

# Partner's unemployment and subjective well-being: The mediating role of relationship functioning

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## ABSTRACT

Unemployment affects not only the subjective well-being of the individual, but also that of the partner. Based on the life course perspective and the spillover-crossover-model, we examine the mediating role of relationship functioning for such crossover effects of partner's unemployment on subjective well-being. We also test whether gender differences in the mechanism of relationship functioning can explain the larger overall crossover effects on women compared to men. We use data from the German Family Panel pairfam (2008/09–2018/19), which provide more direct and comprehensive measures of relationship functioning than previous research, and allow us to examine couples' communication and interactions, their conflict styles and behaviors, relationship satisfaction, and perceived relationship instability as mediators. To analyze the impact of the partner's transition to unemployment on subjective well-being, we use fixed effects panel regression models and the product method of mediation analysis to estimate the indirect effects of relationship functioning. The results show that a partner's transition to unemployment has a negative impact on one's own well-being. The effects are more pronounced for women than men which can be partly explained by gender-specific effects of the partner's unemployment on various aspects of relationship functioning, rather than by differential effects of the latter on one's own well-being.

## 1. Introduction

Longitudinal studies have shown that job losses and unemployment have considerable negative crossover effects on partner's well-being (Kim & Do, 2013; Luhmann et al., 2014; Mendolia, 2014; Nikolova & Ayhan, 2018). Whereas most studies report greater crossover effects in women (Bubonya et al., 2017; Inanc, 2018; Marcus, 2013), others find minor differences or even more pronounced effects in men (Luhmann et al., 2014; Nikolova & Ayhan, 2018). However, it remains unclear how such crossover effects, and any potential gender differences if present, can be explained.

Crossover effects can be understood as a fundamental aspect of the principle of linked lives highlighted in life course research (Elder, Kirkpatrick Johnson, & Crosnoe, 2003). Life course events, such as a

transition to unemployment, have repercussions not only for individuals who experience them (Brüderl et al., 2019) but also for significant others, including partners. Examining mechanisms that generate crossover effects adds to our understanding why lives are linked. We argue that this transmission occurs through social interactions within couples, for instance, through negative effects of unemployment on relationship functioning. We also suggest that changes in relationship functioning may help further explain gender differences in the overall crossover effects. Thus, this paper raises two research questions: 1) To what extent can the negative total crossover effect of partner's unemployment on one's own subjective well-being be explained by relationship functioning as a mechanism? 2) Can gender differences in the total crossover effects be partly explained by gender differences in the mediating role of relationship functioning?

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Only two recent longitudinal studies have examined related mediators such as satisfaction with family or social relations (Esche, 2020; Kim & Do, 2013). Kim and Do (2013) found that non-pecuniary factors such as partner's life dissatisfaction, dissatisfaction with family relations, and dissatisfaction with social relations together mediate some of the crossover effects for women, but the authors did not separately examine each mediator or gender differences. Esche (2020) showed that women, but not men, with unemployed partners were more dissatisfied with family life; however, she only used an indirect measure that did not focus on the relationship with the partner and concluded that future research should investigate specific aspects of couple's relationship functioning and gender differences in these.

Building on these studies, our first contribution is to examine the mediating role of relationship functioning in the crossover effects on one's own well-being. Relationship functioning is defined as patterns of interactions between partners and relationship quality (Wickrama et al., 2013). We consider as measures couples' communication and interactions, their conflict styles and behaviors, relationship satisfaction, and perceived relationship instability. By examining whether the indirect effects vary across measures, we not only gain a more comprehensive picture but also provide insights regarding their relative importance, informing future theoretical and empirical research.

Our second contribution is to empirically test whether relationship functioning as a mechanism can also explain gender differences in overall crossover effects. So far, no studies have jointly considered these two distinct constituent links of the mechanism and conducted empirical tests to determine the extent to which each contributes to gender-specific crossover effects on subjective well-being.

To examine how partner's unemployment affects one's own well-being, we use unique data from the German Family Panel pairfam (2008/09–2018/19). This dataset offers direct and detailed measures of different aspects of relationship functioning, making it highly suitable for examining this underexplored mechanism. Our empirical analysis uses fixed effects panel regression models that rule out bias due to time-constant confounding (Brüderl & Ludwig, 2015). We also implement the product method of mediation analysis in fixed effects models (Krug & Prechsl, 2020). This allows us to learn how the indirect effects are generated by examining the effects of partner's unemployment on the mediator, i.e., relationship functioning, and the subsequent effects of the latter on well-being, making it possible to understand the relative importance of each of these constituent links in the chain of mediation, also for explaining gender differences in crossover effects.

## 2. Theory and hypotheses

From the principle of linked lives of life course research (Elder et al., 2003) and the spillover-crossover model (SCM) (Bakker & Demerouti, 2013), it can be expected that unemployment does not only affect the unemployed individual but also their partners. Two mediating factors for crossover effects are considered in these models: reductions in financial resources and reductions in relationship functioning. Economic resources can only explain a part of the total crossover effects and little of the gender gap found in previous studies (Bubonya et al., 2017; Marcus, 2013; Mendolia, 2014; Nikolova & Ayhan, 2018). Thus, an examination of relationship functioning as a mediator can provide a more comprehensive and complementary understanding of how crossover effects manifest through processes of spillover and crossover. Consequently, we focus on this mechanism.

### 2.1. The mediating role of relationship functioning

According to the SCM, experiences at work can spill over to the home domain, and – by altering the behavior of the affected person and changes in social interactions, such as decreased social support or increased social undermining – cross over to the partner (Bakker & Demerouti, 2013). To understand the mediating role of relationship

functioning for the effect of partner's unemployment on well-being, we consider the two constituent links that form the indirect effect: (a) the effect of partner's unemployment on relationship functioning and (b) the effect of relationship functioning on subjective well-being, as illustrated in Fig. 1.

Unemployment has been theoretically argued to have both negative financial and non-financial consequences, with the latter usually regarded to be more important for the negative effects on well-being (Heyne & Voßemer, 2023; van van Scheve et al., 2017). Regarding link (a) in Fig. 1, it can, therefore, be argued that unemployment reduces relationship functioning due to heightened financial pressures and the stigma associated with receiving welfare benefits, which may lead to anxiety and lowered self-esteem (Fuchs et al., 2023). Furthermore, the non-financial effects of unemployment, such as latent deprivation from time structure, social contacts, collective purpose, and a sense of status loss (Knabe et al., 2016), directly alter couples' communication and interactions. Thus, while for some couples, income reductions and stigma related to the dependence on welfare may constitute the primary stressor, it is likely that important income-independent effects of unemployment on relationship functioning also exist.

