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A Research Note on the Cohabitation Gradient in Parents' Childcare Time in Germany

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Abstract

We examined differences in time use for primary childcare between non-cohabiting and cohabiting mothers and fathers in Germany between 1991/92 and 2022. Facing the task of balancing paid and unpaid work on their own, non-cohabiting parents face different demands and time binds in allocating time for childcare compared to cohabiting parents. Current evidence how this translates into different patterns of time use for childcare is mixed and nonexistent for Germany. We applied OLS regression to estimate non-cohabiting (n=968) and cohabiting (4,486) mothers' and fathers' (n=76 and n=4,416, respectively) time use for primary childcare using time diary data of the four surveys of the German Time Use Study from 1991/1992, 2001/2002, 2012/2013, and 2022 (n=10,202 diaries for mothers, and n=8,388 diaries for fathers). After controlling for compositional differences, non-cohabiting mothers' time use on primary childcare did not substantially differ from that of cohabiting mothers in either survey wave. Non-cohabiting fathers spent more time doing primary childcare than cohabiting fathers, although this finding rested on very small case numbers. Taken together, non-cohabiting mothers did not seem to reduce their time for childcare when compared to cohabiting mothers, whereas non-cohabiting fathers seemed to meet the need of more childcare, compared to cohabiting fathers.

Keywords: family dynamics; gender inequality; time use; unpaid work.

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1 Introduction

Gender inequalities in time use are manifold and the debate about how women and men spend their time differently is vivid. Today, there is prevailing evidence that the development of these gender inequalities follows a pattern of convergence and continuity over time, cohorts, and the life course (Leopold et al., 2018; Sullivan et al., 2018). In life-course and family research, especially the gender gap in work times has been subject of intense debate. Ample research acknowledged that women and men, as well as mothers and fathers, have become somewhat more equal over recent decades but still have not overcome the traditional gendered division of labor, first and foremost concerning unpaid work (Pailhé et al., 2021; Sullivan et al., 2018).

Childcare time is a prime application to fuel this debate. In many western countries, “parents have undergone a behavioral change that has more than countered family change that might otherwise have reduced time with children” (Sayer, Bianchi, et al., 2004, p. 1). Most notably did the spread of intensive parenting norms (Altintas, 2016) elicit both mothers and fathers to increase their time spent for and with children over the last decades, particularly on developmental and “fun activities” (Sayer, Bianchi, et al., 2004; Steinbach & Schulz, 2022). Hardly surprising, these changes in childcare time were found to be socially stratified, supporting the notion of a positive education gradient (Dotti Sani & Treas, 2016; Sayer, Gauthier, et al., 2004; Schulz & Engelhardt, 2017).

The present research note tackles another possible source of stratification of childcare time, i.e., by parents' cohabitation status. Current empirical evidence about the direction and the scope of the *cohabitation gradient* for mothers in different contexts and based on different empirical settings and methodological choices (e.g., the age ranges of children included in the studies), has been mixed, though, and this was the case between but also within countries. Several studies did not report any, or at least only minimal differences in non-cohabiting and cohabiting mothers' time use for childcare in Denmark, France, Spain, Italy, Australia and the United States (Craig & Mullen, 2012; García-Saladrigas, 2017; Pepin et al., 2018), at least after controlling for socio-economic characteristics (Kendig & Bianchi, 2008; Pepin et al., 2018). Other studies found a negative cohabitation gradient, i.e., that cohabiting mothers spent less time on childcare in Australia, the United Kingdom and the United States (Kalenkoski et al., 2005, 2007; Le & Miller, 2013). To cover the spectrum, a third set of studies documented a positive cohabitation gradient, i.e., cohabiting mothers spent more time on childcare in the United States (Craig & Mullen, 2012) and Japan (based on a categorized time use measure only; Raymo et al., 2014).

For fathers, there is much less evidence available, which is also based on much smaller samples, and not statistically significant in each case. However, studies covering fathers reported that non-cohabiting fathers spent more time on childcare than cohabiting fathers in the United Kingdom, the United States (Kalenkoski et al., 2005, 2007) and the Netherlands (albeit based on a frequency measure only; Koster & Castro-Martín, 2021), i.e., a negative cohabitation gradient.

Our research note contributes to this situation of mixed findings by adding evidence for mothers and fathers living in Germany, which is still considered a rather “familialistic” regime (Leitner, 2003), with an at least moderate separate spheres family model as well as prevailing

traditional gender ideologies and gendered behavior in the family (Leopold et al., 2018; Steinbach & Schulz, 2022). In particular, the comparison of non-cohabiting and cohabiting fathers sheds more light on a question that has not been studied much as of now and our data allow us to assess whether the cohabitation gradient might have changed over the course of thirty years.

Dealing with the task of balancing paid and unpaid work on their own, non-cohabiting parents face different demands and time binds in allocating time for childcare compared to cohabiting parents, who may, at least theoretically, benefit from the opportunity of within couple sharing (Craig & Mullen, 2012; Kalenkoski et al., 2005; Pepin et al., 2018). Therefore, time use for childcare should be more responsive to competing needs in non-cohabiting parent households. On the one hand, non-cohabiting mothers' or fathers' childcare time may be higher than cohabiting mothers' or fathers' because they need to take up full responsibility for their children alone, without the possible assistance of a partner in the household. On the other hand, non-cohabiting mothers' or fathers' childcare time may be lower than cohabiting mothers' or fathers' because of lower time availability due to other commitments, for example on the labor market. Overall, mothers are expected to spend more time on childcare than fathers, reflecting predictions of the gender perspective against the background of the rather traditional gender role context in Germany (Steinbach & Schulz, 2022). Our empirical analyses of mothers' and fathers' primary childcare time using data from the German Time Use Study will determine which of the theoretically inconclusive scenarios is backed by the data.

