.134)	(0.120)	(0.125)	(0.115)
State and year dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. observations	26,622	42,927	44,307	28,882	44,535	44,612	50,325	52,306	35,615	52,523
Adjusted R^2	0.402	0.510	0.583	0.549	0.556	0.452	0.470	0.570	0.544	0.516
No. individuals (couples)	6,630	8,280	8,321	7,374	8,330	8,364	8,983	9,034	8,220	9,040

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 6: Effect of one spouse's job loss on the life satisfaction of the other spouse, with a control for job loss expectation, fixed effects

	Male partner		Female partner	
	(1)	(2)	(3)	(4)
Dependent variable: Life satisfaction of the indirectly-affected spouse				
Spousal job loss due to plant closure	-0.260*	-0.301***	-0.468***	-0.380***
	(0.147)	(0.105)	(0.155)	(0.101)
Lag of job loss expectation (Ref: unlikely)				
Not probable	-0.080***		-0.029	
	(0.028)		(0.027)	
Probable	-0.154***		-0.077*	
	(0.049)		(0.046)	
Certain	-0.215**		-0.244***	
	(0.089)		(0.086)	
Lag of job loss expectation (Ref: missing)				
Unlikely		-0.040		-0.019
		(0.062)		(0.053)
Not probable		-0.109*		-0.055
		(0.062)		(0.052)
Probable		-0.186**		-0.113*
		(0.073)		(0.060)
Certain		-0.218**		-0.233***
		(0.094)		(0.089)
State and year dummies	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y
No. observations	19,553	44,603	23,248	52,598
Adjusted R^2	0.539	0.542	0.518	0.507
No. individuals (couples)	6,550	8,333	7,212	9,043

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The job loss expectation variable refers to the directly affected spouse's job loss expectation in the next two years. In all regressions, this variable is lagged one time period. Because the job expectation variable was not asked in all years, to prevent non-random attrition bias due to non-response, columns (3) and (4) include an indicator for missing values. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 7: Effect of one spouse's job loss on the life satisfaction of the other spouse, with a control for job loss expectation, fixed effects

	Male partner		Female partner	
	(1)	(2)	(3)	(4)
	Attrition	Couple dissolution	Attrition	Couple dissolution
Dependent variable: Life satisfaction of the indirectly-affected spouse				
Spousal job loss due to plant closure	-0.330***	-0.318***	-0.395***	-0.372***
	(0.103)	(0.106)	(0.100)	(0.107)
Not in sample in t+1	-0.252***		-0.194***	
	(0.029)		(0.028)	
Divorce/separation in t+1		0.111		-0.014
		(0.082)		(0.091)
Divorce/separation in t+1*Spousal job loss		0.607		-0.396
		(1.015)		(0.414)
State and year dummies	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y
No. observations	44,603	40,607	52,598	48,470
Adjusted R^2	0.543	0.541	0.508	0.510
No. individuals (couples)	8,333	7,395	9,043	8,154

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The job loss expectation variable refers to the directly affected spouse's job loss expectation in the next two years. In all regressions, this variable is lagged one time period. Because the job expectation variable was not asked in all years, to prevent non-random attrition bias due to non-response, columns (3) and (4) include an indicator for missing values. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 8: Effect of one spouse's job loss on the life satisfaction of the other spouse, controls for unemployment duration and future household income

	Male partner		Female partner	
	(1)	(2)	(3)	(4)
Dependent variable: Satisfaction of the indirectly-affected spouse				
Spousal job loss due to plant closure	-0.402**	-0.319***	-0.396***	-0.345***
	(0.178)	(0.104)	(0.100)	(0.103)
Duration of current unemployment episode	0.038		0.001	
	(0.074)		(0.019)	
Disposable hhld income (log) in t+1		0.327***		0.198***
		(0.046)		(0.033)
State and year dummies	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y
No. observations	44,603	39,486	52,598	46,998
Adjusted R^2	0.542	0.545	0.507	0.513
No. individuals (couples)	8,333	7,241	9,043	7,909

Source: Authors' calculations based on GSOEP 1991-2013
Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 9: Effect of one spouse's job loss on the life satisfaction of the other spouse, controlling for state-specific shocks

	Male partner	Female partner
	(1)	(2)
Dependent variable: Life satisfaction of the indirectly-affected spouse		
Spousal job loss due to plant closure	-0.284***	-0.391***
	(0.102)	(0.100)
State and year dummies	Y	Y
State*year dummies	Y	Y
Individual fixed effects	Y	Y
Individual controls	Y	Y
No. observations	44,603	52,598
Adjusted R^2	0.544	0.508
No. individuals (couples)	8,333	9,043

Source: Authors' calculations based on GSOEP 1991-2013
Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 10: Effect of one spouse's job loss on the life satisfaction of the other spouse, gender effects

	(1)
Dependent variable: Life satisfaction of the indirectly-affected spouse	
Spousal job loss due to plant closure	-0.328***
	(0.103)
Spousal job loss*Female	-0.066
	(0.143)
State and year dummies	Y
Individual fixed effects	Y
Individual controls	Y
No. observations	97,199
R^2	0.523
No. individuals (couples)	17,375

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the household level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table 11: Effect of one spouse's job loss on the life satisfaction of the other spouse, channels