Previous research has suggested that unemployment of one partner could theoretically also improve relationship functioning through shifting time patterns (e.g., Esche, 2020). Unemployment usually results in more available time for other activities such as leisure or unpaid work. This could result in higher relationship functioning either by increasing time partners spend together or a relief of unpaid work duties of the non-unemployed partner. However, previous studies on the effect of unemployment on housework have shown that the increase in time spent on housework activities by the unemployed person does not result in an equivalent reduction of these activities by the partner (Baranowska-Rataj & Strandh, 2021). Accordingly, we expect that unemployment has an overall negative effect on relationship functioning.

To understand how relationship functioning works as a mediator for crossover effects of unemployment, the second constituent link (b) in Fig. 1 must be considered as well. This link implies that relationship functioning must influence individual's subjective well-being. Building on the social production function theory (Ormel et al., 1999; Esche, 2020), we expect well-being of both partners to be an ultimate outcome, as it is a function of satisfaction with specific life domains such as the couples' relationship. Relationship quality and relationship satisfaction may affect overall life satisfaction through both biological and psychological pathways. For example, positive relations with a partner can increase the secretion of oxytocin, a hormone linked to positive mood and stress relief, thus improving subjective well-being. In addition, according to self-determination theory (Ryan & Deci, 2000), relatedness is one of the key basic human needs, and fulfillment of these needs is essential for achieving life satisfaction. Higher-quality relationships that involve positive interactions, mutual understanding, engaging dialogues or enjoyment, and the exchange of emotional support, build relatedness and foster subjective well-being. Accordingly, a decline in relationship functioning should lead to a decrease of the subjective well-being of both the directly affected individual and their partner. Overall, we expect that:

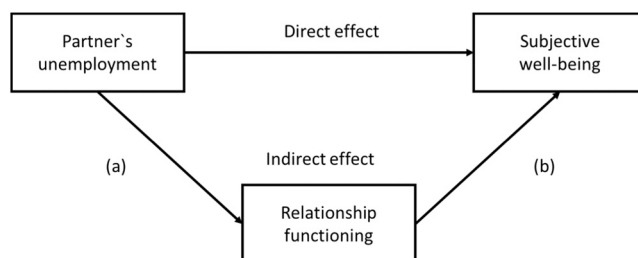


Fig. 1. Relationship functioning as mediator. Notes: Own illustration.

H1: The negative effect of a partner's transition from employment to unemployment on subjective well-being is partly mediated by relationship functioning.

From a theoretical perspective, it remains unclear which of the two constituent indirect effects plays a more important mediating role for the effect of partner's unemployment on subjective well-being. While both links must be active, using the product method of mediation analysis, we will be able to separately examine the relative importance of each.

## 2.2. Gender differences in the mediating role of relationship functioning

Gender differences in the total crossover effects can emerge through gender differences in both direct and indirect effects of partner's unemployment on subjective well-being. In the following, our theoretical focus is on gender differences in the indirect effects, specifically, the mechanism of relationship functioning. We differentiate between the two constituent links (a) and (b) shown in Fig. 1, as gender could potentially moderate either one or both of them.

Gender differences in the link (a) between unemployment and relationship functioning can be best understood through the lens of gender role theories. In conservative societal contexts, social norms about different roles of women and men are internalized through socialization and further reinforced as life course trajectories unfold (Esche, 2020; Knabe et al., 2016). In Germany, as in many other countries, despite a trend towards egalitarianism, men are still more often considered to be the economic providers, while women are expected to take care of household duties and children. Therefore, unemployment leads to a strong deviation from normatively prescribed gender roles for men (Heyne & Voßemer 2023) and may trigger a loss of self-esteem, feelings of shame as well as experiences of stigma. In contrast, unemployment as a form of inactivity makes many women meet gender-specific expectations. Given that the status of women in conservative societies strongly depends on the economic position of their male partners, men's unemployment may pose a more significant threat to the social standing of the female partner compared to the reverse scenario. Furthermore, theories and empirical research in the sociology of emotions state that whereas women internalize stress, men tend to externalize it being more likely to display anger or 'flight or fight' behaviors (Simon, 2014). Responses to the stress resulting from unemployment may lead to altered patterns of social interactions and a reduction of relationship functioning (Blom & Perelli-Harris, 2021). Taken together, men's unemployment can be expected to have a larger negative impact on relationship functioning than women's unemployment.

Gender differences in crossover effects may also arise through the second constituent link (b), meaning that relationship functioning may have a different impact on women's and men's life satisfaction. Two theoretical perspectives explaining gender differences in link (b) are the interpersonal orientation and the subordinate reactivity hypotheses (Robles et al., 2014). The first maintains that women are more aware of the affective quality of relationships due to their relationally interdependent self-representations (Kiecolt-Glaser & Newton, 2001). They are expected to react more strongly to negative life events of family members and have a greater sense of responsibility for them (Conger et al., 1993; Kessler & McLeod, 1984). The second perspective argues that emerging gender differences can be attributed to a different allocation of power between women and men, as individuals with lower status tend to invest more in relationships and are also more vulnerable to stress (Proulx et al., 2007; Wanic & Kulik, 2011). This perspective posits that the adverse aspects of relationship functioning may have a greater impact on women, while positive aspects are equally beneficial for both genders. In line with these theoretical arguments, previous research has not only found that relationship functioning is important for subjective well-being but also that women are affected more strongly by it (Proulx et al., 2007; Robles et al., 2014).

Accordingly, gender differences in the total crossover effects may

arise due to partner's unemployment leading to greater changes in relationship functioning of women than men (link (a)), but also because women's well-being depends more on good relationships and the absence of negative communication and interactions than that of men (link (b)). Overall, we expect that:

H2: The negative indirect effect of a partner's transition from employment to unemployment on subjective well-being via relationship functioning (H1) is larger for women than men.

As for the mediating role of relationship functioning overall (H1), theories and previous studies do not allow making predictions about the relative importance of gender differences in each of the constituent links (a) and (b) for explaining gender differences overall, which is why we empirically examine separately whether one of these links is relatively more important.