2 Data and Methods

We used data from the scientific use files of the four cross-sectional surveys of the German Time Use Study, which were conducted in 1991/1992 (Ehling, 1999), 2001/2002 (Ehling et al., 2001), 2012/2013 (Maier, 2014), and 2022 (Statistisches Bundesamt, 2024) by the German Federal Statistical Office. These surveys were based on quota samples of around 7,200, 5,000, 5,000, and 10,000 households, respectively. Time use data was collected with first-hand time diaries for each respondent, two diaries in 1991/1992, and three diaries in 2001/2002, 2012/2013, and 2022. To be comparable over the years, all activities were coded according to the 2008 Guidelines for Harmonized European Time Use Surveys (Ehling et al., 2001; Maier, 2014; Statistisches Bundesamt, 2024). In general, time diaries are regarded as a valid approach for measuring time use (Gershuny et al., 2020), and there is evidence that particularly childcare time is captured in much greater detail in diary studies, and should be less prone to over-reporting and social desirability bias than in other population surveys (Hofferth, 2006).

The present research note focused on primary childcare time of mothers and fathers (aged 19-59 years) who were co-residing with their children, all of whom were under the age of 13. We restricted the sample to children of this age to maintain comparability with previous studies (Dotti Sani & Treas, 2016; Pepin et al., 2018) and because childcare of parents whose children are older than this is characterized by less care work and would thus be less comparable. Cohabiting parents were kept in the sample, if they lived in a household with another heterosexual adult. Therefore, our two groups of comparison were adults living with another adult of a different gender (cohabiting) and adults living with no other adult (non-cohabiting). We furthermore restricted our sample to diaries from weekdays. Whereas the information on the household composition allows us to reliably capture information on childcare during the regular work week, hence in the 'everyday care situation', we cannot

reliably assess our research question for weekends, since we assume that there may be considerable variation in care constellations for weekends among non-cohabiting parents. Further, households with “other persons”, or with older children were dropped to reduce heterogeneity.

The final estimation sample comprised 5,454 mothers, who reported 10,202 diaries over all four surveys (Table 1), and 4,492 fathers with 8,388 diaries (Table 2). To maximize comparability, data preparation followed earlier studies on childcare time with the German Time Use Study (Schulz & Engelhardt, 2017; Steinbach & Schulz, 2022), as well as previous studies tackling cohabitation differences in childcare time, (Kalenkoski et al., 2005; Pepin et al., 2018) as close as possible.

For our dependent variable, we summarized mothers' and fathers' childcare time from six different categories: (1) engaging in helping, teaching, and learning activities with children; (2) playing with children; (3) doing basic childcare, such as feeding, changing diapers, or ensuring daily hygiene; (4) talking with children; (5) managing activities for children; and (6) reading to and with children, and telling them stories. We focused on respondents' diary entries of primary activities only, because we were interested in active childcare rather than a broader picture including patterns of co-presence, and because we assumed that main activities are more efficient in capturing comparable time budgets in different surveys (Kitterød, 2001).

Our main independent variable was the cohabitation status of mothers and fathers: a dummy variable indicated if a person was living in a joint household with a partner of a different gender. As expected, households with non-cohabiting parents were much rarer in our sample than couple households: 18.3% non-cohabiting mother households and 2.1% non-cohabiting father households in our sample which includes only households with children aged up to 12 years. In comparison, in the whole German population, including households with underage children of any age, 17.9% non-cohabiting mother households and 2.1% non-cohabiting father households were observed in 2013, and 16.0% and 2.9% in 2022, respectively (Federal Institute for Population Research, 2025). Thus, estimates for non-cohabiting fathers' time use yielded very large confidence intervals. Still, we kept these cases and interpreted the tendencies of the findings with great caution.

