

Change in maternal well-being during the COVID-19 pandemic: Did pre-pandemic social support and parenting stress buffer or aggravate mental health disparities among lone and partnered mothers in Germany?

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Abstract

Objective: Our study aims to examine whether and how pre-pandemic conditions shaped change in well-being among partnered and lone mothers in Germany.

Background: The lives and daily routines of parents changed dramatically because of the pandemic, which affected their mental health. Particularly mothers reported increased psychological distress during the pandemic, which is likely related to the higher load of care responsibilities mothers shouldered to compensate for pandemic-related childcare and school closures. Yet mixed findings emerged on the pandemic's impact on lone mothers, who were already suffering from poorer mental health compared to partnered mothers.

Method: We use longitudinal data from a probability sample surveyed before and during the pandemic to examine changes in maternal well-being (i.e., subjective psychological well-being and general life satisfaction), and differences between lone and partnered mothers in Germany (N = 3,578; 14.3% lone mothers at baseline).

Results: Socioeconomic status was positively associated with changes in maternal well-being, but no difference emerged between lone and partnered mothers. Although levels of pre-pandemic social support and parenting stress did not affect changes in maternal well-being among partnered mothers, these factors were associated with a less pronounced decline in maternal well-being among lone mothers.

Conclusion: The lack of differences between lone and partnered mothers could be due to implemented institutional safety nets for lone mothers, and increased relationship strain for partnered mothers, during the pandemic.

Key words: psychological well-being, life satisfaction, mental health, family structure, single parents, COVID-19 pandemic



1. Introduction

Since the spring of 2020, the lives and daily routines of parents and families have changed dramatically because of the spread of the respiratory pathogen COVID-19 across the world (Prime et al., 2020; Settersten et al., 2020). Many parents became fully responsible for supervising and schooling their children over extended periods due to the closure of childcare centers or schools and the ban on meeting others outside of their household (e.g., grandparents, non-residential parents, or befriended families). Scholars have argued that this may have harmed advances in gender equality concerning parents' division of labor because mothers, who were already spending more time on care and domestic duties compared to fathers before the pandemic (e.g., Schoppe-Sullivan & Fagan, 2020), took over even more childcare responsibilities during the pandemic (e.g., Biroli et al., 2021; Boll et al., 2023; Hipp & Bünning, 2021; Zoch et al., 2021). In turn, mothers reported higher ratings of psychological distress and parental stress, as well as lower ratings of life satisfaction, compared to fathers during the COVID-19 pandemic (e.g., Dib et al., 2020; Hipp & Bünning, 2021; Li et al., 2021; Möhring et al., 2021). Mixed findings emerged on the pandemic's impact on lone mothers (e.g., Hiekel & Kühn, 2022; Mata et al., 2021; Thomeer, 2023), who were already at a higher risk of suffering from poor mental health before the pandemic because of their exposure to multiple chronic stressors (e.g., higher poverty risk, increased time pressure to manage work and family duties; Chzhen & Bradshaw, 2012; Recksiedler et al., 2023; Pollmann-Schult, 2018; Wickrama et al., 2006).

Considering the pandemic to be a major historic event with severe ripple effects on individuals (e.g., Settersten et al., 2020), we aim to examine changes in maternal well-being in Germany shortly before and during the pandemic. To shed light on mixed findings on lone mothers' well-being during the pandemic, we utilize the theoretical model of risk and resilience in family well-being developed in light of the pandemic (Prime et al., 2020) to test whether changes in well-being differed by family structure because of pre-existing disparities between these groups. Lastly, we draw on the competing role strain and role enhancement perspectives (e.g., Moen et al., 1995) to probe the role of pre-pandemic resources and stressors in shaping changes in maternal well-being among lone and partnered mothers during the pandemic.

2. Theoretical perspectives on maternal well-being, family structure, and the pandemic

Having experienced divorce and separation can be conceptualized as a critical life event that can alter one's subsequent life course (Kreyenfeld & Trappe, 2020) and lower well-being considerably (e.g., Amato, 2010; Leopold & Kalmijn, 2016; Thomas et al., 2017). This is especially true when (young) children are involved (Leopold & Kalmijn, 2016) and questions related to the post-separation division of childcare, child support payments to deal with the situation financially, or competing interests (e.g., work schedules, social obligations, or re-partnering) need to be negotiated. The stress and strain associated with union dissolution can further give rise to a range of secondary stressors through the process of *stress proliferation* (Pearlin, 2010). This is particularly relevant for lone mothers because the vast majority of children still reside with their mother after a breakup (Bernardi et al., 2018) and means that lone mothers' exposure to the primary stressor (i.e., the separation) can trigger a series of gradual risks within the same or other life domains. These, in turn, unfold subsequently and can magnify the detrimental effect of separation on well-being (Avison et al., 2007). For example, lone mothers face a higher poverty risk as single earners and have more fragmented work histories due to issues related to work-family reconciliation as sole caregivers as well (e.g., Chzhen & Bradshaw, 2012; Heintz-Martin & Langmeyer, 2020; Millar & Ridge, 2009). This can have detrimental effects on their mental and physical well-being compared to partnered mothers (e.g., Burstrom et al., 2010; Kühn, 2018; Pollmann-Schult, 2018; Wickrama et al., 2006).

The COVID-19 pandemic, which can be seen as a *major historic event* that affected individuals differently depending on how they were positioned before its onset (Settersten et al., 2020), may have added new stressors (e.g., increased fear, parenting stress, loneliness, or financial pressure) that could widen the gap in maternal well-being between lone and partnered mothers. Prime and colleagues (2020) developed a theoretical *model of risk and resilience in family well-being* in light of the pandemic that can explain some of the underlying mechanisms contributing to subsequent disparities in maternal well-being in general and by family structure. In sum, mothers' ability to adapt to new and unexpected events, such as the pandemic,

depends on the amount of available resources before and during the crisis (e.g., financial, social, or psychological capital), but also on the absence of stressors that prevent a new situation from turning into a crisis (McCubbin & Patterson, 1983). This is further in line with the *social production function* framework (Ormel et al., 1999), which postulates that individuals seek to enhance their well-being by weighing costs and benefits and applying adaptive strategies in light of constraints they face and resources at their disposal (e.g., defined as individuals' ability to substitute or engage in activities to achieve goals). Against this theoretical background, one would expect that mothers who had more pre-pandemic resources (e.g., higher socioeconomic standing [SES], better health, and more social support) and faced fewer pre-pandemic stressors (e.g., lower levels of parenting stress) would also fare better during the pandemic (*Hypothesis 1*). It is further likely that social disruptions associated with the pandemic (e.g., lacking social support for sole-caring and sole-earning lone mothers during implemented lockdown or social distancing measures; Choi et al., 2020), in addition to pre-existing disparities in the load of pre-pandemic stressors associated with union dissolution, increased levels of psychological distress of lone compared to partnered mothers (*Hypothesis 2*).