## 3. Methods

### 3.1. Data and Sample

We used data from waves Wave 1 (2008/09) to Wave 11 (2018/19) of the German Family Panel pairfam. The dataset provides annual panel data from a nationwide random sample of 18,912 individuals referred to as anchors, spanning four birth cohorts (1971–73, 1981–83, 1991–93, 2001–03). It also includes the information about their partners (Huinink et al., 2011). We, first, selected a sample of anchors who had opposite-sex partners living either in the same or separate household ( $N = 13,424/55,420$  persons/person-years). Second, we excluded Cohort 4 and the refreshment samples, which were only available for a single wave ( $N = 10,929/52,925$ ). For anchors from Cohort 1 and the DemoDiff subsample, only data from Wave 2 or 4 onwards were used, as not all measures were available before ( $N = 10,325/49,767$ ). Both anchors and partners were required to be at least 16 years old ( $N = 10,041/48,672$ ), and to have no missing values on the variables of interest ( $N = 9189/42,358$ ). Table S1 in the Online Supplementary Material (indicated by the prefix S from here onwards) shows that those excluded are overall comparable to those who remain in the sample, but are somewhat less satisfied with life, have partners who are less likely employed, are younger, and have slightly lower level of relationship functioning.

Because we aimed at examining how anchor's subjective well-being is affected by the partner's transition into unemployment, we focused on anchors with partners 'at risk'. We included only those anchors whose partners either transitioned from employment to unemployment (treatment spell) or remained continuously employed (control spells). As we used fixed effects models, each treatment and control spell had to consist of at least two waves to contribute to the analyses ( $N = 5392/29,278$ ). Spells were censored if partners experienced any other changes in their activity status (e.g., transition into out of labor force), couples (temporarily) dropped out due to unit non-response or item non-response of partner's employment status or separated. Further details on the spells are reported below and hypothetical examples explaining their construction are given in the Supplementary Material and Table S2. The minimum, median, and maximum number of person-years for which anchors were observed are 2, 5, and 11, with the full distribution being reported in Table S3. We observed 129 and 268 treatment spells by partners for 120 and 239 men and women respectively. The difference between the number of spells and persons is due to partners with repeated transitions into unemployment, contributing more than one spell. We observed 2458 and 3663 controls spells by partners for 1995 men and 3038 women respectively.

The majority of the 397 treatment spells represented independent experiences of unemployment; in only 24 cases (6%) the anchor experienced a transition into unemployment at the same time as their partner. The comparably small number of treatments spells is typical for studies estimating the effects of rare events applying longitudinal within-designs to household panel data (e.g., Marcus, 2013; Nikolova &

Ayhan, 2018). Therefore, our interpretations primarily focus on point estimates and their effect sizes. We display confidence intervals to illustrate the uncertainty in our estimates (Wasserman & Lazar, 2016), rather than placing emphasis on null hypothesis significance tests and statistical significance.

### 3.2. Measures

Our dependent variable anchor’s subjective well-being was measured on an 11-point life satisfaction scale from 0 (very dissatisfied) to 10 (very satisfied). Global life satisfaction captures the cognitive-evaluative component of subjective well-being, referring to people’s judgments about their life as a whole. It has been shown to be valid, reliable, and sensitive to change, making it well-suited for our analyses (Diener et al., 2013). Descriptive statistics for this and all the other variables are provided in Table 1 separately for women and men. Table S4 provides a decomposition into within- and between-spell variation, as the fixed effects models used only rely on the former, that is, changes within couples over time.

The multivariate analyses also include wave dummies as time-varying confounding variables. These have been omitted here for the sake of brevity.

For our key independent variable, we distinguished three activity statuses of partners at the yearly interview in *t*: employment (e), unemployment (u), and out of labor force (olf). Partners are classified as employed if they report any employment status as main or secondary activity, which includes respondents who are full-time, part time, marginally, or self-employed, and those participating in vocational training while working. Unemployment is determined based on self-reported unemployment status provided by the respondents. Any other activities are classified as being out of the labor force (for a detailed description of how the activity status is measured in pairfam see (Brüderl et al., 2010).

A transition into unemployment was identified when a partner was employed during the interview in wave *t* and subsequently unemployed

**Table 1**  
Descriptive Statistics (Person-Years).

	Men		Women	
	Mean	SD	Mean	SD
<i>Dependent variable</i>				
Life satisfaction (0-10)	7.74	1.46	7.81	1.51
<i>Independent variables</i>				
Partner employed (1 =yes, 0 =no)	0.99		0.98	
Partner unemployed (1 =yes, 0 =no)	0.02		0.02	
<i>Confounding variables</i>				
Age (in years)	35.49	7.07	34.46	7.19
Monthly state-level unemployment rate (%)	7.81	2.89	7.79	2.89
<i>Mediating variables</i>				
1. Network of relationships inventory (NRI) (scale 1-5)				
1a. Intimacy	3.66	0.73	3.89	0.74
1b. Admiration	3.82	0.65	3.72	0.76
1c. Domination	3.16	0.56	2.89	0.59
1d. Conflict	2.46	0.62	2.56	0.66
2. Conflict styles and behavior (CSB) (scale 1-5)				
2a. Verbal aggression (self)	1.58	0.74	1.83	0.90
2b. Verbal aggression (partner)	1.60	0.79	1.66	0.84
2c. Constructive behavior (self)	3.62	0.78	3.83	0.79
2d Constructive behavior	3.60	0.82	3.51	0.91
2e. Withdrawal (self)	2.16	0.91	2.16	0.93
2 f. Withdrawal (partner)	2.02	0.89	2.26	1.02
3. Relationship satisfaction (RS)				
3a. Relationship satisfaction (self) (scale 0-10)	7.90	2.06	7.83	2.14
3b. Relationship satisfaction (partner) (scale 0-10)	7.63	2.02	7.72	2.06
4. Perceived relationship instability (PRI) (scale 0-3)				
	0.33	0.79	0.41	0.89

Note: pairfam, data release 11.0, N = 5392 persons and 29,278 person-years.

during the interview in wave *t* + 1. Each treatment spell included all previous years of employment prior to the transition, as well as all consecutive years of unemployment following the transition. If one partner experienced repeated transitions from employment to unemployment, distinct spells were defined to differentiate the effects from becoming unemployed from those of re-employment. Although wave-to-wave definitions of transitions are commonly used (Esche, 2020; Niko-lova & Ayhan, 2018), they ignore changes in labor market status that occur between waves, leading to an underrepresentation of short unemployment spells and potentially misclassifying control spells. In sensitivity analyses reported in Section 4.2 (Tables S11 and S12), we checked whether using monthly instead of yearly data to define spells changes our results substantially.