Table 1 Sample descriptives of mothers, by survey year

	All mothers		1991/1992		2001/2002		2012/2013		2022	
	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting
Households	4,486	968	1,276	228	828	202	707	159	1,675	379
Persons	4,486	968	1,276	228	828	202	707	159	1,675	379
Diaries (Mon through Fri)	8,391	1,811	2,183	378	1,606	394	1,380	308	3,222	731
Primary childcare time ^a	140.45 (125.34)	108.80 (106.89)	114.59 (96.41)	101.67 (86.55)	111.82 (103.06)	83.20 (91.08)	122.88 (108.27)	89.48 (94.86)	179.76 (147.55)	134.42 (122.54)
Age	35.85 (5.50)	37.45 (6.56)	33.44 (5.06)	33.62 (5.93)	36.14 (4.85)	37.10 (5.58)	37.43 (5.83)	40.01 (6.83)	36.88 (5.38)	38.87 (6.26)
Highest school-leaving qualification: Lower secondary	0.11	0.14	0.20	0.24	0.14	0.15	0.08	0.13	0.03	0.07
Mid secondary	0.36	0.35	0.50	0.43	0.43	0.43	0.36	0.38	0.22	0.25
Upper secondary	0.53	0.51	0.30	0.33	0.43	0.42	0.56	0.49	0.75	0.68
Tertiary degree: Yes	0.61	0.65	0.18	0.17	0.22	0.24	0.46	0.42	0.60	0.49
No	0.39	0.35	0.82	0.83	0.78	0.76	0.54	0.58	0.40	0.51
Number of children in the household	1.82 (0.76)	1.41 (0.66)	1.96 (0.83)	1.49 (0.74)	1.86 (0.74)	1.45 (0.61)	1.74 (0.69)	1.28 (0.53)	1.72 (0.72)	1.41 (0.68)
Child aged 0–2 in the household: Yes	0.35	0.15	0.34	0.21	0.27	0.12	0.30	0.07	0.41	0.16
No	0.65	0.85	0.66	0.79	0.73	0.88	0.70	0.93	0.59	0.84
Child aged 3–5 in the household: Yes	0.44	0.25	0.49	0.31	0.41	0.20	0.39	0.16	0.43	0.28
No	0.56	0.75	0.51	0.69	0.59	0.80	0.61	0.84	0.57	0.72
Child aged 6–9 in the household: Yes	0.51	0.49	0.55	0.48	0.55	0.47	0.50	0.49	0.45	0.51
No	0.49	0.51	0.45	0.52	0.45	0.53	0.50	0.51	0.55	0.49
Child aged 10–12 in the household: Yes	0.29	0.38	0.31	0.32	0.37	0.49	0.35	0.45	0.22	0.33
No	0.71	0.62	0.69	0.68	0.63	0.51	0.65	0.55	0.78	0.67
Employment: Full-time	0.21	0.26	0.22	0.38	0.11	0.24	0.14	0.21	0.27	0.23
Part-time	0.52	0.48	0.42	0.34	0.53	0.50	0.49	0.45	0.61	0.56

	All mothers		1991/1992		2001/2002		2012/2013		2022	
	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting
Not employed	0.27	0.26	0.36	0.28	0.36	0.27	0.38	0.33	0.12	0.21
Household income: < 1,000 EUR	0.01	0.20	0.03	0.51	0.01	0.17	0.01	0.19	0.00	0.05
1,000 < 1,250 EUR	0.02	0.14	0.03	0.16	0.01	0.22	0.01	0.21	0.01	0.05
1,250 < 1,500 EUR	0.06	0.14	0.19	0.22	0.04	0.19	0.02	0.13	0.00	0.07
1,500 < 2,500 EUR	0.26	0.35	0.54	0.09	0.37	0.37	0.21	0.34	0.05	0.48
2,500 < 3,750 EUR	0.24	0.14	0.18	0.01	0.43	0.05	0.31	0.11	0.17	0.26
3,750 < 5,000 EUR	0.21	0.04	0.02	0.00	0.10	0.00	0.30	0.01	0.35	0.09
5,000 EUR +	0.19	0.00	0.01	0.00	0.04	0.00	0.14	0.01	0.42	0.01
Region: West Germany	0.80	0.77	0.75	0.84	0.87	0.83	0.79	0.74	0.81	0.73
East Germany	0.20	0.23	0.25	0.16	0.13	0.17	0.21	0.26	0.19	0.27

Notes: ^a Based on diaries. Case numbers, proportions, means, standard deviations in parentheses (if applicable); rounding differences to one may apply. German Time Use Study, 1991/1992, 2001/2002, 2012/2013, 2022, own calculations.

Table 2 Sample descriptives of fathers, by survey year

	All fathers		1991/1992		2001/2002		2012/2013		2022	
	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting
Households	4,416	76	1,270	21	829	5	688	15	1,629	35
Persons	4,416	76	1,270	21	829	5	688	15	1,629	35
Diaries (Mon through Fri)	8,249	139	2,173	34	1,608	9	1,337	28	3,131	68
Primary childcare time ^a	60.49 (80.47)	77.27 (87.79)	34.95 (48.32)	72.94 (83.21)	40.56 (54.39)	54.44 (41.26)	47.28 (59.64)	55.36 (67.41)	94.09 (102.69)	91.47 (99.72)
Age	38.57 (6.19)	40.70 (7.24)	36.36 (5.89)	37.48 (7.59)	38.74 (5.45)	47.80 (3.70)	40.57 (6.33)	42.60 (5.25)	39.37 (6.22)	40.80 (7.30)
Highest school-leaving qualification: Lower secondary	0.20	0.05	0.33	0.14	0.26	0.00	0.17	0.00	0.09	0.03
Mid secondary	0.28	0.29	0.33	0.33	0.30	0.20	0.32	0.47	0.22	0.20
Upper secondary	0.51	0.66	0.34	0.52	0.44	0.80	0.50	0.53	0.69	0.77
Tertiary degree: Yes	0.45	0.53	0.26	0.29	0.35	0.80	0.53	0.40	0.63	0.69
No	0.55	0.47	0.74	0.71	0.65	0.20	0.47	0.60	0.37	0.31

