The Effects of Non-standard Employment on the Transition to Parenthood Within Couples: A Comparison of Germany and Australia

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Abstract

Using longitudinal data from Germany and Australia for the 2001–2013 period, this study investigates the link between non-standard employment, such as fixed-term contracts, temporary agency work, part-time and casual work, and first birth within couple relationships. In contrast to previous studies, competing risks event history models are estimated to simultaneously consider couples' risks of first birth and of partnership dissolution. The results indicate, for example, that temporary employment of the female partner, and especially temporary agency work, decreases first birth risks in both countries. This suggests that women, in their dual role as primary carer and secondary earner, seek a secure employment position to return to after parental leave. In contrast, male partner's part-time work negatively affects the first birth risk and simultaneously increases the risk of partnership dissolution only in Australia, suggesting a more important role of men as primary earners in this country. Overall, the study highlights the twofold impact of non-standard employment on fertility, consisting of a direct influence on the first birth risk among stable couples and an indirect influence through the risk of partnership dissolution.

Keywords Couples · Fertility · Dissolution · Non-standard employment · Australia · Germany

1 Introduction

Recent decades have seen rising childlessness and increasing ages at first birth in many industrialised countries. Part of the explanation for these trends may be found in the interplay between the changing nature of work and childbearing decisions. A sufficient income and secure employment are widely regarded as preconditions for

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parenthood (e.g. IfD 2013; Weston et al. 2004); however, increased labour market flexibility may have made these preconditions more difficult to meet. In recent decades, many industrialised countries have seen a departure from the standard employment relationship, defined by wages and salary work on a permanent contract with full-time working hours. A higher share of workers now engages in non-standard forms of employment, such as fixed-term or casual contracts, part-time work, and temporary agency work. Critics argue these forms of employment are more precarious and offer lower job quality than standard employment (e.g. Burgess and Campbell 1998; Kalleberg et al. 2000; Keller and Seifert 2013). Arguably, young people are particularly affected by these labour market trends (Blossfeld et al. 2005), suggesting altered conditions for partnership and fertility decisions.

Against this background, this paper investigates the link between non-standard employment and the risk of first birth. While this topic has received considerable research attention (e.g. Auer and Danzer 2016; Blossfeld et al. 2005; Kingsley 2018; Kreyenfeld 2010; de La Rica and Iza 2005; Lundström and Andersson 2012; Pailhé and Solaz 2012; Tölke and Diewald 2003), this paper adds to the literature in three ways.

First, it extends the usual focus on European and North American countries by a comparison between Germany and Australia—a country for which empirical evidence on the link between employment type and fertility is almost entirely lacking. The only notable Australian study, Kingsley (2018), is limited to women's part-time work, meaning evidence with respect to men or temporary types of employment is absent. Yet comparative studies have stressed the important role of national institutions, like the welfare regime, the employment system and the gender regime, as moderators of the impact of insecure employment and unemployment on family formation (Blossfeld et al. 2005; González and Jurado-Guerrero 2006; Schmitt 2012), suggesting that research results are not readily transferable from one country to another. Comparing Australia and Germany promises important insights into the mediating impact of national institutions, as these countries have different welfare and employment regimes yet similar gender regimes. Australia is a particularly interesting case given the high prevalence of casual work, an employment type associated with high job insecurity.

Second, and related to this point, compared to previous studies, this study broadens the range of employment types investigated in relation to childbearing decisions. Non-standard employment is an umbrella term for a wide range of employment types that have in common some deviation from the standard employment relationship. Still, most studies have been restricted to fixed-term contracts and/or part-time work. Further, these employment types were usually investigated in isolation rather than in combination (as fixed-term part-time, fixed-term full-time and permanent part-time work). Also, no study has investigated the link between temporary agency work, Australian casual work or the German mini-job (a subtype of part-time work connected to particularly low earnings) and first birth. This study compares seven different forms of non-standard employment to account for the heterogeneity in employment conditions within the broad group of non-standard workers.

Third, and most importantly, this study explicitly models the couple relationship as the usual childbearing context. Fertility decisions are highly dependent on

processes of partnership formation, development and dissolution (Klein 2003). Most children are born within couple relationships (González and Jurado-Guerrero 2006), and couples base their fertility decisions on both partners' employment situations (Kaufman and Bernhardt 2012). Yet most previous studies focused on individuals (usually women) and did not sufficiently consider partnership status and/or the partner's characteristics. Further, employment and income situation already influence the risk of partnership formation (González and Jurado-Guerrero 2006; Tölke and Diewald 2003), which in turn affects the risk of first birth. Focusing on individual actors thus does not allow us to distinguish the (indirect) effect of employment situation on fertility through partnership formation from its (more direct) effect on fertility within couples. The present study focuses only on co-residential couples, thus investigating whether the form of employment exerts an impact on fertility once a relationship has been established. Moreover, and contrary to prior studies, it analyses the risks of first birth and of partnership dissolution simultaneously. This extension is important given that non-standard employment may not only affect fertility within (stable) couples but additionally impact on the risk of partnership dissolution—thereby indirectly affecting childbearing. To this end, competing risks event history analysis is applied to data from two household panel studies, the German Socio-Economic Panel (SOEP) and the Household, Income and Labour Dynamics in Australia (HILDA) Survey for the period 2001–2013.

2 Background

2.1 Labour Markets and Welfare

Figure 1 presents the prevalence of different employment types among “core workers”, that is, employees aged 15–64 who are not in education, in Germany and Australia over the 2001–2013 period. Note the break in the total share of non-standard employment in the German data as information on agency work has only been collected in the Mikrozensus since 2006.¹ Across the period, the total share of non-standard employment is considerably higher in Australia. However, it increased in the first part of the period in Germany and remained steady since 2006, hovering around 33%, whereas Australia first exhibited a downward trend in the non-standard employment share, from 40% in 2001 to 38% in 2007, followed by an increase to 41% in 2013.