However, two competing arguments, namely the *role strain* and *role enhancement* perspective, can be used to derive hypotheses concerning the role of pre-pandemic resources on the link between family structure and maternal well-being during the pandemic. The role strain perspective (e.g., Goode, 1960) assumes that, overall, fulfilling multiple social roles is associated with costs rather than benefits because it drains a fixed amount of energy, time, or commitments that can be dedicated to each role. Through this lens, one would assume that additional care roles and obligations during the pandemic affected all mothers, particularly lone mothers who cannot rely on the support of others (e.g., the other parent or other extended kin), negatively. This effect should further be aggravated among lone mothers with the lowest levels of pre-pandemic resources and the highest load of stressors (*Hypothesis 3a*) because their fixed budget of energy, time, and commitment is the most limited. The role enhancement perspective (e.g., Moen et al., 1995), in contrast, outlines the positive effect of being engaged in multiple social roles because of their potential to offer additional social identities, integration, power, prestige, or gratification. Moen and colleagues (1995) further highlight the importance of context concerning role occupation at a given time, which contributes to its net effect on well-being. Thus, one could assume that taking over more roles and obligations during the pandemic may not have harmed the well-being of the least resourceful lone parents (*Hypothesis 3b*) because it provided meaning, affection, or other rewards during a challenging time (cf. Möhring et al., 2023 on the well-being of high-intensity family caregivers during the pandemic).

3. Maternal well-being and family structure before and during the pandemic

Differences in maternal well-being between lone and partnered mothers have been documented by a large body of research before the pandemic (e.g., Avison et al., 2007; Cairney et al., 2003; Dziak et al., 2010; Kühn, 2018; Recksiedler et al., 2023). These disparities arise in part because of pre-existing differences in the distribution of resources and stressors by family structure and could have widened during the pandemic. Important resources and stressors that can affect maternal well-being are, for instance, the amount of social support mothers can rely on and their level of parenting stress (Nomaguchi & Milkie, 2020). Prior studies have shown that lone parents face higher levels of parenting stress and have less social support compared to partnered mothers (Cairney et al., 2003; Cooper et al., 2009; Hwang & Jung, 2020). This can be attributed to the fact that lone mothers face more constraints and role strain in balancing the demands related to being predominately responsible for earning the family income, managing work and family duties, organizing childcare, or engaging in other social obligations. Detriments in social support were further amplified among low-educated or long-term unemployed lone mothers (Keim, 2018; Parkes et al., 2015). Nevertheless, it is important to add that the socio-demographic makeup of lone parents has become more diverse (e.g., in terms of age and SES; Bernardi et al., 2018).

During the pandemic, mothers were especially at risk of experiencing higher levels of stress and this increase was more pronounced among mothers with higher levels of self-perceived economic strain (Gniewosz, 2022). This can lead to poorer mental health (Hiekel & Kühn, 2022)—particularly among lower-educated, financially strained mothers with multiple and younger children in the household (e.g., Feinberg et al., 2021; Guo et al., 2021; Li et al., 2021)—and is likely related to the fact that mothers took over a larger share of household and care work during the pandemic in addition to their usual work schedules (Biroli et al., 2021; Zoch et al., 2021). Lone mothers reported that the amount of unpaid work and time spent with

additional family responsibilities increased during the pandemic as well (Pino Gavidia et al., 2022), which can be linked to increased time pressure and the need to adapt and reschedule daily routines (e.g., to reconcile home-schooling and work schedules; Sánchez-Mira et al., 2021). A qualitative study from the UK found that lone parents were further challenged by the loss of social support, which was expressed as an especially stressful by-product of the pandemic (Dawes et al., 2021). Individuals tend to draw and rely on already established networks during stressful times (i.e., parents or close friends; Kalish et al., 2015). This was more difficult during the pandemic because of implemented social distancing measures (e.g., Sánchez-Mira et al., 2021) and potentially because lone mothers had already less established social support before the pandemic (e.g., Cairney et al., 2003).

Consequently, rates of psychological distress and mental illness increased among lone mothers during the pandemic (e.g., Li et al., 2021; Mata et al., 2021; Taylor et al., 2022). In a U.S.-based mixed-method study examining 200 lone mothers during the pandemic (Taylor et al., 2022), the authors reported that one-third of mothers scored in the moderate to severe range for depression and about half for moderate to severe anxiety. Mata and colleagues (2021) found that the levels of anxiety and loneliness were twice as high at the beginning of lockdowns among lone compared to partnered parents. In contrast, Hiekel and Kühn (2022) concluded that, based on data from the German Family Panel *pairfam*, partnered parents were a more vulnerable group because levels of stress and exhaustion converged with those of lone parents during earlier stages of the pandemic (i.e., spring 2020). These included strict lockdowns and a high degree of uncertainty concerning the spread and severity of COVID-19 (RKI, 2022). Whether pre-pandemic resources and stressors buffered or aggravated pandemic-related declines in well-being among and between lone and partnered mothers, however, has rarely been examined explicitly. Our study aims to fill this gap and shed some light on these mixed findings in Germany.