	Male partner				Female partner			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Life satisfaction of the indirectly-affected spouse							
Spousal job loss due to plant closure	-0.540**	-0.322***	-0.241**	-0.312***	-0.471***	-0.357***	-0.415***	-0.323***
	(0.231)	(0.105)	(0.121)	(0.106)	(0.114)	(0.109)	(0.130)	(0.110)
Indirectly-affected spouse primary earner	0.024				-0.047			
	(0.029)				(0.033)			
Job loss*Primary earner	0.287				0.248			
	(0.259)				(0.240)			
Indirectly-affected spouse unemployed		-0.871***				-0.500***		
		(0.050)				(0.040)		
Job loss*Spouse unemployed		-0.141				-0.288		
		(0.480)				(0.262)		
Household income first quartile			-0.039				-0.034	
			(0.036)				(0.025)	
Job loss*First income quartile			-0.317				0.052	
			(0.226)				(0.203)	
Household income fourth quartile				-0.039				-0.058**
				(0.026)				(0.026)
Job loss*Fourth income quartile				-0.159				-0.403
				(0.366)				(0.260)
State and year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y	Y	Y	Y
No. observations	43,560	44,603	44,603	44,603	51,683	52,598	52,598	52,598
Adjusted R^2	0.543	0.542	0.542	0.542	0.507	0.507	0.507	0.507
No. individuals (couples)	8,275	8,333	8,333	8,333	8,989	9,043	9,043	9,043

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

APPENDIX

Table A1: Effect of own job loss on own life satisfaction

	Males			Females		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Own life satisfaction						
Job loss due to plant closure	-0.979***	-0.975***	-1.015***	-0.783***	-0.783***	-0.792***
	(0.117)	(0.118)	(0.117)	(0.118)	(0.118)	(0.118)
State and year dummies	Y	Y	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y	Y	Y
Individual controls	Y	Y	Y	Y	Y	Y
Income control	N			N		
Household income from asset flows control		Y			Y	
Disposable income control			Y			Y
No. observations	55,384	55,384	55,384	44,006	44,006	44,006
Adjusted R^2	0.519	0.519	0.520	0.507	0.507	0.508
No. individuals (couples)	9,432	9,432	9,432	8,219	8,219	8,219

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

As noted in Section 6, our results could be due to region-specific shocks, such as rising regional unemployment resulting from declining industries, influencing both firm closure and well-being. To see whether this identification threat changes our results, we merged the GSOEP sample with unemployment data at the regional (i.e., ROR-level) from the INKAR database. The unemployment data on the 96 ROR regions in Germany is available starting in 1998. Ideally, we would have wanted to include regional-level (ROR-level) fixed effects but unfortunately this was unfeasible as some RORs do not have any "treated couples." Instead, we conducted the analyses controlling for the local unemployment rate. Note also, that the plant closure variable is not available in 1999 and 2000, and these years are excluded from the regressions. Table A1 presents the results.

In Models (1) and (4), we replicate the baseline results (i.e., those reported in Table 4) for the 1998-2013 sample. Based on these results, it is clear that the 1998-2013 sub-sample is different from the main sample. Table A1, model (1) shows that the coefficient for spousal job loss is negative but statistically significant, which is unsurprising given the smaller number of treated couples. The results in model (4), whereby the husband loses his job, remain significant. Adding the regional-level unemployment (Models (2) and (4)), which itself is negatively associated with both male and female partner's life satisfaction, does not change the coefficient estimate on the spousal job loss due to plant closure. Finally, the regional unemployment level has no additional effect on the indirectly-affected spouse's well-being when interacted with spousal unemployment in Models (3) and (6). These findings suggest that the results that we identify are not driven by the regional unemployment conditions, at least for the 1998-2013 sub-sample.

Table A2: Effect of one spouse's job loss on the life satisfaction of the other spouse, ROR-level unemployment

	Male partner's life satisfaction			Female partner's life satisfaction		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: Life satisfaction of the indirectly-affected spouse						
Spousal job loss due to plant closure	-0.150	-0.149	-0.553	-0.380***	-0.375***	-0.791**
	(0.160)	(0.160)	(0.337)	(0.130)	(0.130)	(0.359)
ROR-level unemployment rate		-0.023**	-0.023**		-0.027***	-0.027***
		(0.009)	(0.009)		(0.008)	(0.008)
Spousal job loss*ROR-level unemp.			0.038			0.037
			(0.026)			(0.026)
State and year dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. observations	33,938	33,938	33,938	37,933	37,933	37,933
Adjusted R^2	0.561	0.561	0.561	0.517	0.517	0.517
No. individuals (couples)	7,032	7,032	7,032	7,407	7,407	7,407

Source: Authors' calculations based on GSOEP and INKAR data 1998, 2001-2013
Notes: Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.

Table A3: Effect of one spouse's job loss on the life satisfaction of the other spouse, weighted results

	Male partner	Female partner
	(1)	(2)
Dependent variable: Life satisfaction of the indirectly-affected spouse		
Spousal job loss due to plant closure	-0.367***	-0.440***
	(0.122)	(0.113)
State and year dummies	Y	Y
Individual fixed effects	Y	Y
Individual controls	Y	Y
No. observations	42,082	49,941
Adjusted R^2	0.536	0.506
No. individuals (couples)	7,639	8,368

Source: Authors' calculations based on GSOEP 1991-2013
Notes: Robust standard errors in parentheses, clustered at the individual level: *** p<0.01, ** p<0.05, * p<0.1. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response. Regressions use the sample weight.

Table A4: Effect of one spouse's voluntary job loss on the life satisfaction of the other spouse

	Male partner	Female partner
	(1)	(2)
Dependent variable: Life satisfaction of the indirectly-affected spouse		
Own resignation	0.059	-0.252
	(0.114)	(0.178)
State and year dummies	Y	Y
Individual fixed effects	Y	Y
Individual controls	Y	Y
No. observations	44,578	52,437
Adjusted R^2	0.536	0.506
No. individuals (couples)	8,336	9,032

Source: Authors' calculations based on GSOEP 1991-2013

Notes: Robust standard errors in parentheses, clustered at the individual level: *** p<0.01, ** p<0.05, * p<0.1. The analyses exclude 1999 and 2000 as the reasons for job termination excluded the plant closure response.