Throughout the period, part-time work is the most prevalent form of non-standard employment in both countries, with roughly one in four core employees in 2013. Working hours vary considerably for part-time workers, but many work relatively short hours: In 2013, 63% of German and 43% of Australian part-time employees worked 20 h or less.

¹ Another source suggests that agency work has increased over the 2001–2006 period, from around 350,000 in May 2001 to around 550,000 in May 2006 (BA 2016).

Fig. 1 Non-standard employment as a share of employees aged 15–64 who are not in education (in %). Data sourced from StBA (2018) and HILDA release 13. Notes: Shares of individual employment types do not sum to total share of non-standard employment due to overlaps between employment types. For Germany, “in education” comprises persons who (primarily) consider themselves to be students or apprentices; for Australia, it comprises all full-time students. Part-time workers are based on self-classification of main job for Germany and defined as workers who usually work less than 35 h per week for their main job for Australia

Fixed-term contracts, that is, employment contracts that end at a specified date or with the completion of a specified task, account for 8% of employees in Germany and 10% in Australia in 2013. Temporary agency work, characterised by a tripartite relationship between the employer (i.e. the agency), the host company and the worker, accounts for only a small share of workers in both countries (around 2% in 2013). While temporary agency workers can, in theory, have permanent, fixed-term or (in the case of Australia) casual contracts, there is a large overlap between agency work and temporary contracts: Data from the SOEP and HILDA Survey show that many German agency workers have fixed-term contracts, and most Australian agency workers have casual contracts.

Australian casual work, accounting for 16% of core employees, is characterised by an absence of advance employer commitment to the duration of employment or the number of working days or hours (Stewart et al. 2016). Additionally, casual workers are usually not entitled to paid leave (e.g. sick leave or annual leave) but should instead receive a pay loading, typically around 15–25% of the wage of a comparable non-casual worker. Most casual jobs entail part-time working hours and/or are relatively short-term, although some casual employees work for the same employer on a regular basis for years.

A mini-job, accounting for 8% of German employees in 2013, is a subtype of part-time work exempt from most taxes and social security contributions. While this may result in a higher net wage, mini-jobbers are not covered by unemployment or health insurance and often do not accumulate pension points. Further, the usual wage for mini-jobs may not exceed a certain amount, ranging from €322 per month in 2001 to €450 in 2013.

Non-standard employment is embedded into the respective employment systems of the two countries. In Germany, employment relations are traditionally characterised by long-term, high-trust relationships between workers and their employers (Soskice 1991), and correspondingly, permanent contracts are subject to a particularly high level of employment protection legislation (EPL). However, German fixed-term contracts are comparatively unregulated, resulting in a large EPL gap between these two groups of workers (OECD 2013). In Australia, EPL is comparatively low for both permanent and fixed-term workers (OECD 2013); still, there is a large EPL gap between these groups and casual workers, given that casual workers can usually be dismissed any time. In both countries, younger workers (below 35 years) are overrepresented in fixed-term, casual and temporary agency work (Lass and Wooden 2017; Wingerter 2009), suggesting these forms of employment may impact on family formation processes.

Further, the chances of re-employment in case of job loss vary between the two countries. Australia has experienced uninterrupted economic growth in recent decades, resulting in a very low unemployment rate of 5.4% when averaged across the 2001–2013 observation period, compared to an average of 8.1% in Germany (author's calculations based on OECD 2018c). Unemployment also tends to be of shorter duration in Australia, with long-term unemployment rates (of 1 year or more) well below the OECD average, whereas in Germany, long-term unemployment rates are particularly high (OECD 2018b).

The countries also differ in the degree of social protection from the financial consequences of job loss. Germany is a conservative-corporatist welfare state, providing a high level of social security while maintaining status differences within the population. Australia, in contrast, belongs to the group of liberal welfare states, in which social support is usually lower and means-tested (Esping-Andersen 1990). However, Australia also has a long tradition of providing social security through wages policy, which manifests itself, for example, in a comparatively high national minimum wage (OECD 2017b). Germany, in contrast, did not have a national minimum wage until 2015. Overall, the gap between net average earnings and unemployment benefits is larger in Australia (OECD 2017a).

2.2 Fertility, Gender and Family Policy

Both countries exhibit below-replacement-level fertility, rising childlessness and increasing ages at first birth, although these patterns are generally more pronounced in Germany. For example, in 2011, 16% of Australian women aged 45–49 were childless, compared to 20% of German women of the same age group in 2012 (ABS 2013; BiB 2016).

In both countries, the dominant arrangement for couples with children is the modified male breadwinner model, in which men focus on employment and women are secondary earners and primarily responsible for housework and care (Craig and Mullan 2009; Pfau-Effinger and Sakac Magdalenic 2009). Most women become full-time carers, while their children are young but later re-enter the labour market (Baxter 2013; StBA 2017). Whereas almost all fathers work full-time (regardless of their children's ages), most mothers work part-time to reconcile the demands of work and family (Baxter et al. 2007; Heddendorp and Laß 2018; StBA 2017). Overall, maternal employment is higher in Germany than in Australia, but has been growing in both countries over the 2001–2013 period; in Australia it rose from 57 to 63% for mothers of children aged 14 and younger (OECD 2018a, Table LMF 1.2), and in Germany from 63 to 70%.² The gap in maternal employment rates may in part be due to differences in childcare costs: Whereas in Germany couple parents earning the average wage spent 9% of their income on net childcare costs, in Australia they spent 22% (OECD 2017a; average over 2004, 2008 and 2012).

Paid parental leave (PPL) regulations also differ considerably, with both countries seeing major changes recently. Germany has provided PPL throughout the period under study; however, until 2006, the benefit was flat-rate, relatively low and almost exclusively taken up by mothers. Since 2007, PPL is tied to the previous wage (usually at a rate of 67% for up to 12 months) and offers two additional partner months to increase take-up by fathers. While fathers' take-up rates have indeed increased considerably after the reform—reaching 32% for children born in 2013 (StBA

² These data were provided by the German Federal Statistical Office upon request. Note that breaks in the time series reduce the comparability of employment rates over time. Most notably, extrapolation was based on the 1987 Census until 2010 and on the 2011 Census since then. Consequently, there has been a jump in the maternal employment rate by 2.7 percentage points between 2010 and 2011.