4. The institutional context and the present study

Our study examines disparities in maternal well-being during the COVID-19 pandemic in Germany, which operates under a modernized male breadwinner model (Grunow et al., 2018). Overall, rather traditional work-care arrangements are promoted among parents through German welfare state institutions, family policies, and widely shared gender beliefs. Thus, the majority of mothers work part-time and still tend to assume the main responsibility for childcare and household chores despite notable shifts in family policies that enhanced maternal labor force participation (e.g., paid paternity leave and the expansion of childcare facilities; Zoch & Schober, 2018). Welfare state policies promoting a highly gendered division of labor affect the growing number of post-separation families as well. The share of lone-parent families among families with minors was about 19% in 2022 and, similar to many other Western countries, the vast majority of those were mothers (about 85%; Destatis, 2023). Lone mothers tend to have lower levels of educational attainment and work more often in part-time jobs with temporary employment contracts, less job autonomy, and fewer supervising responsibilities compared to partnered mothers (Reimann et al., 2019). This, in turn, further elevates the poverty risk of lone mothers in Germany (Hübgen, 2020).

With regard to the COVID-19 pandemic, Germany acted in a quite strict way to control infections (e.g., Carroll et al., 2020; Zerle-Elsässer et al., 2022). In addition to a large body of restrictions concerning social distancing (e.g., severely limiting the amount of face-to-face contact with others), contact with a non-resident parent was explicitly excluded from contact restrictions in Germany. Similar to other countries, remote work was the preferred option for many employers and employees, if possible, and the implementation of short-time work allowed companies to forego layoffs due to the pandemic. Nation-wide lockdowns were implemented on and off depending on respective case numbers until January 2021. However, closed classrooms, schools, and daycare centers due to infections among children and/or their caregivers or teachers put a lot of pressure on mothers specifically to negotiate family, work, and household duties. Although there was a safety net for those who had no other possibility to take care of their children (e.g., lone parents or parents who were considered to be essential workers), quarantine rules were strict and often affected the entire household.

Our study aims to test the following hypotheses against the backdrop of the outlined theoretical considerations, the mixed empirical evidence, and the contextual background. In sum, we expect that: mothers with more pre-pandemic resources and fewer pre-pandemic stressors fared better during the pandemic (*Hypothesis 1*), and lone compared to partnered mothers experienced increased levels of

psychological distress (*Hypothesis 2*). We further offer two contrasting perspectives on the third hypothesis. We anticipate that lone mothers with the lowest level of pre-pandemic resources and the highest load of pre-pandemic stressors fared worst during the pandemic (role strain perspective; *Hypothesis 3a*), or that the least resourceful lone mothers were not affected more negatively during the pandemic (role enhancement perspective; *Hypothesis 3b*).

5. Method

5.1 Data

To address our hypotheses, we capitalized on longitudinal data collected in Germany both before and during the COVID-19 pandemic in contrast to other surveys launched during the pandemic (e.g., Li et al., 2021). We used data from the first wave of the large-scale, representative survey *Growing up in Germany*, which was collected in 2019 and covered a wide range of topics related to families' well-being (Kuger et al., 2023). More specifically, a probability sample of 0–32-year-old target persons was drawn using information from local population registers, and standardized computer-assisted personal interviews were then conducted with these target persons and other household members (i.e., parents of minors or siblings in the target age range). Interviews were conducted from February to November 2019. The overall response rate was about 21% of target persons identified in local population registers. During the pandemic in 2021, respondents were re-surveyed using a reduced set of indicators from the first wave (e.g., on the psychosocial adaptation of target persons and their parents). The response rate in 2021 was about 41% of target persons, who participated in the 2019 assessment. Interviews were conducted from October 2021 to early January 2022. At that time, case numbers of COVID-19 were high, but vaccination and free testing were widely available. Rules to wear masks and testing obligations were still in place, yet Germany was not in a strict lockdown, like in March of 2020, and daycare centers as well as schools were open (e.g., RKI, 2022). We restricted our analytical sample to mothers of minors (i.e., aged 0–17 years) for the purpose of this study. In 2019, the full sample comprised 3,578 mothers of minors (14.3% lone mothers), and 2,092 of these mothers were re-surveyed for the second wave in 2021 (11.0% lone mothers). Logistic regression models predicting attrition between the two waves showed that, for instance, lone mothers and those with higher levels of perceived economic deprivation at baseline were significantly more likely to have dropped out (results available upon request). In contrast, mothers with higher levels of education and income, those with older children, and mothers who worked part-time before the pandemic were more likely to have participated in the 2021 data collection. Although these findings are in line with attrition patterns of other surveys conducted during the pandemic (Biddle et al., 2023), it is important to keep in mind that the remaining participants were likely more affluent and less strained when interpreting our results.

5.2 Dependent variables

We measured mothers' mental well-being with the validated WHO-5 scale assessing *psychological well-being* (Topp et al., 2015) and with the validated single-item indicator for *general life satisfaction* (e.g., Pollmann-Schult, 2018; one model for each outcome). These indicators were measured in both waves and we entered a change score ($\Delta 2021 - 2019$) into our regression models.

To measure psychological well-being, mothers were instructed to rate how often they felt the following emotions during the last two weeks on a scale from 1 "at no time" to 6 "all the time": cheerful and in good spirits; calm and relaxed; active and vigorous; woke up fresh and rested; daily life filled with things that interested me. A composite score was formed and items were recoded so that higher values indicated higher, more positive levels of psychological well-being. The internal consistency of the scale was good (Cronbach's $\alpha = 0.81$ in 2019 and 0.85 in 2021).

To rate one's general life satisfaction, mothers were asked to rate how satisfied they felt with their life overall on a scale from 1 "very satisfied" to 6 "not satisfied at all." Answers were again recoded in a way that higher values indicate higher levels of life satisfaction.

5.3 Independent variables

Our main independent variable was mothers' *lone parent status* (0 = partnered; 1 = lone mother). We defined lone mothers as mothers of minors who were separated or divorced from and did not live in one household with the biological or social father of their child.

Next, we used the perceived amount of *social support* mothers can mobilize and their level of *parenting stress* as measures of resources and stressors that have been linked to maternal well-being (e.g., Balaji et al., 2007; Nomaguchi & Milkie, 2020). The perceived amount of social support was based on the validated Oslo Social Support Scale (OSSS-3; Kocalevent et al., 2018), which groups mothers' ratings on three statements (e.g., "How many people are so close to you that you can count on them if you have great personal problems?" on a scale from 1 "none" to 4 "five or more") into three broad categories of social support (1 = poor, 2 = moderate, 3 = strong). We measured *parenting stress* based on one item of the Parental Stress Scale (Berry & Jones, 1995). Mothers were asked to indicate whether they felt overwhelmed with their parental duties on a scale from 1 (fully agree) to 6 (do not agree at all). Parenting stress was subsequently recoded in a way that higher values signal more parenting stress.