	All fathers		1991/1992		2001/2002		2012/2013		2022	
	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting	Cohabiting	Not cohabiting
Number of children in the household	1.81 (0.76)	1.33 (0.55)	1.95 (0.82)	1.38 (0.67)	1.86 (0.75)	1.40 (0.55)	1.74 (0.68)	1.27 (0.59)	1.70 (0.72)	1.31 (0.47)
Child aged 0–2 in the household: Yes	0.35	0.05	0.34	0.05	0.28	0.00	0.30	0.00	0.42	0.09
No	0.65	0.95	0.66	0.95	0.72	1.00	0.70	1.00	0.58	0.91
Child aged 3–5 in the household: Yes	0.43	0.28	0.49	0.33	0.41	0.00	0.39	0.27	0.42	0.29
No	0.57	0.72	0.51	0.67	0.59	1.00	0.61	0.73	0.58	0.71
Child aged 6–9 in the household: Yes	0.50	0.47	0.55	0.48	0.55	0.40	0.50	0.47	0.44	0.49
No	0.50	0.53	0.45	0.52	0.45	0.60	0.50	0.53	0.56	0.51
Child aged 10–12 in the household: Yes	0.29	0.42	0.31	0.38	0.37	0.80	0.34	0.47	0.22	0.37
No	0.71	0.58	0.69	0.62	0.63	0.20	0.66	0.53	0.78	0.63
Employment: Full-time	0.88	0.67	0.93	0.71	0.90	0.60	0.86	0.67	0.85	0.66
Part-time	0.06	0.20	0.02	0.14	0.04	0.40	0.05	0.07	0.10	0.26
Not employed	0.06	0.13	0.05	0.14	0.06	0.00	0.09	0.27	0.04	0.09
Household income: < 1,000 EUR	0.01	0.10	0.03	0.32	0.01	0.00	0.01	0.00	0.00	0.03
1,000 < 1,250 EUR	0.01	0.07	0.03	0.16	0.01	0.00	0.01	0.13	0.00	0.00
1,250 < 1,500 EUR	0.06	0.14	0.19	0.21	0.04	0.00	0.02	0.20	0.00	0.09
1,500 < 2,500 EUR	0.26	0.36	0.54	0.26	0.37	0.25	0.21	0.53	0.04	0.34
2,500 < 3,750 EUR	0.24	0.18	0.18	0.05	0.43	0.75	0.31	0.13	0.17	0.20
3,750 < 5,000 EUR	0.21	0.10	0.02	0.00	0.10	0.00	0.31	0.00	0.35	0.20
5,000 EUR +	0.20	0.07	0.01	0.00	0.04	0.00	0.14	0.00	0.43	0.14
Region: West Germany	0.80	0.78	0.75	0.86	0.87	1.00	0.79	0.67	0.81	0.74
East Germany	0.20	0.22	0.25	0.14	0.13	0.00	0.21	0.33	0.19	0.26

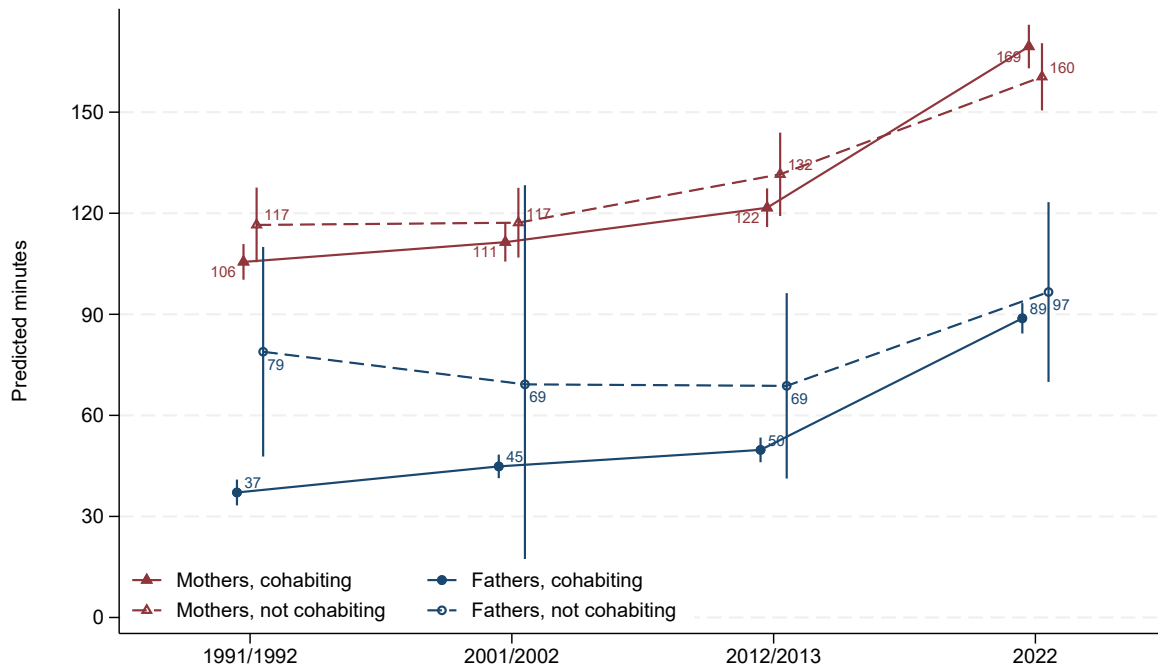
Notes: ^a Based on diaries. Case numbers, proportions, means, standard deviations in parentheses (if applicable); rounding differences to one may apply. German Time Use Study, 1991/1992, 2001/2002, 2012/2013, 2022, own calculations.

We estimated several OLS regression models, starting with the cohabitation variable only. The following multivariate analysis included several controls known to be associated with variations in childcare time (Tables 3, 4): age; education (highest school-leaving qualification plus university degree vs. no university degree); employment (full-time, part-time, not employed); household income, not least as an indicator of social status (< 1,000 EUR, 1,000 < 1,250 EUR, 1,250 < 1,500 EUR, 1,500 < 2,500 EUR, 2,500 < 3,750 EUR, 3,750 < 5,000 EUR, 5,000 EUR +); number of children in the household; dummy variables indicating that children in different age ranges (0–2, 3–5, 6–9, 10–12) lived in the households; region (East vs. West Germany); and survey year (1991/1992, 2001/2002, 2012/2013, 2022). Eventually, we included a model with an interaction of cohabitation status and survey year to assess possible changes in the cohabitation gradient. We estimated separate models for mothers and fathers throughout, as the well-known gender differences in childcare time are undisputed in the current literature. We further estimated clustered standard errors to take into account that each respondent may have kept multiple diaries on weekdays.