Table S5 shows that most treatment spells include only partner’s initial year of entering unemployment, with the median duration of unemployment being Year 0, i.e., the year of entry, and with the maximum being Year 5. In the main analysis, we followed others and averaged across different unemployment durations (Marcus, 2013). However, in sensitivity analyses reported below, we exclusively focused on the year of entry (Table S13). While our analyses included unstable relationships that eventually ended, like almost all previous studies on this topic, and due to the follow-up rules of pairfam, we were unable to track both partners after separation. Given that unemployment may increase the risk of separation (Anderson et al., 2021; Di Nallo et al., 2022; Gonalon-Pons & Gangl, 2021), and these effects are possibly more negative among those who separated, our analyses could potentially underestimate the negative crossover effects, an issue examined in the sensitivity analyses discussed in Section 4.2 and reported in Table S21.

To capture relationship functioning more directly and comprehensively than previous research, we considered 13 different continuous measures that can be grouped into four broader aspects of relationship functioning. These aspects, along with their corresponding measures, are numbered in figures and tables to make it easier for the reader to follow. All these measures consider the anchor’s view, with higher values represent higher levels of what the label indicates (Thönissen et al., 2020). Details on the items underlying the measures of relationship functioning can be found in Tables S6a and S6b; below we provide a short description of these.

Aspect 1: To capture specific interpersonal behavioral aspects, an adaptation of the Network of Relationships Inventory (NRI) was used (Furman & Buhrmester, 1985), describing four measures of partners’ interaction: 1a. intimacy, 1b. admiration, 1c. dominance, and 1d. conflict. Each of these four measures was captured with two items (for the full wording of these items, see Table S6a). For each measure, the mean of two items (scales 1–5) was calculated. Aspect 2: To better understand couple’s communication and interactions during conflict situations, scales of conflict styles and behavior (CSB) were used (Bodenmann, 2000). Similarly, each of these three measures was captured with two items, corresponding to both the anchor and their partner. For three specific measures the mean of two items (scales 1–5) was calculated, once for anchor’s self-assessment and once for their partner’s: 2a. and 2b. verbal aggression, 2c. and 2d. constructive behavior, and 2e and 2 f. withdrawal. Aspect 3: Following recent longitudinal research (Blom et al., 2019, 2023), we examined anchor’s evaluation of both their own (3a.) and partner’s (3b.) relationship satisfaction (RS) on 11-point scales ranging from 0 (very dissatisfied) to 10 (very satisfied). Aspect 4: Perceived relationship instability (PRI) was assessed through anchors indicating the relationship to be in trouble, thinking about separation, or suggesting separation to their partner. The sum of these three items reflected the degree of perceived instability.

As our interest is in estimating crossover effects, we followed methodological recommendations to only adjust for covariates that are considered (time-varying) confounders (Elwert & Winship, 2014). These variables are those that, based on theoretical considerations, are expected to affect the partner’s risks of unemployment and the anchor’s

life satisfaction, and that are not endogenous to partner’s unemployment. As our fixed effects models account for time-constant heterogeneity and to prevent overcontrol bias, we included only age, survey wave, and the state-level unemployment rate in the month of the interview to adjust for time-varying confounding. In contrast, household income is a variable that lies on the causal path from partner’s unemployment to life satisfaction, which is why we intentionally refrained from adjusting for it. In sensitivity analyses reported in Section 4.2 (Tables S17-S19), we tested, however, the extent to which the effects and gender differences are explained by reductions in household income. For some other variables, such as the number of children, the causal role is theoretically more ambiguous. If a partner’s transition to unemployment is affected by fertility, which is also known to affect well-being, it must be considered a time-varying confounder and should be adjusted for. However, unemployment has been shown to also shape childbearing decisions (Alderotti et al., 2021), such that adjusting for the number of children would result in overcontrol bias. Similar arguments regarding the ambiguity in the role of variables as confounders or mediators involve variables such as own employment status, self-rated health, relationship status or duration. In sensitivity analyses reported in Section 4.2 (Table S20), we included all these additional covariates that can be considered either confounders or mediators and checked whether this alters our findings.

### 3.3. Fixed Effects Models

We used linear fixed effects models with  $s$  referring to partner’s treatment and control spells, and  $t$  to the survey wave. All models included interaction terms of all variables with the female dummy variable  $F_s^A$ , meaning that all coefficients were allowed to vary by gender. To keep the notation simple, these interactions are omitted in Eqs. (1) to (3).

$$LS_{st}^A = \gamma T_{st}^p + \delta_1 X_{st} + \mu_{1s} + \varepsilon_{1st} \tag{1}$$

$LS_{st}^A$  is anchor’s life satisfaction in spell  $s$  at survey wave  $t$ , and  $T_{st}^p$  is a dummy variable for partner’s unemployment, taking a value of 0 in years of employment before the transition and a value of 1 in all years of unemployment after the transition. The vector  $X_{st}$  includes time-varying confounding variables, including wave dummies.  $\mu_{1s}$  is a spell-level fixed effect reflecting time-constant heterogeneity, while  $\varepsilon_{1st}$  reflects the idiosyncratic error term. As our units of analysis are partner’s treatment and controls spells—and repeated transitions into unemployment within a single relationship or across different relationships involving the same anchor lead to observations being hierarchically nested in spells, which are in turn nested within relationships and anchors—we clustered the standard errors at the highest (anchor) level. Given that fixed effects models only use variation within spells over time, confounding due to time-constant individual, partner or couple characteristics was ruled out (Brüderl & Ludwig, 2015). Thus, our analytical framework assumes that any partner’s unobserved characteristics are constant during the spell but may vary across spells (or partners). At the same time, to consider the nesting of spells within anchors, standard errors are clustered at the anchor level. The total crossover effects of the partner’s unemployment on anchor’s life satisfaction are given by  $\gamma$ .