2015)—their leave periods are usually short: Of those fathers taking PPL for a child born in 2013, 79% took no more than 2 months, while 92% of mothers received PPL for 10–12 months (StBA 2015).

In contrast, until 2011 Australia was one of only two OECD countries (besides the USA) without a state-funded PPL scheme. PPL was at the discretion of employers and distributed highly unevenly, with low-skilled and casual employees the most likely to miss out (Brennan 2007). The state-funded PPL, introduced in 2011, explicitly targets mothers and is a flat-rate payment at national minimum wage level for up to 18 weeks, meaning that low-paid and part-time workers benefit the most relative to their previous earnings.³

Further, Germany and Australia have both introduced a right for parents to request part-time working hours, in 2001 and 2009, respectively. Before 2009, many Australians seeking part-time hours arguably had to accept casual employment due to a lack of permanent part-time positions (Pocock 2003). Indeed, HILDA Survey data show that after 2009, the share of mothers with permanent part-time positions increased, while those with casual part-time positions declined.

Despite increasing policy support for working parents, in both countries incentives persist for secondary earners to restrict their working hours or not work beyond the period of parental leave. In Germany, taxation laws and health insurance regulations favour single-earner families, while Australia has family income tests for family benefits and high childcare costs.

Additionally, policies for working parents are often designed to match the standard employment relationship. For example, both countries provide generous periods of unpaid parental leave. However, the job guarantee does not hold if the worker has a fixed-term contract that runs out during the leave period and, in the case of Australia, only extends to casual employees if they had a reasonable expectation of continuing employment had it not been for the birth. Moreover, in Australia, employees must have worked for their employer for 12 months to be eligible for unpaid parental leave, which is less likely for workers on casual and fixed-term contracts. Australia also has a work history test for eligibility to PPL. Further, working parents' right to request part-time hours only applies if they have been with their employer for 6 (Germany) or 12 months (Australia).

3 Theoretical Considerations

The theoretical discussion of the impact of non-standard employment on the risk of first birth is structured along the two core characteristics of these employment types: part-time working hours (including regular part-time work and mini-jobs) and temporary employment arrangements (including fixed-term, casual and temporary agency work).

³ A parental leave payment specifically targeted at fathers, named Dad and Partner Pay, followed in 2013. It involves up to 2 weeks of pay at national minimum wage level. The analysis in this paper cannot account for this benefit, however, as it only includes births up to the year 2012.

3.1 Part-Time Employment

Part-time work, including mini-jobs, is characterised by reduced working hours and thus reduced earnings compared to standard employment. It is also likely to have a detrimental impact on future earnings, as part-time workers often have reduced access to training (Bellmann et al. 2013; Draca and Green 2004) and low chances of transitioning into full-time employment (Bothfeld and O'Reilly 2000). Both low current and (expected) future earnings can be expected to impede child-bearing: According to family economics (Becker 1981), children can be regarded as durable consumer goods that are only acquired if the couple has enough financial resources to support a child in the long term. Low income also reduces couples' capacity to make other partnership-specific investments, such as buying a home or getting married, which may be regarded as preconditions for having children. As partnership-specific investments stabilise relationships (Wagner and Weiß 2006), their absence also indirectly renders the birth of a child less likely via an increased risk of partnership dissolution. Unfavourable economic conditions can also reduce partnership quality and stability due to economic stress (Fischer and Liefbroer 2006).

Whereas lower earnings thus suggest a negative effect of part-time work on the risk of first birth compared to standard employment, fewer working hours also provide employees with more time for private activities. This is important considering that work and family compete for time and energy (Düntgen and Diewald 2008; Willekens 1991). In countries like Germany and Australia, where most young children are cared for at home, time competition between employment and children is particularly pronounced. Workers intending to have a child may thus seek part-time positions in anticipation of future time demands for childcare.

The positive fertility effect of a secure and sufficient income is also countered by the opportunity costs of children (Mincer 1963), relating to the income decline experienced by parents who reduce or cease employment to care for a child. These opportunity costs are only partly offset by family benefits. As the opportunity costs of childcare increase with pre-birth income, part-time work should be more beneficial for first birth than standard employment.

These opposing arguments can be reconciled by combining them with the gender regimes in Germany and Australia: Against the dominance of the modified male breadwinner model, the negative fertility effect of reduced income through part-time work should particularly apply to men, as they are expected to be the main (and, while the children are young, even the sole) providers in their families. In contrast, competing demands of work and family and opportunity costs of childcare can be expected to be more relevant for women in both countries, as they usually take over the (majority of) care work. Therefore, the following hypotheses are derived:

H1a–b: Part-time forms of employment, namely (a) permanent part-time work and (b) mini-jobs, positively affect the first birth risk for the female partner.

H2a–b: Part-time forms of employment, namely (a) permanent part-time work and (b) mini-jobs, negatively affect the first birth risk for the male partner.

Considering the different institutional contexts, these gender-specific patterns may be more pronounced in Australia. Full-time working women exhibit particularly large opportunity costs of childcare in Australia given the absence of state-funded PPL until 2011 and the flat-rate nature of PPL since then. In contrast, since 2007 Germany's earnings-based PPL scheme provides incentives for women to seek full-time work before a birth. Further, given high childcare costs, Australian mothers may choose to take a particularly large share of care work, which is incompatible with working full-time. Australian men, in turn, may feel particular pressure to provide a full-time income given their partners' limited access to PPL over the period under study.

H3: The gender-specific effects of part-time forms of employment on the first birth risk are more pronounced in Australia than in Germany.