3 Results

Tables 3 and 4 show the results of our stepwise OLS estimation of the cohabitation gradient in primary childcare time for weekdays for mothers and fathers, respectively. Figure 1 additionally illustrates the development of non-cohabiting and cohabiting parents' average minutes of childcare time over the four survey waves, predicting the time budgets for each year and cohabitation status based on our interaction models.

For mothers, the simple models without covariates (models 1.1, 2.1, 3.1, 4.1, 5.1 in Tables 3, 4) show that there was a substantial positive cohabitation coefficient. In 1991/1992, cohabiting mothers spent around 13 minutes more on primary childcare than non-cohabiting mothers, and this difference increased to around 45 minutes in 2022. When adding covariates, this effect became substantially smaller and ceased to be statistically significant in all waves – in 2012/13, there is even a negative cohabitation coefficient, after accounting for compositional differences. In the interaction model (1.3), this coefficient is however quite small and not statistically significant. Thus, while cohabiting mothers also spent substantially more time on childcare than non-cohabiting mothers in all survey years, this difference is entirely due to compositional differences between the groups. Specifically, Table 1 shows that the share of cohabiting mothers with children aged 0–2 was much larger than the share of non-cohabiting mothers in that age group. Since mothers of children in that age spent considerably more time on childcare than mothers of older children, it accounts for a large part of the difference between our models.

Figure 1 Time use of cohabiting and non-cohabiting mothers and fathers for primary childcare on weekdays (Mon through Fri)

Note: Predicted average minutes of primary childcare per day, and 95%-confidence intervals. Minutes were calculated from the regression models 1.3 in Tables 3, 4 as margins at the means, which were adjusted by setting all covariates to the sample means. German Time Use Study, 1991/1992, 2001/2002, 2012/2013, 2022, own calculations.

For fathers, the negative cohabitation gradient for weekdays turned out to be substantially higher than for mothers. After controlling for compositional differences, cohabiting fathers spent around 42 minutes less on childcare than non-cohabiting fathers in 1991/1992, and this gradient decreased steadily up to around 8 minutes in 2022. The decrease of the cohabitation coefficient over time can largely be attributed to the fact that cohabiting fathers spent more than twice as much time on primary childcare in 2022 compared to 1992/1992. Regarding the differences between our bivariate and our full models, a pattern similar to the one for mothers is visible. In the full models, the cohabitation coefficient is either about equal to or smaller (i.e., more negative) than in the bivariate models. This, too, is due to cohabiting fathers having on average younger, more care-intensive children than non-cohabiting fathers (Table 2). Acknowledging the very small number of non-cohabiting father households in the German Time Use Study, especially in 2001/2002, the scope of the coefficient for fathers must be interpreted with great caution. This precludes strong claims about change over time, as the interaction coefficients were not statistically significant, with the exception of the 1991/1992 wave.

Table 3 OLS regression of mothers' time use for primary childcare on weekdays (Mondays through Fridays)

	All surveys			1991/1992		2001/2002		2012/2013		2022	
	(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(3.1)	(3.2)	(4.1)	(4.2)	(5.1)	(5.2)
<i>Cohabiting, i.e., couple household^a</i>	31.65*** (3.64)	-0.83 (4.06)	-10.97+ (5.78)	12.92* (6.01)	3.46 (6.45)	28.62*** (6.87)	2.19 (7.23)	33.40*** (7.54)	-18.82* (8.58)	45.34*** (6.63)	1.93 (8.37)
<i>Age</i>		-0.44 (0.27)	-0.43 (0.27)		0.27 (0.46)		-0.70 (0.59)		-0.58 (0.53)		-0.26 (0.51)
<i>Highest school-leaving qualification^b</i>											
Lower secondary		-3.81 (4.02)	-3.68 (4.02)		-5.92 (5.20)		-2.08 (8.50)		-11.19 (9.13)		-1.05 (12.25)
Upper secondary		3.10 (3.34)	3.17 (3.34)		-4.15 (6.02)		9.48+ (5.68)		0.16 (5.87)		10.87 (7.03)
<i>University degree^c</i>		2.85 (3.51)	2.95 (3.51)		-2.64 (6.88)		6.13 (7.22)		6.27 (5.74)		-1.74 (6.14)
<i>Presence of child aged 0–2^d</i>		100.70*** (4.46)	100.51*** (4.46)		82.47*** (6.48)		86.87*** (8.85)		92.55*** (9.88)		115.75*** (8.75)
<i>Presence of child aged 3–5^d</i>		6.13 (3.83)	6.31+ (3.83)		2.13 (6.07)		2.35 (7.34)		10.80 (8.76)		11.71 (7.36)
<i>Presence of child aged 6–9^d</i>		-14.61*** (3.81)	-14.45*** (3.81)		-11.81+ (6.23)		-13.74* (6.99)		-3.21 (8.61)		-19.10* (7.43)
<i>Presence of child aged 10–12^d</i>		-37.28*** (3.81)	-37.26*** (3.82)		-32.90*** (6.23)		-25.63*** (6.70)		-25.60** (9.20)		-54.83*** (7.57)
<i>Number of children in the household</i>		21.36*** (2.86)	21.33*** (2.86)		18.17*** (4.22)		17.40** (5.29)		20.46** (7.20)		27.36*** (5.52)
<i>Employment^e</i>											-15.57+ (8.15)
Part-time		-27.94*** (3.19)	-28.51*** (3.21)		-26.20*** (5.01)		-33.59*** (5.50)		-48.37*** (6.66)		-16.89+ (9.51)
Full-time		-35.00*** (4.26)	-36.05*** (4.30)		-42.55*** (5.93)		-50.02*** (8.71)		-62.82*** (7.90)		
<i>Household income^f</i>											
< 1,000 EUR		13.33* (6.28)	7.59 (6.52)		24.17** (8.57)		9.19 (13.75)		-20.50 (12.89)		20.26 (26.43)
1,000 < 1,250 EUR		3.62 (6.15)	-0.35 (6.12)		19.40* (9.81)		8.75 (11.44)		-13.16 (13.98)		-31.47* (15.53)