To estimate the indirect crossover effects through distinct measures of relationship functioning, for each measure of mediating variables  $M_{st}^A$ , we separately fitted the models in Eqs. (2) and (3) to implement the so-called product method of mediation analysis (Baron & Kenny, 1986). Note that considering the mediators one at a time, as we did in this study, is justified if the mediators do not affect each other in a causal chain (VanderWeele & Vansteelandt, 2014).

$$M_{st}^A = \alpha T_{st}^p + \delta_2 X_{st} + \mu_{2s} + \varepsilon_{2st} \tag{2}$$

$$LS_{st}^A = \gamma' T_{st}^p + \beta M_{st}^A + \delta_3 X_{st} + \mu_{3s} + \varepsilon_{3st} \tag{3}$$

In Eq. (2),  $\alpha$  describes the effect of partner’s unemployment on the respective measure of relationship functioning  $M_{st}^A$ , while in Eq. (3),  $\beta$  is the effect of the latter on life satisfaction. The product  $\alpha * \beta$  then represents the indirect crossover effect of the partner’s transition into unemployment via the chain of mediation from  $T_{st}^p$  to  $M_{st}^A$  to  $LS_{st}^A$ , analogous to the constituent links (a) and (b) in Fig. 1 in the theory section. Because the commonly used Sobel or Aroian standard errors for mediation analysis assume the sampling distribution to be normal and have been shown to be too conservative (Hayes, 2018), we report clustered bootstrap standard errors, which do not share these limitations ( $R = 250$  repetitions). However, both methods provided very similar standard errors. Bootstrapping as a resampling method approximated the standard errors by empirically estimating the sampling distribution of the indirect effect and we constructed normal-based 95% bootstrapped confidence intervals. Note that in the following, we mostly report effects in standard deviations (SDs) of life satisfaction or the respective mediating variables by using standardized versions of the variables of  $LS_{st}^A$  and  $M_{st}^A$ , accordingly changing the meaning of a  $\gamma$ ,  $\alpha$ , and  $\beta$  in Eqs. (1) to (3).

## 4. Results

### 4.1. Multivariate Findings

Before the results of the mediation analyses of crossover effects are discussed, which is the theoretical and empirical focus of our analyses, we first report estimates on the individual consequences of transitions from employment to unemployment for life satisfaction as well as the total crossover effects and how these differ by gender. The estimates of individual unemployment serve as a benchmark for assessing the size of the total crossover effects and provide a plausibility check of our analyses.

Considering the individual consequences of unemployment (Table S7), we found considerable negative effects of own transitions into unemployment of  $-0.78$  (95% CI:  $-1.07, -0.49$ ) and  $-0.47$  scale points (95% CI:  $-0.73, -0.21$ ) for men and women respectively. The size of the effects and the gender gap are highly consistent with previous studies for Germany (Heyne & Voßemer, 2023 ; Nikolova & Ayhan, 2018) and findings from meta-analyses (Paul & Moser, 2009). In summary, becoming unemployed exerted a considerable negative impact on life satisfaction which was more pronounced for men than for women, although this difference could not be estimated precisely as indicated by the wide 95% confidence intervals.

For the total crossover effects, the underlying fixed effects models are reported in Table S8. We found negative crossover effects of  $-0.21$  scale points for men (95% CI:  $-0.48, 0.06$ ), and twice as large negative effects for women of  $-0.42$  scale points (95% CI:  $-0.64, -0.20$ ), with a gender gap of  $-0.21$  (95% CI:  $-0.56, 0.13$ ). To better evaluate the size of the total crossover effects, we express them relatively to the effects of own unemployment as well as in standard deviations (SDs). For men, the total crossover effect was small to moderate, amounting to 27% of the effect of one’s own unemployment or  $-0.14$  standard deviations (SDs) in life satisfaction. For women, unemployment of the partner exerted a moderate to considerable negative total crossover effect of about 90% of the effect of own unemployment or  $-0.28$  SDs in life satisfaction. Our findings confirm previous studies suggesting small to moderate total crossover effects and gender differences with larger negative effects on women (Bubonya et al., 2017; Esche, 2020; Inanc, 2018).

In the next step, we analyze whether the crossover effects are mediated by relationship functioning and whether the mediating role differs by gender. Fig. 2 (see Table S9 and Table S10 in the online supplementary material) addresses this, expressing all effects in SDs of life satisfaction or the respective mediator. The left panel shows how much of the total crossover effects for women and men, indicated by the vertical lines at  $-0.283$  and  $-0.140$  SDs of life satisfaction, were