3.2 Temporary Employment

Temporary forms of employment, that is, fixed-term, casual and temporary agency work, are connected to increased perceived job insecurity (Aletraris 2010; Auer and Danzer 2016; Green and Leeves 2013; Jahn 2015) and an elevated risk of job loss or unemployment (Dütsch 2011; Giesecke and Groß 2003; McGinnity et al. 2005; Wilkins and Wooden 2013) compared to permanent employment. Job insecurity, in turn, may impede long-term planning in the private sphere. Generally, individuals are more prone to make long-term commitments (like marriage or parenthood) if their future employment career is foreseeable (Oppenheimer 1988).

Further, there may be more competition for time and energy between employment and other spheres of life in temporary positions: Hoping to receive a permanent contract, temporary workers may invest much effort and time in their jobs, which may be perceived as irreconcilable with care responsibilities. It may also lower partnership quality through reduced time for joint activities and housework. Additionally, temporary employment often cannot be reconciled with childcare-related employment breaks: In both countries, the job guarantee during parental leave often does not apply to temporary workers, putting them at risk of job loss after a birth, resulting in unemployment (especially in the high-unemployment context of Germany) or an involuntary change into another, potentially lower-quality job.

Additionally, job insecurity connected to temporary employment may affect partnership quality and stability through negative mood spillover (Hughes et al. 1992). Job insecurity is a major stressor that has negative consequences for worker well-being (Sverke et al. 2002). Further strains connected to temporary employment may include lack of social integration and appreciation at the workplace due to being outsiders or newcomers, and frequently changing working conditions or workplaces.

The previous points suggest a negative effect of temporary employment on first birth. However, it has also been argued that workers may compensate for a lack of certainty, satisfaction or success in the work sphere by seeking these gratifications in the family sphere (Friedman et al. 1994; Lambert 1990; Tölke and Diewald 2003), suggesting that temporary workers may be more prone to having a first child.

Adding a gender role perspective, in the traditional male breadwinner model, this compensation strategy mainly applies to women (Kurz et al. 2005; Schmitt 2012): As designated caregivers, the full-time homemaker role is an available alternative to the worker role (Offe and Hinrichs 1977). Nevertheless, in the *modified* male breadwinner model, women cannot be assumed to follow the compensation strategy: As most women (wish to) re-enter the labour market after a period of full-time caring, having a secure job to return to should be of high importance in their childbearing decisions. In sum, the theoretical arguments mainly suggest a negative effect of temporary employment on the first birth risk for both genders.

H4a–c: Temporary forms of employment, namely (a) fixed-term full-time work, (b) temporary agency work and (c) casual full-time work, negatively affect the first birth risk for the male and the female partner.

Comparing the two countries, the detrimental effects of temporary employment may be expected to be stronger in Germany than in Australia: Germany's stronger protection of permanent jobs and higher unemployment rate may result in more severe career disadvantages for temporary workers, although the financial risks of temporary employment are in part cushioned by a more generous welfare system.

H5: The negative effect of temporary employment on the first birth risk is more pronounced in Germany than in Australia.

3.3 Temporary Part-Time Employment

Employment types that are both temporary and part-time combine lower earnings and higher job insecurity. These forms of employment can thus be expected to have negative effects on first birth for both genders in both countries.

H6a–b: Forms of employment that are both temporary and part-time, such as (a) fixed-term part-time work and (b) casual part-time work, negatively affect the first birth risk for the male and the female partner.

4 Data and Method

4.1 Data and Sample

The study uses data from two household panel studies, version 30 of the German SOEP (<https://doi.org/10.5684/soep.v30>) and release 13 of the HILDA Survey (Watson and Wooden 2012). While the SOEP started in 1984, the HILDA Survey commenced in 2001 and was designed in a way that mimics practices of successful household panel studies, notably the SOEP. The two surveys thus share many common features in terms of sampling methodology and questionnaire design. For example, both collect comprehensive information on respondents' employment

situations and household structures as well as retrospective information on parenthood, allowing the construction of respondents' relationship and fertility histories. Both surveys interview all adult household members annually, enabling the analysis of the characteristics of both partners of a couple.

The analysis is based on the period 2001–2013. The samples consist of co-residing couples, that is, nonmarital cohabitations and marriages, where the female partner is initially childless. It excludes Living-Apart-Together relationships as the datasets do not provide sufficient information on partners outside the household. Couples that are already part of the surveys in 2001 and those that join at later points in time are both included, but only those with information on the time they started living together were retained to enable calculation of partnership duration.⁴ To reconstruct consistent partnership and fertility histories, information from both partners and various variables over all available panel waves is drawn upon. In the case of contradictory information from the partners, the female partner's information is used as women tend to recall relationship events more accurately (Reimondos et al. 2011). The data are prepared in couple-year format, that is, each couple contributes an observation for each year the partnership is observed. The couple is right-censored when it leaves the study, or the female partner surpasses 45 years of age. All remaining couples are right-censored in 2012.⁵

The final samples comprise 1709 Australian and 1495 German couples, contributing 4946 and 4728 observations, respectively. Around one third of couples (38% in the Australian and 35% in the German sample) are left-truncated, meaning their partnership existed before entering the observation window. Yet discrete-time event history analysis of data in couple-year format yields unbiased estimates even in the presence of left truncation (Rabe-Hesketh and Skrondal 2012).

4.2 Variables

The event variable indicates whether the couple (1) experiences no partnership transition, (2) has a first child, or (3) separates within the next year. The focus is on the female partner's birth biography due to incomplete birth biographies of male respondents in the SOEP. Birth is backdated by 9 months to approximate the point in time when the couple decided to have a child. A couple is considered as separated if either one partner moves out of the household or one partner reports a separation or to be single, even if the former partners still live in the same household. In those (very rare) cases where the (backdated) birth and separation happen in the same year, the pregnancy is assumed to precede separation.

⁴ Whereas the HILDA Survey includes retrospective questions on the date at which couples started living together, in the SOEP data preparation had to rely primarily on observing couples moving in together during the panel. Around 16% of the SOEP couples had to be discarded due to the lack of information on the date of moving in together.

⁵ Waves 2012 and 2013 are not used in the estimation as it requires up to two subsequent waves to establish whether a point in time was followed by a pregnancy given that many births are only reported two waves later.