Based on prior literature on differences in the household composition and economic disparities between lone and partnered mothers (e.g., Bernardi et al., 2018; Hübgen, 2020), we also considered these factors as predictors and controls. We entered mothers' *level of schooling* based on the CASMIN educational classification (1 = primary, 2 = secondary, 3 = tertiary= 3; Brauns et al., 2003), their *employment status* (1 = not employed, i.e., unemployed, in post-secondary training, or on parental leave; 2 = marginally or part-time employed; 3 = full-time employed), the *age of the youngest child* in the maternal households (in full year), and the *number of children* in the household (1 = one child, 2 = two children, 3 = three or more children). We also used information on the equalized monthly net *household income* of the maternal household using modified OECD equivalence weights (in Euros). Note that we entered the logged equalized household income into the models because of its skewed distribution and to ease the interpretability of the coefficients. Lastly, mothers' level of *perceived economic deprivation* (Andreß, 2018) was assessed with three items asking mothers to indicate whether the following statements applied to their financial situation (1 = yes; 2 = no because of financial reasons; 3 = no because of other reasons): "We can put away money each month," "We can replace furniture," and "We can pay for unexpected expenses." Negative replies were collapsed into one category and a count of these answers was formed as a count indicator of perceived economic deprivation (1 = none; 2 = low, i.e., count of one; 3 = high, i.e., count of two or three).

All independent variables were entered at baseline into the regression models because, from a theoretical standpoint, the amount of available resources and the load of stressors before the onset of the new and stressful situation (i.e., the pandemic) influence how mothers adapt to and cope with it (McCubbin & Patterson, 1983; Prime et al., 2020).

6. Results

6.1 Descriptive results

A descriptive overview of the sample composition and key study variables is displayed in Table 1. Descriptive differences in the household composition and economic situation of lone and partnered mothers were in line with previous studies (e.g., Bernardi et al., 2018; Heintz-Martin & Langmeyer, 2020). For instance, lone mothers tended to have older and fewer children in their households. A smaller share of lone mothers had tertiary levels of education and their mean household income was lower compared to partnered mothers, even though a larger share of lone mothers reported to be full-time employed. Relatedly, the share of lone mothers reporting high levels of perceived economic deprivation was considerably larger compared to the share among partnered mothers. Social support tended to be sparser and the levels of parenting stress were slightly higher among lone compared to partnered mothers. With regard to the associations between family structure and maternal well-being, we found a decline in the mean of psychological well-being and life satisfaction for all mothers between 2019 and 2021. But there were also differences between these two groups at each time point. Lone mothers had significantly lower ratings of both psychological well-being and life satisfaction compared to partnered mothers in 2019 ($F(df = 1) =$

42.54, $p < .001$, and $F(df = 1) = 140.51$, $p < .001$, respectively) and 2021 ($F(df = 1) = 29.87$, $p < .001$, and $F(df = 1) = 58.82$, respectively). Overall, these descriptive findings indicate that the direction of change should be seen as a decrease in well-being both among lone and partnered mothers and that lone mothers were a more vulnerable group before and during the pandemic.

Table 1: Overview of the sample composition and study indicators

Indicators at baseline	Total	Lone Mothers	Partnered Mothers
<i>N</i> (%)	3,578 (100.0)	513 (14.3)	3,065 (85.7)
Age of mother, <i>M</i> (<i>SD</i>)	38.88 (7.51)	39.65 (8.54)	38.75 (7.32)
Age of youngest child, <i>M</i> (<i>SD</i>)	6.38 (4.96)	8.23 (4.98)	6.06 (4.89)
Number of children, <i>n</i> (%)			
One child	997 (27.9)	218 (42.5)	779 (25.4)
Two children	1,705 (47.6)	182 (35.5)	1,523 (49.7)
Three or more children	876 (24.5)	113 (22.0)	763 (24.9)
Educational attainment, <i>n</i> (%)			
Primary	506 (14.3)	124 (24.4)	382 (12.6)
Secondary	1,120 (31.6)	188 (37.0)	932 (30.7)
Tertiary	1,919 (54.1)	196 (38.6)	1,723 (56.7)
Employment status, <i>n</i> (%)			
Not employed ^a	1,237 (34.6)	159 (31.1)	1,078 (35.2)
Part-time	1,677 (46.9)	205 (40.0)	1,472 (48.1)
Full-time	661 (18.5)	148 (28.9)	513 (16.7)
Household income in Euro, <i>M</i> (<i>SD</i>)	1,900.64 (1,597.40)	1,238.36 (1,043.69)	2,013.38 (1,647.33)
Perceived economic deprivation, <i>n</i> (%)			
None	2,550 (71.6)	219 (43.0)	2,331 (76.4)
Low	554 (15.6)	134 (26.3)	420 (13.8)
High	455 (12.8)	156 (30.7)	299 (9.8)
Social support, <i>n</i> (%)			
Poor	349 (9.9)	91 (18.0)	258 (8.5)
Medium	1,657 (47.1)	259 (51.3)	1,398 (46.4)
High	1,515 (43.0)	155 (30.7)	1,360 (45.1)
Parenting stress, <i>M</i> (<i>SD</i>)	2.17 (1.23)	2.26 (1.33)	2.16 (1.21)
Indicators over time			
Well-being in 2019, <i>M</i> (<i>SD</i>)	4.02 (0.86)	3.79 (0.95)	4.06 (0.84)
Well-being in 2021, <i>M</i> (<i>SD</i>)	3.86 (0.85)	3.57 (0.93)	3.89 (0.83)
Life satisfaction in 2019, <i>M</i> (<i>SD</i>)	4.97 (0.87)	4.56 (0.97)	5.04 (0.84)
Life satisfaction in 2021, <i>M</i> (<i>SD</i>)	4.70 (0.92)	4.27 (1.08)	4.76 (0.89)