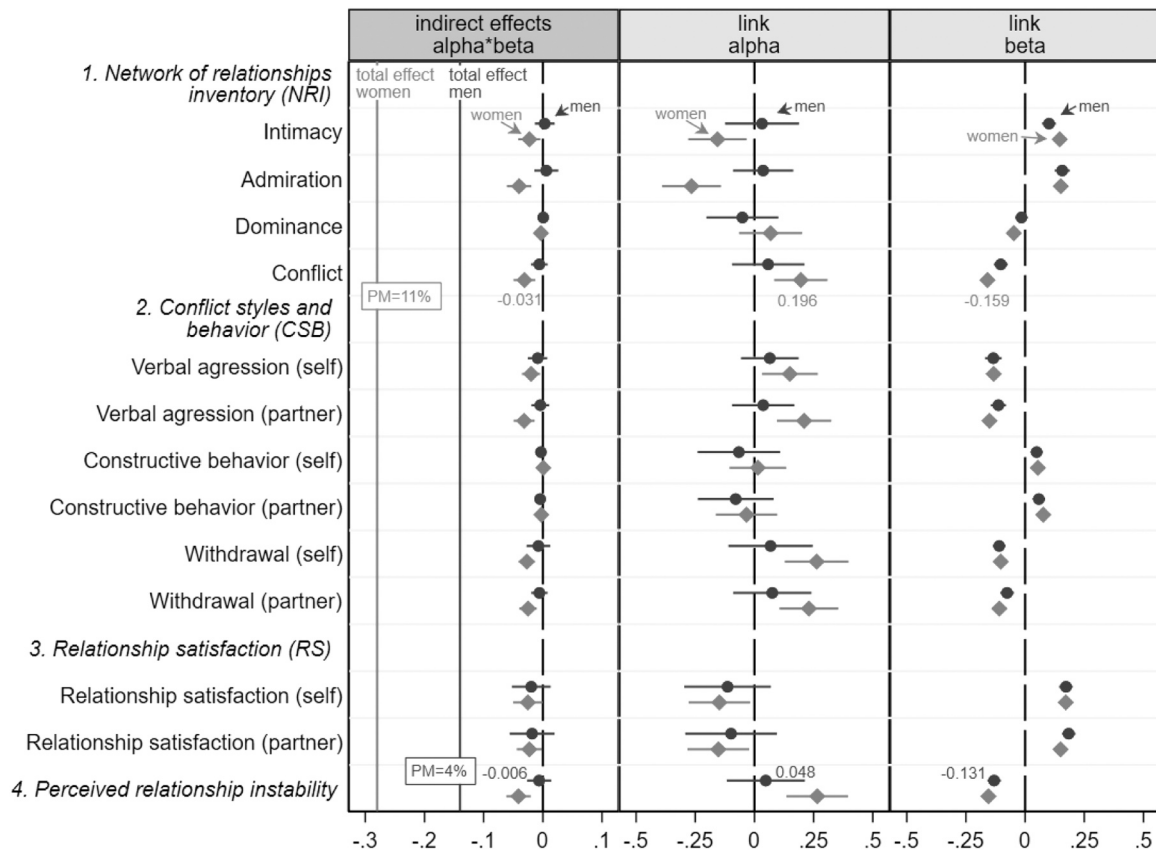


Fig. 2. The Effects of Partner’s Unemployment on Life Satisfaction: Total Effects, Indirect Effects, and Their Links in Standard Deviations. Note: pairfam, data release 11.0, N = 5392 persons and 29,278 person-years; see Table S9 and Table S10.

mediated through the indirect effects of different aspects of relationship functioning. Specifically, the left panel gives the ‘indirect effects alpha\*beta’ for each measure, while the middle (link alpha) and right (link beta) panels show the constituent links. To give an example, the highlighted indirect effect via conflicts (1d.) on women is  $-0.031$  SDs in life satisfaction (left panel). It is the product of partner’s unemployment increasing conflicts by  $0.196$  SDs (link alpha, middle panel) and a SD increase in conflicts reducing women’s life satisfaction by  $-0.159$  SDs (link beta, right panel). Thus, for women the indirect effect via conflicts (1d.) of  $-0.031$  SDs in life satisfaction ( $=0.196 * -0.159$ ) explains about 11% of the total crossover effect on life satisfaction ( $=-0.031 / -0.283 = 0.109$ ) as highlighted in the left panel of Fig. 2.

Contrary to that, for men, the highlighted example shows that perceived relationship instability (4.) has a very small indirect effect of  $-0.006$  (left panel). This negligible indirect effect is the product of links alpha and beta ( $=0.048 * -0.131$ ). It can be explained by the fact that women’s unemployment has almost no effect on perceived relationship instability for men. The middle panel (link alpha) shows an increase of only  $0.048$  SDs of perceived relationship instability due to female partner’s unemployment. The lack of an indirect effect for men, thus, has not to do with men not being negatively affected by relationship instability, as a SD increase in instability, clearly reduces their life satisfaction by  $-0.131$  SDs (link beta, right panel).

The estimates of the total crossover effects (vertical lines at  $-0.283$  SDs for women and  $-0.140$  SDs for men) and indirect effects of partner’s unemployment on women’s (light grey) and men’s (dark grey) SDs of life satisfaction are shown in the left-hand panel (indirect effects alpha\*beta). Exemplary indirect effects in SDs of the mediator are shown for conflict (women,  $-0.031$ ) and perceived relationship instability (men,  $-0.006$ ) and the ratio of the indirect to the total effect gives the percentage mediated (PM, 11% for conflict for women, 4% for perceived

relationship instability for men). The middle panel (link alpha) shows the effect of partner’s unemployment on each measure of relationship functioning in SDs of the mediator, whereas the right panel (link beta) shows the effects of an SD increase in a measure of relationship functioning on SDs in life satisfaction based on separate regression for each mediator. The product of link alpha and link beta gives the indirect effects, in the examples:  $0.196 * -0.159 = -0.031$  and  $0.048 * -0.131 = -0.006$ . Higher values of a measure of relationship functioning indicate a higher level of what the label states. Tables S9 and S10 present the regression coefficients. Spikes show 95% confidence intervals based on clustered (bootstrapped) standard errors (SE) and SEs for the indirect effects have been bootstrapped using  $R = 250$  repetitions.

In the next step, we discuss the overall evidence on all measures of relationship functioning presented in Fig. 2, supplemented by Table 2, in order to evaluate Hypotheses 1 and 2. First, overall, the indirect effects via the different measures of relationship functioning ranged between close to zero and moderate, suggesting mixed evidence regarding Hypothesis 1. According to Table 2, among women, some measures indicate a moderate mediating role of relationship functioning, with the largest PM being 14% for both perceived relationship instability ( $PM = -0.041 / -0.283$ ) and admiration ( $PM = -0.040 / -0.283$ ). For men, many indirect effects were smaller than those for women and close to zero. However, the PM for both measures of relationship satisfaction (self and partner) was 13% and 14%, respectively, for men, surpassing the corresponding PM for women (9% and 8%). Hence, we conclude that the indirect effects via relationship functioning do not appear to be the main reason for crossover effects, suggesting that Hypothesis 1 can only partly be supported.

Concerning Hypothesis 2 and the questions whether gender differences can partly be explained by differences in the mediating role of

**Table 2**  
Fixed Effects Models: Percentage Mediated (PM) by Indirect Effects.

Mediator	PM by Indirect Effects of Female Partner's Unemployment on Male's (Ego) Life Satisfaction	PM by Indirect Effects of Male Partner's Unemployment on Female's (Ego) Life Satisfaction
1. Network of relationships inventory (NRI)		
1a. Intimacy	-2.1%	8.1%
1b. Admiration	-4.3%	14.1%
1c. Domination	-0.7%	1.1%
1d. Conflict	4.3%	11.0%
2. Conflict styles and behavior (CSB)		
2a. Verbal aggression (self)	6.4%	7.1%
2b. Verbal aggression (partner)	2.9%	11.3%
2c. Constructive behavior (self)	2.1%	-0.4%
2d. Constructive behavior	3.6%	1.1%
2e. Withdrawal (self)	5.0%	9.5%
2 f. Withdrawal (partner)	4.3%	8.8%
3. Relationship satisfaction (RS)		
3a. Relationship satisfaction (self)	14.3%	8.8%
3b. Relationship satisfaction (partner)	12.9%	8.1%
4. Perceived relationship instability (PRI)	4.3%	14.5%

Note: pairfam, data release, 11.0, waves 1-11, N = 5392 persons and 29,278 person-years. Please note that PM is a relative measure, its value depends on the size of the total crossover effect.

relationship functioning, Fig. 2 presents a clearer answer. For 11 out of 13 mediators (with constructive behavior being the exception), the point estimates for the indirect effects (left panel) are more negative for women than men, with most estimates for men being close to zero. Moreover, for 9 out of 12 mediators with negative point estimates for women (excluding constructive behavior (self) and relationship satisfaction (self and partner)), the indirect effects are at least twice as large for women than for men (with verbal aggression (partner) being even eight times higher). This indicates that a part of the gender gap in the total crossover effects is attributable to relationship functioning being a more relevant mechanism for women than for men.