The key independent variable is a classification of employment types based on four pieces of information: (1) contract type (permanent, fixed-term or, in Australia, casual), (2) whether direct-hire or temporary agency employment, (3) working hours (part-time or full-time), and (4) in the German case, whether part-time workers are mini-jobbers.

Information on contract type is sourced from two broadly comparable questions in the surveys. In the SOEP, all workers are asked whether their employment contract is permanent or fixed-term, with a third option “not applicable, do not have an employment contract”.⁶ In the HILDA Survey, employees are asked whether they are employed on a fixed-term contract, a casual basis or a permanent/ongoing basis, with a fourth option “other”.⁷ In both surveys, another question asks workers whether they are employed through a temporary employment agency. Part-time and full-time workers are identified based on their reported usual weekly working hours,⁸ with part-time work defined as less than 35 h. In the SOEP, respondents working less than 30 h per week are additionally asked whether this employment is a mini-job. In case a worker has several jobs, all characteristics refer to the main job.

These characteristics are combined in two different ways for the analysis. In a first step, the broad category “temporary employment” (comprising fixed-term contracts, casual contracts and agency work) is compared to “permanent employment”, and “part-time employees” (including regular part-time and mini-jobs) are compared to “full-time employees”.

In a second step, the specific employment type is analysed based on combinations of the above characteristics. The “standard employment relationship” (i.e. direct-hire full-time work on a permanent contract) is compared to “fixed-term full-time work”, “fixed-term part-time work”, “permanent part-time work”, “temporary agency work” as well as “mini-jobs” (for Germany) and “casual full-time work” and “casual part-time work” (for Australia). Due to their low prevalence, mini-jobbers are not distinguished by whether their contract is permanent or fixed-term. Similarly, as the group of agency workers is very small in both countries, all employees identifying as agency workers are placed in this category (regardless of working hours/mini-jobber status and contract type). In the SOEP, around 3% of observations could not be assigned to one of the above categories due to incomplete or inconclusive information regarding their employment situation,⁹ so a category “employee but

⁶ Whereas the option “not applicable” is mainly designed for the self-employed, around 5% of employees in the analysis sample also chose this response. Of this group, more than a third were Beamte, a type of state official that is not issued with an employment contract. Given that Beamte are generally hired for life after a few years of probation, Beamte reporting not to have a contract were re-classified as permanent workers.

⁷ The “other contract” category had extremely few cases, and these were thus discarded.

⁸ In the SOEP sample, a small number of observations (less than 2%) lacked information on usual working hours. In these cases, self-classification was used instead, with those identifying as part-time or marginal workers and those who consider themselves not working but worked in the last week classified as part-time workers.

⁹ The largest group in this category are employees who report not to have an employment contract (and were not Beamte). The second largest group are workers classified by the SOEP as not working but who were working according to the ILO labour force concept.

missing details” was added. In the HILDA Survey, the very small number of cases with missing or inconclusive information was excluded.

Additional categories were constructed for non-employees. First, a category “self-employed” includes self-employed persons and unpaid family workers. Second, following the International Labour Organisation, a category “unemployed” includes those who did not work last week, are actively looking for work and are available for work. A third category “in education” aims to cover persons attending school, university or vocational training as their prime activity. For HILDA, this is operationalised by assigning all full-time students as well as non-working part-time students to this category. The SOEP does not distinguish whether a degree is pursued full-time or part-time. Therefore, it is assumed that education is the prime activity for all secondary students (except night school) and apprentices. Tertiary students, however, are assigned to the “in education” category only if their self-reported activity status is “not working”, while those considering themselves employed are assigned to one of the employment categories. Note this means that the mini-job category includes many working students. All unemployed students are classified as unemployed. Fourth, respondents are classified as “inactive” if they are neither employed nor unemployed or in education.

Besides employment situation, several other individual and couple characteristics are included in the models. In the main specification, the individual-level characteristics comprise age, educational level, country of birth and health. Age is inserted in quadratic form to accommodate its “bell-shaped” relationship with first birth. Educational levels are coded according to the International Standard Classification of Education (ISCED) 1997 and assigned to three categories: “low (ISCED 0–2)”, “medium (ISCED 3–4)” and “high (ISCED 5–6)”. Given that educational information was unavailable for a small share of SOEP respondents, the German models contain a dummy for missing educational level. With respect to country of birth, there is much heterogeneity both between and within the German and Australian samples. In order to create broadly comparable categories, the countries were classified according to their total fertility rate (TFR) in the year 2001 (The World Bank 2016). For Australia, the analysis distinguishes between “natives” and migrants from “low-fertility countries” (TFR of 1.5 and less), “medium-fertility countries” (TFR between 1.6 and 2.0) and “high-fertility countries” (TFR of 2.1 and more). As the German sample contains a smaller number of migrants, medium- and high-fertility countries were combined. For both countries, satisfaction with health is included as a metric variable ranging from 0 (totally dissatisfied) to 10 (totally satisfied).¹⁰ All models contain both partners’ characteristics simultaneously.

The couple-level characteristics comprise partnership duration, region of residence, resident children of the male partner and period. Partnership duration serves as the risk period in the event history analysis and is measured in years from moving in together. To accommodate the fact that the first birth risk rises steeply during the

¹⁰ Around 1% of observations from the SOEP sample lacked information on health satisfaction. These values were imputed using the current state of health, which is measured on a five-point ordinal scale from “very good” to “bad”. Correlation between these variables is high (0.74).

first few years of a relationship and then slowly declines (Klein 2003), the duration is modelled via a linear and a logarithmised term. Region of residence is accounted for in different ways: For Australia, the 2011 Remoteness Area (ASGC-RA) is included, distinguishing between “Major Cities of Australia”, “Inner Regional Australia” and more remote areas. This indicator has previously been shown to be related to fertility (Heard and Arunachalam 2015). For Germany, a dummy variable indicating couples in East Germany is included, reflecting persisting differences in fertility behaviour between East and West Germany (Goldstein and Kreyenfeld 2011). Further, the models contain an indicator for resident children of the male partner¹¹ as a first birth is measured with respect to the female partner’s birth history. Also, three dummies are included representing the periods 2004–2006, 2007–2009 and 2010–2011, with 2001–2003 as reference category. All variables except for country of birth are time-varying on a yearly basis.