Note: ^a includes unemployed mothers and those in training or on maternal leave. Range: age of mother (17-68 years); age of youngest child (0-17 years); household income (80.36-16,875.00 Euro); parenting stress (1-6); psychological well-being (1-6); life satisfaction (1-6)

6.2 Regression results predicting psychological well-being and life satisfaction

Our analyses consisted of pooled-OLS regression models predicting changes in mothers' psychological well-being and life satisfaction based on change scores calculated from two time points (e.g., Δ psychological well-being 2021 – psychological well-being 2019). We ran separate models for psychological well-being and life satisfaction and the analyses were conducted in the following steps. First, we estimated main effect models to test whether lone parent status, SES, social support, and parenting stress before the pandemic predicted change in both outcomes (Model 1; Hypotheses 1 and 2). To probe the role of pre-pandemic social support and parenting stress on the link between family structure and change in maternal well-being (Model 2; Hypotheses 3a and 3b), we then added interaction terms between lone parent status and these two indicators. All models also controlled for mothers' age and household composition. Finally, average marginal effects (AME) were used to examine and illustrate significant interactions. We further calculated and report ΔR^2 between Models 1 and 2 as an effect size estimate, which represents the proportion of

variance explained by the interaction effect above and beyond the explained variance of the main effects and is in line with recommendations for assessing and interpreting interaction effects (e.g., Van Iddekinge et al., 2021). All analyses were conducted in Stata (v15.1) and the regression results are summarized in Table 2.

Table 2: Results of the linear regression models predicting change in psychological well-being and life satisfaction

Predictors	Psychological Well-Being		Life Satisfaction	
	Model 1	Model 2	Model 1	Model 2
Intercept	-1.34 (0.31)***	-1.30 (0.31)***	-1.41 (0.32)***	-1.35 (0.32)***
Lone mother	0.03 (0.07)	-0.12 (0.11)	-0.01 (0.07)	-0.30 (0.14)*
Secondary education	0.14 (0.08)	0.14 (0.08)	0.04 (0.08)	0.04 (0.08)
Tertiary education	0.22 (0.08)**	0.22 (0.08)**	0.15 (0.08)	0.15 (0.08)
Part-time employed	-0.04 (0.05)	-0.04 (0.05)	0.01 (0.05)	0.02 (0.05)
Full-time employed	-0.05 (0.06)	-0.05 (0.06)	0.03 (0.07)	0.02 (0.07)
Low economic deprivation	0.02 (0.06)	0.03 (0.06)	0.06 (0.06)	0.06 (0.06)
High economic deprivation	0.01 (0.08)	-0.00 (0.08)	-0.07 (0.08)	-0.07 (0.08)
Household income	0.11 (0.04)**	0.11 (0.04)**	0.08 (0.04)	0.08 (0.05)
Age of youngest child	-0.00 (0.00)	-0.00 (0.00)	0.01 (0.00)**	0.01 (0.00)**
Two children	0.03 (0.05)	0.03 (0.05)	0.09 (0.05)	0.08 (0.05)
Three or more children	-0.02 (0.06)	-0.02 (0.06)	0.09 (0.06)	0.08 (0.06)
Poor social support	0.12 (0.08)	0.05 (0.09)	0.02 (0.08)	0.00 (0.08)
Medium social support	0.09 (0.04)*	0.07 (0.04)	0.05 (0.04)	0.05 (0.04)
Parenting stress	0.05 (0.02)**	0.05 (0.02)**	0.09 (0.02)***	0.08 (0.02)***
Lone mother x poor social support		0.40 (0.20)*		
Lone mother x medium social support		0.18 (0.14)		
Lone mother x parenting stress				0.14 (0.05)*
R ²	0.020	0.022	0.030	0.032
ΔR^2 Model 2 – R ² Model 1		0.002		0.002

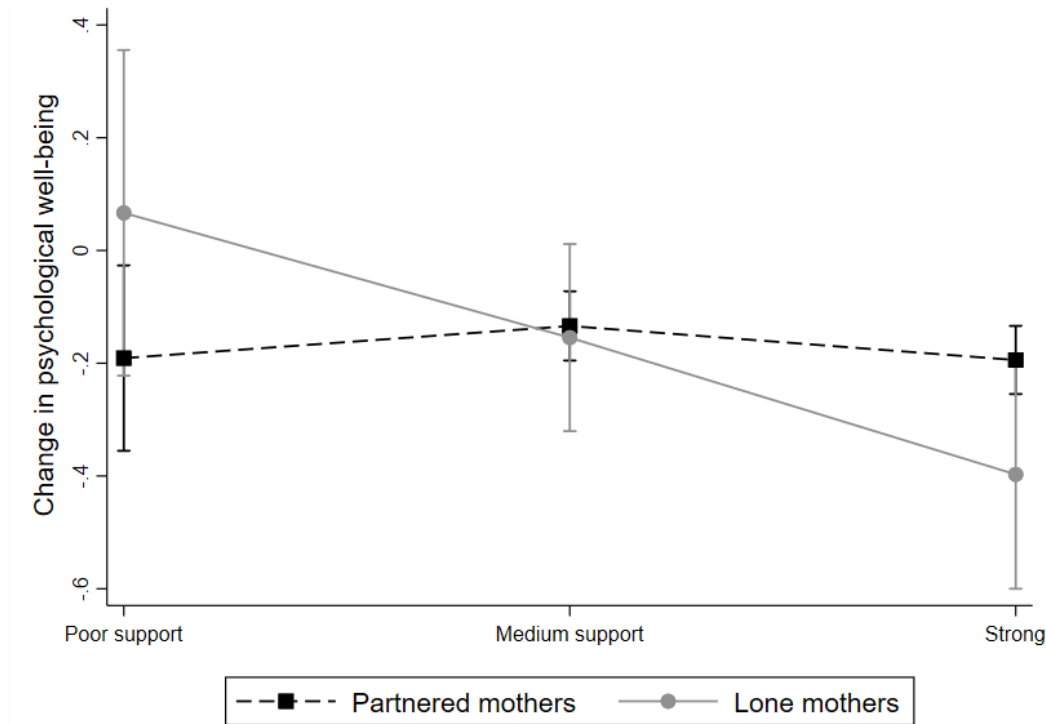
Note: Cells represent B (SD). Reference categories are: partnered mother, primary levels of education, not employed, no perceived economic deprivation, one child in household, high levels of social support. The log of household income was entered into the regression models. * p < .05 ** p < .01 *** p < .001

Results revealed that tertiary levels of education (vs. primary levels) and a higher income were positively linked to change in psychological well-being only (see Model 1). In contrast, a higher age of the youngest child in the maternal household was positively associated with change in life satisfaction. These findings were partly in line with our expectation that a higher SES and having older children would be beneficial for maternal well-being during the pandemic. Interestingly, we also found a positive link between having medium (vs. high) levels of social support before the pandemic and change in psychological well-being, as well as among higher levels of parenting stress before the pandemic and both changes in psychological well-being and life satisfaction. Particularly the latter finding did not support Hypothesis 1. Lone mother status was further not related to changes in psychological well-being or life satisfaction overall, which was contrary to Hypothesis 2.