The product method of mediation analysis allows to be even more specific and consider the role of each constituent link in the mediation. The lack of essential indirect effects for men is mostly due to the different impact of the partner's unemployment on relationship functioning (link (a), middle panel), underscoring the finding that men's relationship functioning is hardly affected by their female partner's unemployment. Instead, considering constitutive link (b) (right panel), i. e., the effect of relationship functioning on personal subjective well-being, we find substantial effects of almost all measures (except dominance) that are of about equal size for women and men. Thus, we cannot confirm the expectations of the interpersonal orientation and the subordinate reactivity hypotheses, which suggest that relationship functioning is of substantially different importance to women and men (Kiecolt-Glaser & Newton, 2001; Wanic & Kulik, 2011).

An additional contribution of this study is its consideration of various measures of relationship functioning that capture different conceptual

aspects of relationships, including both positive and negative qualities. The results imply that considering various measures of the overall relationship functioning provides a more holistic picture of how relationship functioning changes among men and women in reaction to partner's unemployment.

#### 4.2. Sensitivity analyses

We checked the robustness of our results by exploring different operationalizations of unemployment spells, examined the role of anchor's own unemployment, household income, and potential additional confounders, and considered in more detail the issue of selective separation and its impact on our findings.

To examine to what extent the use of monthly instead of yearly data on unemployment in the definition of treatment spells affected our findings, we compared the effects of transitions into own unemployment on life satisfaction when using yearly versus monthly data (Tables S11 and S12). The average effects (Models 1) were nearly identical, and an analysis of the unemployment dynamics (Models 2) suggested that they mostly reflect the consequences during the first year of unemployment. Although this test was indirect—as it refers to one's own unemployment rather than that of the partner due to the unavailability of monthly data on partner's employment status in pairfam—it suggests that it is unlikely that our findings would differ when using monthly data. In Table S13, we tested what happens if we only focus on the year of partner's entry into unemployment (year zero), while disregarding any long-term unemployment. Table S5 shows that most of the unemployment spells do not exceed one year. Therefore, it is unsurprising that the overall results remained consistent. For women, however, the crossover effects were somewhat weaker, suggesting that longer durations of male partner's unemployment could partly explain gender differences.

We did not adjust our main analyses for anchor's own unemployment or household income, as these variables can be considered a mediator of both the total and indirect crossover effects. Life course literature has often viewed partners and families as 'insurance providers' against life course risks (DiPrete 2002), and previous research has pointed to the added worker effect, where job loss prompts one's partner to seek employment, change their current job, or increase their working hours (Bredtmann, Otten & Rulff 2018; Ehlert, 2012). Thus, anchor's own labor market status and household income may be mediators. However, these variables can also function as confounders. Thus, in Tables S14-S16, we show results after controlling for anchor's own labor market status, while in Tables S17 to S19, we report findings adjusted for winsorized real net equivalized household income. The results in Table S14 show that the effects of partner's unemployment remain nearly identical (Models 1 and 2) even after controlling for one's own unemployment and being out of the labor force status. The same applies to all indirect, alpha, and beta effects in Tables S15-S16, which exhibited high robustness compared to Tables S9-S10, respectively. A comparison of the effects of partner's unemployment in Models 1 and 2 in Table S17 shows that income only slightly mediated the total crossover effects, and the gender differences in these effects were not explained by differential income loss associated with the unemployment of women and men. Furthermore, Tables S18 and S19 show that, net of income, the indirect effects were sometimes slightly smaller and at other times larger. This suggests that the mediating role of relationship functioning is mostly independent from reductions in financial resources.

Because there also remains some theoretical ambiguity about whether further covariates should be considered confounders or mediators and whether they should be (not) adjusted for when the interest is in estimating crossover effects, we show in Table S20 that our findings remain consistent after controlling for one's own labor market status, self-rated health, relationship status, relationship duration, the number of persons and children in the household, and the region of residence.

To examine the possibility of underestimating the negative crossover effects due to unemployment increasing the risk of separation, and the

effects being more negative among those who have separated, we conducted several analyses. [Esche \(2020\)](#) argues that separations are less likely to affect immediate effects of unemployment. In [Table S13](#), we show that these effects are similar to our main findings, where we averaged across unemployment durations. A more direct check suggested by [Nikolova and Ayhan \(2018\)](#) is reported in [Table S21](#) showing that especially for women, the crossover effects are more negative among anchors who will separate (Model 1) or will not respond (Model 2) in the next wave. These estimates are highly uncertain as they rest on few observations. However, alongside with descriptive findings indicating that those with a currently unemployed partner are 8% points more likely to separate in the next wave, they support the theoretical arguments that selective separation could lead to an underestimation of the crossover effects and the observed gender differences.

## 5. Discussion

In this study, we examined the crossover effects of a partner's transition into unemployment on one's own subjective well-being, and offered a first detailed investigation into the extent to which these effects can be explained by reductions in relationship functioning. Using unique longitudinal data from the German Family Panel pairfam, our results show that the partner's transition into unemployment exerted small to moderate negative total effects on subjective well-being, and these crossover effects can be partly explained by alterations in relationship functioning. The modest effect sizes concerning how partner's unemployment affects relationship functioning and life satisfaction must be interpreted against the background of the German context, with rather generous unemployment benefits and relatively limited scarring effects among people experiencing job losses ([Gonalons-Pons & Gangl, 2021](#); [Quintini & Venn, 2013](#)).