In a second specification, several control variables were added that are potentially endogenous as they, at least in part, may be affected by the type of employment and may, in turn, affect the decision to have a child or separate. These are marital status, labour income and job satisfaction. Marital status is reflected by a dummy indicating married couples. Job satisfaction was originally measured on a scale from 0 to 10 in both surveys and was then categorised to “low (0–4 points)”, “medium (5–7 points)”, “high (8 points)” and “very high (9–10 points)”. The SOEP models additionally contain a missing indicator for job satisfaction. The income measure reflects current monthly gross income from all jobs (in €) in the German models and current monthly gross income from wages and salary¹² in all jobs (in A\$) in the Australian models, and values have been deflated using the national consumer price indices (with 2001 as base year).

Table 1 provides the distribution of these characteristics in the samples. Some differences between the genders and the countries are worth highlighting: Standard employment is more prevalent in Germany than in Australia and within each country more frequent among men than women. In both countries, women are more likely than men both to have a temporary contract and to work part-time. Further, the Australian sample is more highly educated than the German sample. In Germany’s dual education system, many high-school graduates take up apprenticeships, while young Australians more frequently pursue a university degree. Mean ages and partnership duration are slightly lower in the Australian sample, reflecting a faster transition to first parenthood (as is discussed below).

¹¹ Broadly speaking, children are assigned to the household of the parent where they spend most of their time. As in both countries, most children live with their mother post-separation, the variable “resident children of the male partner” will capture a relatively small share of their children. However, the analysis cannot account for non-resident children given that not all these children are known in the SOEP. Further, resident children can be expected to have the strongest impact on partnership transitions.

¹² Note that income for the Australian self-employed is underestimated as the HILDA measure does not include business income.

Table 1 Distribution of characteristics in the samples by country and gender (in % unless stated otherwise)

	Germany		Australia	
	Women	Men	Women	Men
<i>Individual characteristics</i>				
Type of contract				
Permanent contract	62.84	65.63	58.69	61.08
Temporary contract	13.45	10.41	20.32	16.32
Missing contract	3.47	3.26	–	–
Working hours				
Full-time employee	64.70	73.67	64.78	72.46
Part-time employee	15.06	5.63	14.23	4.93
Employment type/status				
Standard employment	54.08	63.07	52.49	59.50
Fixed-term full-time	7.80	6.85	8.31	6.71
Permanent part-time	6.87	1.95	6.21	1.58
Fixed-term part-time	2.86	0.82	1.13	0.30
Mini-job	3.41	1.25	–	–
Casual full-time	–	–	2.45	3.86
Casual part-time	–	–	6.37	2.83
Temporary agency	1.88	2.39	2.06	2.61
Employee, missing details	2.86	2.96	–	–
Self-employed	3.79	8.31	5.28	12.47
In education	9.90	5.52	7.54	4.23
Unemployed	3.98	4.53	4.10	2.95
Inactive	2.58	2.35	4.06	2.95
Age (mean)	29.69	33.34	28.80	31.55
Educational level				
Low (ISCED 0–2)	10.30	8.38	7.84	10.53
Medium (ISCED 3–4)	58.16	58.16	41.37	49.86
High (ISCED 5–6)	29.36	32.34	50.79	39.61
Missing	2.18	1.12	–	–
Country of birth				
Native	92.34	92.28	82.79	82.55
Abroad—low fertility	4.21	4.02	3.54	2.35
Abroad—medium fertility			8.47	10.07
Abroad—high fertility			5.20	5.03
Abroad—medium/high fertility	3.45	3.70		
Health satisfaction (mean)	7.17	7.20	7.56	7.62
Monthly labour income (mean €/€)	1657	2315	2795	3639
Job satisfaction				
Low (0–4 points)	9.48	9.18	4.43	5.34
Medium (5–7 points)	32.99	32.97	29.61	34.28
High (8 points)	21.38	24.94	26.59	27.14

Table 1 (continued)

	Germany		Australia	
	Women	Men	Women	Men
Very high (9–10 points)	17.34	18.57	23.66	23.11
Missing	2.35	1.95	–	–
<i>Couple characteristics</i>				
Partnership duration (mean, years)	4.81	4.81	4.69	4.69
Region				
West Germany	82.89	82.89	–	–
East Germany	17.11	17.11	–	–
Major Cities of Australia	–	–	71.61	71.61
Inner Regional Australia	–	–	16.60	16.60
More remote parts of Australia	–	–	11.79	11.79
Resident children of male partner	2.26	2.26	2.02	2.02
Period				
2001–2003	29.08	29.08	24.71	24.71
2004–2006	29.72	29.72	25.56	25.56
2007–2009	25.66	25.66	27.36	27.36
2010–2011	15.55	15.55	22.38	22.38
Partnership type				
Cohabitation	61.25	61.25	57.26	57.26
Marriage	38.75	38.75	42.74	42.74
N (couple-years)	4728	4728	4946	4946

4.3 Method of Analysis

The study applies discrete-time event history analysis (Allison 1982; Yamaguchi 1991) to investigate the risk of two transitions among couples, namely first birth and partnership dissolution. The risks of these two events are considered simultaneously using competing risks models, which are estimated by means of multinomial logistic regression.

The first step of the analysis lies in the description of the birth and dissolution risks in the two countries by means of hazard rates and cumulative incidence functions, without controlling for any other individual or couple characteristics. Hazard rates describe the conditional probabilities of a first birth or partnership dissolution occurring at a specific partnership duration, given that these events have not yet occurred. Cumulative incidence functions designate the proportion of couples who have experienced a first birth or separated after a certain period.