	All surveys			1991/1992		2001/2002		2012/2013		2022	
	(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(3.1)	(3.2)	(4.1)	(4.2)	(5.1)	(5.2)
1,250 < 1,500 EUR		0.40	-1.31		7.16		0.91		-1.91		-15.65
		(4.53)	(4.58)		(5.73)		(10.47)		(14.51)		(18.30)
2,500 < 3,750 EUR		5.26	4.80		7.16		0.41		11.61		-1.89
		(3.53)	(3.58)		(5.66)		(5.59)		(7.94)		(9.51)
3,750 < 5,000 EUR		5.01	3.06		-8.37		0.68		7.36		-5.08
		(4.66)	(4.83)		(12.63)		(8.03)		(8.05)		(10.34)
5,000 EUR +		-1.00	-3.93		-22.01+		21.74		-4.30		-11.90
		(5.71)	(5.98)		(11.68)		(15.96)		(9.56)		(11.41)
East Germany ^g		-14.31***	-13.57***		-16.11**		-4.17		-1.76		-19.30***
		(3.30)	(3.32)		(5.73)		(8.10)		(6.34)		(5.59)
Survey year ^h											
2001/2002		5.58+	0.66								
		(3.38)	(6.55)								
2012/2013		16.08***	15.02*								
		(3.82)	(7.50)								
2022		59.90***	43.96***								
		(4.36)	(7.16)								
Interaction: Cohabiting * Survey year ⁱ											
Cohabiting=yes * 2001/2002			5.19								
			(7.40)								
Cohabiting=yes * 2012/2013			1.04								
			(8.32)								
Cohabiting=yes * 2022			19.96*								
			(8.14)								
Constant	108.80***	92.06***	101.85***		77.61***	83.20***	112.65***	89.48***	132.45***	134.42***	125.95***
	(3.19)	(11.76)	(12.19)		(20.01)	(6.04)	(25.32)	(6.53)	(24.63)	(5.74)	(21.70)
Respondents	5453	5234	5234	1503	1348	1029	965	865	865	2053	2053
Diaries	10202	9818	9818	2561	2301	2000	1876	1688	1688	3953	3953
R squared	0.01	0.34	0.34	0.00	0.37	0.01	0.33	0.01	0.37	0.01	0.28

Notes: Reference categories: ^a Not cohabiting, i.e., single-parent household, ^b Mid secondary education, ^c (Lower) secondary education, ^d No child in this age range present, ^e Not employed, ^f 1,500 < 2,500 EUR, ^g West Germany, ^h 1991/1992, ⁱ Cohabiting=yes * 1991/1992. Unstandardized B-coefficients, clustered standard errors in parentheses, levels of significance: *** p<.001, ** p<.01, * p<.05, + p <.1 (two-tailed). German Time Use Study, 1991/1992, 2001/2002, 2012/2013, 2022, own calculations.

Table 4 OLS regression of fathers' time use for primary childcare on weekdays (Mondays through Fridays)

	All surveys			1991/1992		2001/2002		2012/2013		2022	
	(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(3.1)	(3.2)	(4.1)	(4.2)	(5.1)	(5.2)
<i>Cohabiting, i.e., couple household^a</i>	-16.78+	-18.73*	-41.78**	-37.99*	-37.07*	-13.88	-12.17	-8.08	-18.02	2.62	-13.70
	(9.11)	(8.61)	(15.82)	(15.95)	(14.94)	(14.07)	(25.84)	(16.52)	(14.27)	(14.84)	(12.52)
<i>Age</i>		-0.28	-0.28		-0.02		0.26		-0.80*		-0.02
		(0.19)	(0.19)		(0.25)		(0.30)		(0.35)		(0.39)
<i>Highest school-leaving qualification^b</i>											
Lower secondary		-1.17	-1.04		-2.86		-4.51		-8.92+		3.54
		(2.68)	(2.68)		(3.27)		(4.35)		(5.18)		(8.06)
Upper secondary		2.59	2.61		-5.89		3.03		2.91		3.90
		(2.96)	(2.96)		(4.87)		(4.20)		(4.98)		(5.74)
<i>University degree^b</i>		4.85+	4.95+		6.65		6.89		-1.94		6.88
		(2.82)	(2.83)		(4.91)		(4.38)		(4.64)		(4.97)
<i>Presence of child aged 0–2^c</i>		31.72***	31.70***		15.26***		35.30***		22.51***		45.71***
		(3.28)	(3.28)		(3.52)		(5.28)		(6.18)		(7.47)
<i>Presence of child aged 3–5^c</i>		7.03*	7.09*		3.14		9.93*		-3.95		16.51*
		(2.99)	(2.99)		(3.68)		(4.40)		(5.77)		(6.65)
<i>Presence of child aged 6–9^c</i>		-6.00*	-5.95*		-4.45		-3.31		-4.14		-7.03
		(3.02)	(3.02)		(4.11)		(3.69)		(5.43)		(6.93)
<i>Presence of child aged 10–12^c</i>		-21.29***	-21.30***		-11.24**		-8.77*		-22.43***		-35.97***
		(2.89)	(2.89)		(3.66)		(4.11)		(5.28)		(6.67)
<i>Number of children in the household</i>		7.55***	7.57***		4.31+		1.11		9.04*		12.55*
		(2.12)	(2.12)		(2.39)		(3.05)		(4.15)		(4.97)
<i>Employment^d</i>											
Part-time		-2.47	-2.48		-19.21		4.73		-21.47+		-8.96
		(8.03)	(8.04)		(12.78)		(12.90)		(11.47)		(17.43)
Full-time		-42.12***	-42.14***		-26.54**		-24.93**		-41.25***		-57.47***
		(6.04)	(6.04)		(8.34)		(8.33)		(9.39)		(16.23)
<i>Household income^f</i>											
< 1,000 EUR		-4.57	-6.02		8.62		-33.10*		7.73		-14.55
		(10.41)	(10.20)		(12.38)		(13.01)		(17.14)		(46.93)
1,000 < 1,250 EUR		-3.87	-4.88		-16.37**		2.50		-7.63		54.04
		(7.74)	(7.81)		(5.04)		(18.42)		(21.73)		(34.92)