These results are highly relevant, given the frequency with which families are confronted with the unemployment of one family member and the accumulation of joblessness in households ([Härkönen, 2011](#)). Our study shows that unemployment generates higher societal costs than what is usually assumed in research that examines the well-being of individuals in isolation from their families. Thus, we add to the calls from life course research to consider well-being not merely as an individual characteristic, but as something that is shared within families, communities, and populations ([Settersten et al., 2020](#)). In line with the life course perspective and the principle of linked lives ([Bernardi et al., 2019](#); [Elder et al., 2003](#)), mitigation of the negative consequences of unemployment should not only be targeted at the individuals directly affected but should also consider their spouses as well as the underlying relationship processes within couples. The indirect effects we find via relationship functioning also reaffirm the key idea of the spillover-crossover model, arguing that negative life events in the work domain spill over into the family and, via social interactions, cross over to the partner ([Bernardi et al., 2017](#); [Bakker & Demerouti, 2013](#)).

In accordance with the findings of most ([Bubonya et al., 2017](#); [Esche, 2020](#); [Inanc, 2018](#); [Marcus, 2013](#)), but not all ([Luhmann et al., 2014](#); [Nikolova & Ayhan, 2018](#)) previous studies, we also found that partner's unemployment is more disadvantageous for women than men, with women being twice as strongly affected. Although our estimates of the gender differences were uncertain due to the small number of transitions of unemployment observable in panel surveys like pairfam, they are consistent with the theory. Differences of very similar magnitude have been found in earlier studies for Germany ([Marcus, 2013](#); [Esche, 2020](#)), although some other studies using similar data did not find statistically significant crossover effects ([Luhmann et al., 2014](#); [Nikolova & Ayhan, 2018](#)).

This study further reveals how relationship functioning as a mechanism driving the crossover effects operates differently for women and men. We identified indirect effects of a partner's unemployment on life satisfaction through several dimensions of relationship functioning among women. Women with unemployed partners were not only less

satisfied with their relationships but also reported more negative communication and interactions, along with exhibiting more destructive conflict styles and behaviors, which was reflected in the perception of an increasing relationship instability. In contrast, among men the indirect effects were close to zero for almost all the different measures of relationship functioning considered. An important exception was that the mediating role of changes in relationship satisfaction was higher for men than for women. A possible explanation for this finding is that relationship satisfaction captures more dimensions of relationship functioning that are more important for men than for women.

Our study helps disentangling two theoretical explanations for why the negative crossover effects of unemployment differ by gender. On the one hand, negative economic events may have gender-specific effects on relationship functioning ([Blom et al., 2019](#); [Blom & Perelli-Harris, 2021](#)). On the other hand, the impact of relationships on well-being ([Kiecolt-Glaser & Newton, 2001](#); [Wanic & Kulik, 2011](#)) may be more pronounced in women than in men. We examined potential gender differences in both of these constituent links. Our results indicated limited gender differences in the effects of relationship functioning on subjective well-being, but we did find clear gender differences in how partner's unemployment affects relationship functioning. Thus, our findings support gendered effects of the first link in the causal path, meaning that the gender gap in total crossover effects is partly attributable to how female and male unemployment affect the daily functioning of the family, their communication and interactions, and the perceived instability of relationships.

Nevertheless, some limitations remain. While the use of fixed effects models eliminates confounding originating from time-constant heterogeneity, and the results remained robust to the adjustment of several potential time-varying confounders, time-varying unobserved factors or measurement error may still distort our estimates. Furthermore, we cannot rule out that the relationship between partner's unemployment, relationship functioning, and subjective well-being is partly driven by reverse causality. However, as our results are similar to studies that use job displacement as an exogenous cause for unemployment ([Bubonya et al., 2017](#); [Marcus, 2013](#); [Mendolia, 2014](#); [Nikolova & Ayhan, 2018](#)), we consider it unlikely that they can be explained in this way. Moreover, like most previous studies, we could only examine couples for as long as they stayed together. Those who will eventually separate are relatively more vulnerable to partner's unemployment, as revealed in our sensitivity analyses. Hence, we may have underestimated the negative total crossover effects. However, as the issue of selective separation only concerns a small number of couples, and the findings are very similar in magnitude to studies that were able to follow partners after separation ([Bubonya et al., 2017](#); [Marcus, 2013](#)), we believe that our estimates should not be strongly affected overall.

Finally, due to the rather small sample sizes, we were unable to explore the temporal aspect of the spillover-crossover mechanism, nor could we restrict the sample to couples with valid information on both the anchor's and partner's well-being. While we focused on the rather specific measure of transitions into unemployment, we were unable to examine how the duration of unemployment or repeated spells might impact the results. Another interesting avenue for future research would be to study whether partners' joint experiences of unemployment result in weaker or stronger crossover effects, either due to the 'shared fate' of unemployment or the 'double insecurity' it brings along ([Inanc, 2018](#); [Luhmann et al., 2014](#)). Relatedly, while this study examined the mediating role of relationship functioning, empathy processes may account for the remaining part of the total effect. The spillover-crossover model assumes that partners frequently interact with each other, share the same physical space, and consequently, end up sharing each other's emotional states. In empirical practice, it is difficult to measure empathy as a mediator, but it would be worthwhile to explore this in future research.

Overall, our study shows that the adverse consequences of unemployment also affect partners. These findings contribute to the debate on



the mechanisms that intertwine lives. While this interrelatedness is often mentioned in studies adopting a life course perspective, the underlying mechanisms are not well understood yet (Settersten, 2015). This study shows that the alignment of (and the resulting similarity) in partners' well-being levels result not only from assortative mating, shared environments, and lifestyles but also from the crossover effects of stressful life course events, such as unemployment. Further, we show that relationship functioning belongs to the set of factors mediating the effects of a partner's unemployment and partly explains the previously revealed gender differences. The latter finding calls for studies on how changing gender relations might moderate the effects of a partner's unemployment on relationship functioning and, ultimately, well-being among women and men.

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## CRediT authorship contribution statement

**Jonas Voßemer:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Anna Baranowska-Rataj:** Conceptualization, Formal analysis, Funding acquisition, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. **Stefanie Heyne:** Conceptualization, Formal analysis, Methodology, Writing – review & editing. **Katharina Loter:** Conceptualization, Data curation, Formal analysis, Methodology, Writing – review & editing.

## Declaration of Competing Interest

None.

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## Code availability

The analytic code is publicly available at Open Science Framework website: <https://osf.io/s8xv4/>.

## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.alcr.2024.100606](https://doi.org/10.1016/j.alcr.2024.100606).

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