The second step consists of the multivariate event history analysis of the link between non-standard employment and these partnership transitions. For each country, results from five separate models are presented: In Model 1, the group of employees is broadly differentiated by contract type (permanent vs. temporary) and working hours (full-time vs. part-time). In Model 2, the analysis considers specific employment types, comparing standard employment to seven types of non-standard

employment. Both models also contain categories for other activity states, such as self-employment or unemployment, as well as the full set of control variables described above under the main specification. Additionally, the robustness of the results is tested by re-estimating Model 2 including additional controls (Model 3), limiting the sample to women aged 35 and younger (Model 4), and including a revised employment status variable that classifies everyone pursuing a course of study as “in education” (Model 5).

5 Results

5.1 Hazard of First Birth and Partnership Dissolution

Figure 2 shows the hazard rates of first birth (backdated by 9 months) and of partnership dissolution for couples in Australia and Germany depending on partnership duration. In both countries, the hazard of first birth rises within the first years of partnership duration and then decreases until around year 14, after which close to no children are born. However, the hazard of first birth among Australian couples increases more steeply in the beginning and is higher than the corresponding hazard for German couples at all partnership durations. This trajectory reflects the generally lower rates of childlessness in Australia.

In both countries, the risk of partnership dissolution is considerably lower than the first birth risk; however, the *trajectories* of the hazard rates of dissolution differ between the countries: In Australia, the dissolution risk is highest in the very first year and then declines; in Germany, it increases until year three before declining. At most points in time, couples in Germany are more prone to separate than their Australian counterparts. Further analyses reveal that these differences in dissolution rates are driven by cohabitations, which dominate the group of separating couples.

Fig. 2 Hazard rates of first birth (backdated by 9 months) and partnership dissolution (in %)

Fig. 3 Cumulative incidence function of first birth (backdated by 9 months) and partnership dissolution (in %)

The estimated dissolution rates of marriages are much lower and follow a similar, flatter trajectory in both countries.

Figure 3 presents the cumulative incidence functions of first birth and partnership dissolution. Due to the constantly higher hazard of first birth, the share of childless couples decreases faster in Australia than in Germany: After 5 years of partnership duration, 47% of Australian couples had a first child, whereas 19% had separated; in Germany, 40% had their first child and 24% had separated. These differences widen with partnership duration: After 14 years, 69% of Australian couples had a first child and 24% had separated, compared to 56% and 33% of German couples, respectively. Thus, in both countries almost all couples have undergone one or the other partnership transition, with only 11% of German couples and 7% of Australian couples still

intact and childless. Parenthood is thus the empirical norm in stable co-residential couples in the two countries.

5.2 Non-standard Employment, First Birth and Partnership Dissolution

This section presents results from multivariate competing risks event history models that simultaneously estimate the association of the employment situation with the risk of first birth (backdated by 9 months) and with the risk of partnership dissolution, controlling for individual and couple characteristics. Table 2 presents the results from Model 1, which broadly compares temporary employment (i.e. fixed-term, casual and agency work) to direct-hire permanent employment, and part-time hours (i.e. part-time work, mini-jobs) to full-time hours.

Table 3 then presents results from Model 2, investigating the impact of the specific type of non-standard employment on the first birth risk and the dissolution risk compared to the standard employment relationship (direct-hire, full-time, permanent contract). The results are discussed in two steps, first with respect to part-time work, then with respect to temporary employment.

5.2.1 Part-Time Employment

For women as main caregivers, part-time forms of employment were expected to have a positive effect on the first birth risk due to the enhanced time budget and lower opportunity costs (H1a–b), and given differences in PPL and childcare costs, this was expected to be more the case in Australia (H3). However, part-time work that comes with a temporary contract (i.e. fixed-term and casual part-time) was expected to negatively affect the first birth risk for women given the inherent career insecurity (H6a–b).

Model 1 shows that the broad category of part-time work is indeed associated with a 26% increase in the first birth risk compared to standard employment ($p < 0.10$) among Australian women, but does not differ significantly from standard employment among German women. This result may be due to higher childcare costs that increase the importance of mothers as primary carers in Australia. Further, it may be linked to the fact that since 2007, PPL in Germany is tied to previous wage, incentivising women to work full-time before a birth.

Focusing on the specific employment type, Model 2 shows that, consistent with expectation, permanent part-time work is the only part-time employment form positively associated with first birth¹³: Compared to standard employment, it is linked to

¹³ The interplay of part-time hours and a permanent contract was also formally tested by re-estimating Model 1 including a respective interaction term. For German women, results show that part-time hours are positively (but insignificantly so) associated with first birth risks for permanent workers, but significantly and negatively linked to first birth risks for temporary workers. Among Australian women, part-time hours are significantly and positively associated with first birth risks for permanent workers, but this association is weaker and statistically insignificant for temporary workers.

Table 2 Hazard ratios from discrete-time event history analysis of the effect of temporary contracts and part-time hours on the risk of first birth (backdated by 9 months) and partnership dissolution (Model 1)