	All surveys			1991/1992		2001/2002		2012/2013		2022	
	(1.1)	(1.2)	(1.3)	(2.1)	(2.2)	(3.1)	(3.2)	(4.1)	(4.2)	(5.1)	(5.2)
1,250 < 1,500 EUR		-1.11 (3.49)	-1.22 (3.51)		1.35 (3.32)		-11.70 (9.52)		-3.91 (14.14)		70.46+ (42.02)
2,500 < 3,750 EUR		-0.10 (2.62)	-0.29 (2.62)		-1.56 (3.67)		-0.91 (3.97)		-3.09 (4.93)		9.33 (11.79)
3,750 < 5,000 EUR		-0.02 (3.68)	-0.41 (3.69)		-10.62* (4.62)		-12.65* (5.68)		3.68 (5.27)		8.42 (11.55)
5,000 EUR +		-1.89 (4.37)	-2.40 (4.37)		12.80 (11.29)		-6.02 (7.76)		5.22 (6.70)		6.35 (11.78)
<i>East Germany</i> ^e		-4.37+ (2.47)	-4.17+ (2.47)		-5.65+ (3.26)		-5.90 (5.20)		-3.93 (3.96)		-4.25 (4.77)
<i>Survey year</i> ^f											
2001/2002		7.37** (2.30)	-9.68 (34.13)								
2012/2013		12.16*** (2.80)	-10.12 (21.03)								
2022		50.86*** (3.46)	17.73 (21.13)								
<i>Interaction: Cohabiting * Survey year</i> ^g											
Cohabiting=yes * 2001/2002			17.42 (34.15)								
Cohabiting=yes * 2012/2013			22.76 (21.09)								
Cohabiting=yes * 2022			33.97 (21.09)								
<i>Constant</i>	77.27*** (9.04)	84.21*** (13.03)	106.79*** (18.21)	72.94*** (15.90)	91.37*** (15.67)	54.44*** (13.97)	54.35+ (30.95)	55.36*** (16.40)	124.18*** (24.22)	91.47*** (14.67)	107.72*** (25.55)
Respondents	4491	4296	4296	1290	1151	833	777	702	702	1663	1663
Diaries	8388	8047	8047	2207	1973	1617	1510	1365	1365	3199	3199
R squared	0.00	0.22	0.22	0.01	0.09	0.00	0.17	0.00	0.18	0.00	0.16

Notes: Reference categories: ^a Not cohabiting, i.e., single-parent household, ^b Mid secondary education, ^c (Lower) secondary education, ^d No child in this age range present, ^e Not employed, ^f 1,500 < 2,500 EUR, ^g West Germany, ^h 1991/1992, ⁱ Cohabiting=yes * 1991/1992. Unstandardized B-coefficients, clustered standard errors in parentheses, levels of significance: *** p<.001, ** p<.01, * p<.05, + p <.1 (two-tailed). German Time Use Study, 1991/1992, 2001/2002, 2012/2013, 2022, own calculations.

4 Discussion and Conclusion

In light of the debate about gender inequality, convergence and continuity in time use (Leopold et al., 2018; Pailhé et al., 2021; Sullivan et al., 2018), we examined the cohabitation gradient in German mothers' and fathers' childcare time. We used all four available German Time Use Surveys (1991/1992, 2001/2002, 2012/2013, 2022) to show whether non-cohabiting parents' childcare time differed from that of cohabiting parents. In doing so, we added empirical evidence to the mix of important stratification issues concerning unpaid work time to the international literature, actually filling a void for Germany, a country with a still rather "conservative" welfare regime, in which the family plays a major role in providing childcare (Leitner, 2003).

For mothers, our results indicated that non-cohabiting parenthood was associated with higher time budgets for primary childcare compared to cohabiting mothers, i.e., a negative cohabitation gradient in the first 3 and a positive cohabitation gradient in the last survey wave – all of these effects were however statistically insignificant after controlling for compositional differences between cohabiting and non-cohabiting mothers. Therefore, our findings from the most recent German data show no evidence of a cohabitation gradient for mothers in recent years, in line with the majority of international research (Craig, 2005; Craig & Mullen, 2012; García-Saladrigas, 2017; Kendig & Bianchi, 2008; Pepin et al., 2018).