In Model 2, we added interaction terms between lone mother status and levels of social support, as well as between lone mother status and parenting stress. For both outcome variables (i.e., psychological well-being and life satisfaction), the interactions between lone parent status and pre-pandemic conditions (i.e., parenting stress and social support) increased R² by only 0.002 (see Table 2), or an additional 0.2% of explained variance in the performance beyond the main effects. These effects are on the smaller side in absolute terms, which is not uncommon in social sciences (e.g., Van Iddekinge et al., 2021). Yet a relative increase in R² by about 10% ($=0.002/0.022 = 0.091$ for psychological well-being) based on the added interaction term only can be considered meaningful and relevant for the specific subgroups involved in the moderation effect. A significant interaction emerged between lone mother status and poor (vs. high) levels of pre-pandemic social support, which is illustrated in Figure 1. It can be seen that the predicted probabilities for change in psychological well-being did not differ by levels of social support among partnered mothers. Lone mothers with poor levels of pre-pandemic social support, however, reported less

severe declines in psychological well-being than those with high levels of social support in 2019. The interaction between lone mother status and parenting stress was not significant for psychological well-being (results available upon request).

Figure 1: Predicted probabilities for change in psychological well-being among lone and partnered mothers by levels of social support

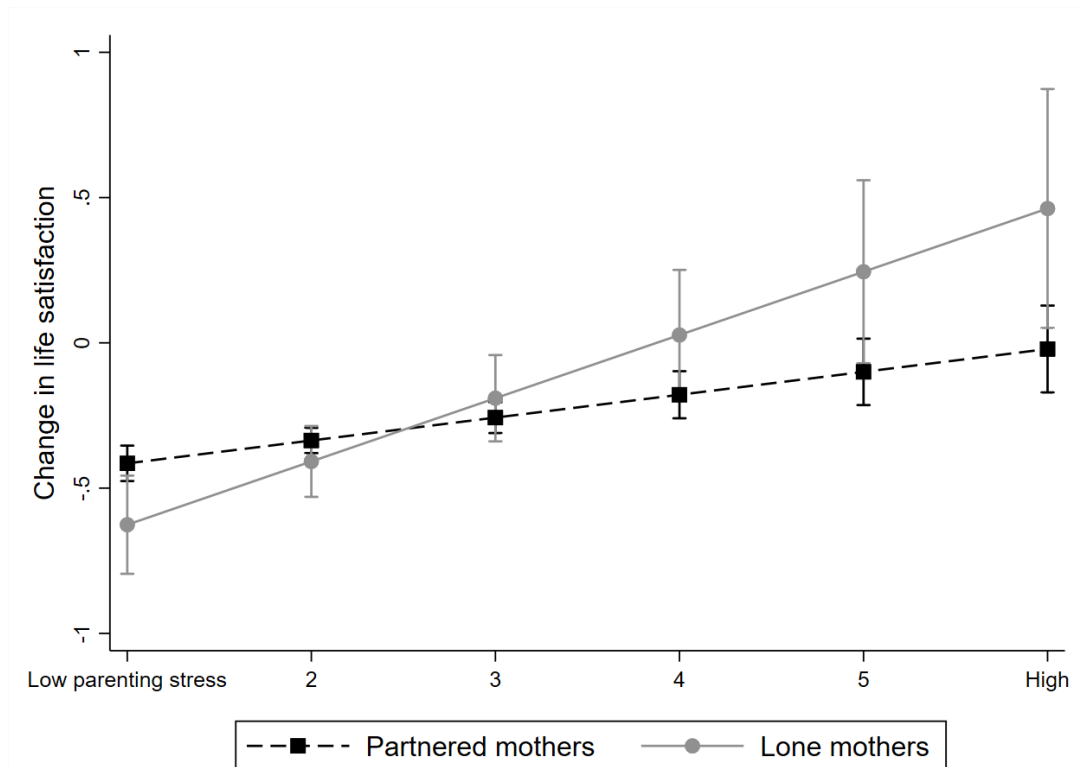


For life satisfaction, we found a significant interaction between lone mother status and parenting stress. This indicates that the positive link between levels of pre-pandemic parenting stress and change in life satisfaction was more pronounced among lone mothers (Figure 2). Or, if you look at it from a different perspective, the decline in life satisfaction was less pronounced among lone mothers with higher levels of pre-pandemic parenting stress compared to those lone mothers who experienced less parenting stress before the pandemic. In contrast, change in life satisfaction did not vary significantly by levels of parenting stress among partnered mothers. Both of these interaction findings support the role enhancement (Hypothesis 3b) rather than the role strain perspective (Hypothesis 3a) suggesting that the well-being of the least resourceful lone mothers was not as negatively affected.

7. Discussion

Our study examined whether and how pre-pandemic resources and stressors, namely one's SES, social support, and level of parenting stress (e.g., Nomaguchi & Milkie, 2020), affected change in mothers' well-being using representative German panel data collected before and during the COVID-19 pandemic. Because lone compared to partnered mothers were already more strained and tended to suffer from poorer mental health before the pandemic (e.g., Dziak, 2010; Cooper et al., 2009; Kühn, 2018; Parkes et al., 2015; Recksiedler et al., 2023), we probed differences by family structure and whether the link between pre-pandemic conditions and change in well-being varied between these groups.