For fathers, our results indicated that non-cohabiting fathers spent more time on primary childcare than cohabiting fathers. As cohabiting fathers' childcare time increased in recent years, this coefficient became smaller over the last three decades. This negative cohabitation gradient was also documented for the United Kingdom (Kalenkoski et al., 2005, 2007), the United States (Kalenkoski et al., 2007), and the Netherlands (Koster & Castro-Martín, 2021). Certainly, we need to put our findings for fathers into perspective by acknowledging the very small number of households that could be included in our analysis, which induced very large confidence intervals in all survey waves, particularly in the 2001/2002 survey. However, the share of non-cohabiting fathers in our sample seemed to resemble the actual share of non-cohabiting fathers in Germany quite well, indicating that our results might be generalizable. In Germany, around 1 in 5 families were non-cohabiting parent families in 2013, most of them with non-cohabiting mothers, and less than 3% with non-cohabiting fathers (Federal Institute for Population Research, 2025). Still, large oversamples of non-cohabiting fathers are needed to gain estimates of their time use with acceptable statistical power in future surveys.

Using cross-sectional data, we cannot identify the causal effect of the cohabitation gradient, and we are limited in our ability to control for unobserved heterogeneity. Non-cohabiting parents are a selective group that likely differs from cohabiting parents in factors that might affect childcare time and that are not included in our data. Particularly, cohabiting fathers are likely to differ systematically from non-cohabiting fathers, who might have more progressive attitudes on the division of childcare, which might affect the cohabitation gradient found here. Longitudinal time use data would allow to overcome these limitations, e.g., by observing childcare time before and after the transition from a two- to a one-parent family. This would give a better indication for the causal effect of family structure on mothers' and fathers' time spent on childcare, as well as for the amount of childcare received by a child (Cano & Gracia, 2022). Relatedly, we cannot account for childcare received from the parent not living at home. Becoming a non-cohabiting parent is not a choice in most cases but rather

the consequence of a union dissolution or a parent's passing (Goldscheider et al., 2015). If non-cohabiting parenthood is the consequence of a separation, then the form of custody is decisive for the question who delivers care to children – does one parent have non-cohabiting custody or is it a joint custody arrangement? Differences in childcare provided from the non-resident parents might not only affect the resident parent's childcare time but they furthermore result in inequalities in childcare time that ultimately affect children's development and wellbeing. While we help to close the substantial research gap on the cohabitation gradient in childcare time in Germany, a number of questions remain unanswered as the number of non-cohabiting or single fathers in German surveys is not sufficient for more sophisticated analyses.

Generally speaking, non-cohabiting parents face the challenge of providing income and home production by themselves, usually with “half the adult time resources available” (Craig, 2005, p. 522). At the same time, “there is a threshold of parental time that must be provided to a child, regardless of whether a parent is absent” (Kalenkoski et al., 2007, p. 373). This situation may result in conflicts of time use because demands in the sphere of (necessary) market work may create time poverty in the sphere of home production, including (necessary and probably also desired) childcare (Craig, 2005). Yet, our results showed that the difference in non-cohabiting and cohabiting mothers' time for primary childcare was tiny in size, resembling findings from several other western countries. Obviously, mothers seemed to “protect time in childcare from the encroachment of other time demands” (Pepin et al., 2018, p. 125), succumbing to the norms of intensive parenting (Altintas, 2016), emphasizing the great value attached to active parent-child contact in contemporary societies. For one thing, spending time with children was found to positively affect parental well-being and life satisfaction (Dotti Sani, 2022). The other side of the coin is, however, that high time demands in several spheres only further increase the likelihood of possible time pressures. This may explain, for example, why non-cohabiting mothers were found to be less satisfied with their time allocation compared to cohabiting mothers (Le & Miller, 2013).

Non-cohabiting fathers, in turn, were found to spend considerably less time on childcare than non-cohabiting mothers but more than cohabiting fathers – while cohabiting fathers' childcare time increased substantially over time, resulting in a smaller cohabitation coefficient in recent compared to earlier years.

Acknowledging the small number of cases again, but now assuming that this finding holds (at least it was in line with previous international findings), this showed that non-cohabiting fathers seemed “in part to compensate for the missing parent” (Kalenkoski et al., 2007, p. 353). Apparently, non-cohabiting fathers' time binds appear to respond to the needs of childcare if structurally necessary. The obvious answer to the question why fathers do not spend as much time on childcare in couple households is, of course, “gender”. Non-cohabiting fathers might be much less restrained by gender roles, and more oriented towards meeting the needs of everyday living, whereas the gender context of cohabiting parents still increases the likelihood of a traditional division of unpaid work, intentionally or unintentionally. Having said this, ample research documented a slow but continuous gender convergence in unpaid work times, including childcare, over recent decades, hand in hand with the necessary behavioral changes (Pailhé et al., 2021; Sullivan et al., 2018). How this development influences the cohabitation gradient in fathers' childcare time is an issue for future research.

Data availability and replication statement

The data of the German Time Use Surveys is available from the Research Data Center of the German Federal Statistical Office: <https://www.forschungsdatenzentrum.de/de/haushalte/zve> (license required). Replication code is available from "OSF":

<https://doi.org/10.17605/osf.io/852ga>.

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