Figure 2: Predicted probabilities for change in life satisfaction among lone and partnered mothers by levels of parenting stress



Previous studies have shown that mothers, who tended to shoulder a larger share of domestic and care work in families before the pandemic despite recent advances in paternal involvement (Schoppe-Sullivan & Fagan, 2020), were also more burdened by additional responsibilities during the pandemic (e.g., Hipp & Bünning, 2021; Möhring et al., 2021; Zoch et al., 2021). This has, in turn, increased mothers' level of perceived stress and affected their mental health detrimentally (Feinberg et al., 2021; Gniewosz, 2022; Li et al., 2021). This is in line with our descriptive findings showing a decrease in both maternal psychological well-being and general life satisfaction for all mothers from before to during the pandemic. Based on the model of risk and resilience in family well-being developed in light of the pandemic (Prime et al., 2020), we further expected the amount of pre-pandemic resources and the load of pre-pandemic stressors to be associated with change in maternal well-being during the pandemic. This hypothesis was partly confirmed for SES because higher levels of pre-pandemic educational attainment and income were associated with an increase in psychological well-being (McCubbin & Patterson, 1983), which is also in line with the social production function framework postulating that initial status differences (e.g., with regard to resource availability) determine how individuals strive to achieve or optimize well-being (Ormel et al., 1999). The positive link between higher levels of pre-pandemic parenting stress and change in both psychological well-being and life satisfaction could mean that mothers with higher levels of parenting stress before the pandemic were used to dealing with stressful situations already. It could also indicate that they established new routines to alleviate some role strain during the pandemic. For instance, some mothers were able to reduce their working hours or work remotely during the pandemic in response to the additional load of childcare duties during daycare and school closures (Hank & Steinbach, 2021; Möhring et al., 2021; Zerle-Elsäßer et al., 2022; Zoch et al., 2021). This, and a reduction of other (social) obligations during the pandemic, could have dampened declines in well-being among mothers with higher levels of pre-pandemic parenting stress. Similarly, mothers with medium (vs. high) levels of pre-pandemic social support could have coped better during the pandemic because they were already used to organizing their daily lives with a more reduced network.

In our second hypothesis, we expected lone compared to partnered mothers to experience a larger decrease in maternal well-being during the pandemic because of pre-existing disparities between these

groups related to the stress and strain associated with union dissolution in addition to the disruptions caused by the pandemic (e.g., Amato, 2010; Avison et al., 2007; Heintz-Martin & Langmeyer, 2020). Other studies showed that rates of psychological distress and mental illness did increase among lone mothers during the pandemic (Li et al., 2021; Mata et al., 2021; Taylor et al., 2022). Being a lone mother, however, was not significantly associated with changes in either psychological well-being or life satisfaction during the pandemic in our models. This is in line with evidence from a sample of U.S. adults showing that differences in self-rated health, depression, and anxiety between married and previously married individuals became smaller as the pandemic progressed (Thomeer, 2023). It is important to note that the latter group also included widowed individuals. Thomeer argues, however, that the pre-pandemic benefits associated with marriage, or romantic unions in general, could have faded during the pandemic because social isolation and more time spent at home with the partner may have caused greater marital strain (e.g., more conflicts or even incidences of domestic abuse in some unions; Kourti et al., 2023). Similar processes could be at play in our sample as well, while other reasons for the null effect in our models could be specific to the German context. For instance, Hiekel and Kühn (2022) speculate that differences in self-reported stress, exhaustion, and loneliness between lone and partnered mothers were less evident because lone parents were entitled to “emergency daycare” during earlier stages of the pandemic in Germany. This, and the fact that non-resident parents could visit their children in person and potentially take over childcare duties throughout the pandemic in Germany, if they were involved with the child, could have alleviated some role strain among lone mothers specifically. In turn, this may have benefited their mental health.

Third, we formulated two competing hypotheses on the role of pre-pandemic conditions, namely the amount of available resources and pre-existing stressors, on maternal well-being by family structure based on the role strain (e.g., Goode, 1960) and role enhancement perspective (Moen et al., 1995). Through the role strain lens, the additional social roles and care obligations during the pandemic should be most detrimental to the well-being of the least resourceful among the already more disadvantaged group of lone mothers. Yet the pattern of our results indicating two significant interaction effects between lone mother status and pre-pandemic social support for psychological well-being, and between lone mother status and pre-pandemic parenting stress for life satisfaction, did not support this argument (i.e., that the high load of pre-pandemic stressors and lack of resources would aggravate mental health differences between lone and partnered parents; e.g., Mata et al., 2021). Instead, those with poorer pre-pandemic social support and higher levels of parenting stress seemed to be dampened from declines in well-being during the pandemic among the group of lone mothers only. These findings can be interpreted in light of the role enhancement argument postulating that, depending on the context, taking on additional roles can offer gratification, power, prestige, or meaning (Moen et al., 1995). In our case, particularly the least resourceful lone mothers could have been spared from experiencing a decline in their well-being during the pandemic because they may have been able to adapt better and more quickly to the situation (e.g., fulfilling additional care roles in light of school and daycare closures, or a reduction in other external help), and that could have provided some level of emotional comfort or reward during a particularly stressful time. This is further in line with evidence regarding larger increases in the well-being of high-intensity family caregivers in Germany during an earlier phase of the pandemic in 2020 (Möhring et al., 2023).

Alternatively, approaches arguing that some impactful events (i.e., the pandemic) can serve as a leveler of the pre-existing social disparities of stratified life courses (Leopold & Leopold, 2016), as well as through “shift-and-persist” strategies employed by more vulnerable groups (e.g., Chen & Miller, 2012), can be utilized to explain these findings. More specifically, one could assume that lone mothers with less available pre-pandemic resources and a higher load of stressors would represent a particularly precarious group during the pandemic. If the pandemic served as a leveler of stratified life course, the more vulnerable group may have already experienced other stressors before the pandemic and could therefore have little room for further losses compared to their less strained counterparts (e.g., Leopold & Leopold, 2016). In other words, lone mothers with poorer pre-pandemic social support and higher parenting stress were already used to either shouldering most of their responsibilities or dealing with high-stress situations on their own. Being unable to receive help or support during the pandemic because of, for instance, social distancing may have therefore not affected these mothers compared to those lone mothers with stronger pre-pandemic social support networks. The latter group may have felt a stronger need to reassess their situation and reorganize their family life with less social support. Relatedly, more vulnerable lone mothers may have already adopted a set of established coping strategies for critical events (e.g., acceptance, reappraisal, or benefit finding) due

to the exposure to prior stressors, which then helped them weather the additional burden associated with the pandemic (Chen & Miller, 2012).

8. Limitations and conclusion

Our study has some limitations. First, our data comprised only two time points—one shortly before and one during the pandemic—that were two years apart. It could be the case that we underestimated change in well-being and differences by family structure because fluctuations occurred during those two years. Second and relatedly, data collection for the 2021 follow-up took place during the fall and winter months of that year. Even though case numbers spiked in these months again compared to summer, the vaccines were widely available, daycare centers and schools were mostly running again, free testing was available, and strict lockdowns were no longer in place (e.g., RKI, 2022). This could have contributed to an underestimation of the effects because the height of the pandemic had passed. Our findings are nevertheless in line with other studies that were conducted during different stages of the pandemic (e.g., Thomeer, 2023). Third, we are aware of some degree of selectivity in our sample because mothers with a higher SES were more likely to have participated in the 2021 follow-up. Even though this is important to keep in mind, it is largely in line with attrition patterns observed in other surveys conducted during the pandemic (Biddle et al., 2023). Yet in contrast to other studies that were launched during the pandemic and based on convenience samples, our data stem from a representative survey that started in 2019. The sample selectivity could have, if anything, led to an underestimation of our effects as well. Yet again, the pattern of results is largely in line with other national and international studies (e.g., Hiekel & Kühn, 2022; Möhring et al., 2023; Thomeer, 2023). Lastly, we were not able to test whether pandemic-specific policies for lone parents (e.g., emergency care or support from the non-resident father) had an impact on maternal well-being due to data limitation issues.

Despite these limitations, we conclude that the amount of available pre-pandemic resources and the load of pre-pandemic stressors—particularly SES and partly social support—played a key role in shaping how mothers fared during stressful times, such as the pandemic. Lone mother status was not per se associated with a greater decrease in maternal well-being during the pandemic despite the chronic and proliferated strain lone mothers face in multiple life domains compared to their partnered counterparts. This could in part be explained by the institutional safety net provided for lone mothers and increased marital or relationship strain during the pandemic. Yet lone mothers who were more strained before the pandemic even seemed to have been buffered from more severe declines in their well-being, which we interpreted using the role enhancement perspective and other approaches arguing that some impactful events can serve as a leveler of the pre-existing social disparities of stratified life courses. The use of “shift-and-persist” strategies by more vulnerable groups may have also dampened pandemic-related effects on the well-being of the least resourceful lone mothers. Whether these patterns of results can be replicated in other contexts, in the long run after the immediate effects of the pandemic, or under different circumstances (i.e., families facing other crises, such as high inflation), could be an interesting avenue for future research.

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Data availability statement

The data used in this study are available for scientific use at the Research Data Center of the German Youth Institute (<https://doi.org/10.17621/aida2019>, and <https://doi.org/10.17621/aida2021>).

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Information in German

Deutscher Titel

Veränderungen im mütterlichen Wohlbefinden während der COVID-19-Pandemie in Deutschland: Haben vorpandemische soziale Unterstützung und Erziehungsstress Unterschiede im Wohlbefinden von alleinerziehenden Müttern und Müttern in Paarhaushalten während der Pandemie abgeschwächt oder verstärkt?

Zusammenfassung

Fragestellung: Die Studie hat das Ziel, Veränderungen des Wohlbefindens von alleinerziehenden Müttern und Müttern in Paarhaushalten während der COVID-19 Pandemie zu untersuchen und den Einfluss von vorpandemischen Bedingungen zu prüfen.

Hintergrund: Vor dem Hintergrund der vielfältigen Herausforderungen für Familien während der COVID-19 Pandemie, berichten insbesondere Mütter von vermehrten psychischen Belastungen. Diese sind auch auf die erhöhten Anforderungen von Betreuungsaufgaben zurückzuführen, die vor allem Mütter durch pandemiebedingte Schließungen von Schul- und Kinderbetreuungseinrichtungen übernehmen mussten. Bisherige Befunde zu den Auswirkungen der Pandemie auf das Wohlbefinden von alleinerziehenden Müttern im Vergleich zu Müttern in Paarfamilien sind jedoch uneinheitlich.

Methode: Zur Beantwortung der Fragestellung werden Längsschnittdaten einer Zufallsstichprobe herangezogen, die vor und während der COVID-19 Pandemie erhoben wurden. Mit den vorliegenden Daten ist es möglich, Veränderungen des mütterlichen Wohlbefindens (d.h. subjektives psychologisches Wohlbefinden und allgemeine Lebenszufriedenheit) für Alleinerziehende und Mütter in Paarhaushalten zu untersuchen (N = 3.578; 14,3% alleinerziehende Mütter zu Beginn der Studie).

Ergebnisse: Die Veränderung des mütterlichen Wohlbefindens stand in einem positiven Zusammenhang mit dem sozioökonomischen Status, wenngleich es keine Unterschiede zwischen Alleinerziehenden und Müttern in Paarhaushalten gab. In Hinblick auf die Rolle von vorpandemischer sozialer Unterstützung und Erziehungsstress zeigten die Ergebnisse, dass diese Faktoren keinen Einfluss auf die Veränderung des Wohlbefindens von Müttern in Paarhaushalten hatten. Für alleinerziehende Mütter hingegen trugen diese Faktoren dazu bei, dass sich deren Wohlbefinden in der Pandemie weniger stark verringerte.

Schlussfolgerung: Fehlende Unterschiede zwischen alleinerziehenden Müttern und Müttern in Paarhaushalten könnten darauf zurückzuführen sein, dass während der Pandemie institutionelle Sicherheitsnetze für alleinerziehende Mütter geschaffen wurden und Paarbeziehungen mitunter stärker belastet waren.

Schlagwörter: psychologisches Wohlbefinden, Lebenszufriedenheit, psychische Gesundheit, Familienstruktur, Alleinerziehende, COVID-19-Pandemie

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