	Germany		Australia	
	B	D	B	D
Type of contract—female partner (ref. permanent contract)				
Temporary contract	0.63**	1.19	0.79*	1.13
No contract/not applicable	0.59	0.85	—	—
Self-employed	1.19	0.88	0.91	0.76
In education	0.50**	1.29	0.59*	1.61*
Unemployed	1.04	1.63 ⁺	1.21	1.54
Inactive	0.95	0.74	0.93	0.54
Type of contract—male partner (ref. permanent contract)				
Temporary contract	0.97	0.90	1.29*	1.19
No contract/not applicable	0.75	1.26	—	—
Self-employed	0.85	1.22	1.19	1.35
In education	0.70	1.07	0.91	1.11
Unemployed	1.17	1.08	0.95	1.44
Inactive	1.25	0.35 ⁺	1.16	1.75
Working hours—female partner (ref. full-time employee)				
Part-time employee	0.91	1.18	1.26 ⁺	0.90
Working hours—male partner (ref. full-time employee)				
Part-time employee	0.96	1.01	0.72	1.63 ⁺
Age—female partner	1.77**	0.84 ⁺	1.31**	0.81 ⁺
Age squared—female partner	0.99**	1.00	1.00**	1.00
Age—male partner	1.27**	0.96	1.26**	1.01
Age squared—male partner	1.00**	1.00	1.00**	1.00
Educational level—female partner (ref. medium)				
Low education	1.32	1.29	1.21	0.71
High education	1.26 ⁺	0.79	1.06	0.61**
Missing education	0.95	1.20	—	—
Educational level—male partner (ref. medium)				
Low education	1.02	1.29	0.95	0.81
High education	1.05	1.03	0.94	0.71 ⁺
Missing education	1.70	1.27	—	—
Country of birth—female partner (ref. native)				
Abroad—low fertility	1.61*	0.83	1.04	1.23
Abroad—medium fertility			1.25	1.30
Abroad—high fertility			1.12	0.64
Abroad—medium/high fertility	1.19	0.83		
Country of birth—male partner (ref. native)				
Abroad—low fertility	1.19	0.84	0.89	0.21
Abroad—medium fertility			1.08	1.72**
Abroad—high fertility			0.93	1.39
Abroad—medium/high fertility	1.86*	0.91		

Table 2 (continued)

	Germany		Australia	
	B	D	B	D
Health satisfaction—female partner	1.02	0.97	1.05 ⁺	0.95
Health satisfaction—male partner	1.03	0.95	1.12**	0.92*
Partnership duration	0.92 ⁺	0.95	0.85**	1.03
Log partnership duration	1.28	2.30 ⁺	5.08**	0.61
Region (ref. West Germany/Major Cities of Australia)				
East Germany	1.72**	0.98	—	—
Inner Regional Australia	—	—	1.14	0.90
More remote Australia	—	—	0.94	1.07
Resident children of male partner	0.76	1.09	1.27	0.77
Period (ref. 2001–2003)				
2004–2006	1.11	1.04	0.97	1.02
2007–2009	0.93	0.83	0.99	0.93
2010–2011	1.11	0.98	0.88	0.90
Constant	0.00**	7.17	0.00**	7.81
<i>N</i> (couple-years)	4728		4946	
<i>N</i> (births)	523		661	
<i>N</i> (dissolutions)	314		250	

B birth, *D* Dissolution; ⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

a 36% increase in the first birth risk in Australia ($p < 0.10$). In contrast, fixed-term part-time work is negatively associated with the first birth risk for German women ($HR = 0.40$; $p < 0.05$). Contrary to expectations, mini-jobs and casual part-time work are not significantly related to first birth risks. That permanent part-time work is beneficial for entry into motherhood suggests it is not simply the reduced working hours which matter for childbearing; instead, these should come as a package with a job guarantee so that women are entitled to return to this position after parental leave.

However, the results for the risk of partnership dissolution reveal a potential downside to women's permanent part-time work as it is linked to an increased dissolution risk in Germany ($HR = 1.52$; $p < 0.10$).

For men, the theory suggests a negative effect of part-time forms of employment on the first birth risk due to reduced breadwinning capacity (H2a–b), and this was expected to be more pronounced in Australia (H3). A negative effect on the first birth risk was also expected for employment types that are simultaneously part-time and temporary (H6a–b). As Model 1 shows, contrary to expectation, part-time working hours in general among men are not significantly associated with first birth risks in either country.

However, the more detailed results from Model 2 reveal differences between Australian and German men. In Germany, none of the part-time employment types are

Table 3 Hazard ratios from discrete-time event history analysis of the effect of non-standard forms of employment on the risk of first birth (backdated by 9 months) and partnership dissolution (Model 2)

	Germany		Australia	
	B	D	B	D
Employment type/state—female partner (ref. standard employment)				
Fixed-term full-time	0.80	1.29	0.86	1.14
Permanent part-time	1.18	1.52 ⁺	1.36 ⁺	1.08
Fixed-term part-time	0.40*	1.04	0.70	0.47
Mini-job	0.68	0.63	—	—
Casual full-time	—	—	1.18	2.03*
Casual part-time	—	—	1.07	0.98
Temporary agency	0.45 ⁺	1.96 ⁺	0.25**	0.70
Employee, missing details	0.77	0.97	—	—
Self-employed	1.22	0.90	0.92	0.77
In education	0.51**	1.26	0.59*	1.68*
Unemployed	1.09	1.63 ⁺	1.23	1.60 ⁺
Inactive	1.00	0.77	0.94	0.57
Employment type/state—male partner (ref. standard employment)				
Fixed-term full-time	0.81	0.55*	1.19	1.07
Permanent part-time	0.97	0.59	0.42 ⁺	1.54
Fixed-term part-time	0.80	1.01	~	~
Mini-job	1.23	0.93	—	—
Casual full-time	—	—	1.38	1.39
Casual part-time	—	—	0.73	2.04*
Temporary agency	1.35	1.88*	1.24	1.03
Employee, missing details	0.72	1.09	—	—
Self-employed	0.84	1.18	1.17	1.34
In education	0.71	1.05	0.90	1.08
Unemployed	1.18	1.09	0.95	1.42
Inactive	1.23	0.35 ⁺	1.11	1.67
Age—female partner	1.78**	0.84	1.31**	0.82 ⁺
Age squared—female partner	0.99**	1.00	1.00**	1.00
Age—male partner	1.28**	0.96	1.26**	1.01
Age squared—male partner	1.00**	1.00	1.00**	1.00
Educational level—female partner (ref. medium)				
Low education	1.33	1.31	1.23	0.68
High education	1.26 ⁺	0.80	1.05	0.62**
Missing education	0.99	1.26	—	—
Educational level—male partner (ref. medium)				
Low education	1.02	1.28	0.95	0.82
High education	1.07	1.05	0.95	0.72 ⁺
Missing education	1.68	1.43	—	—
Country of birth—female partner (ref. native)				
Abroad—low fertility	1.63*	0.85	1.01	1.23

Table 3 (continued)

	Germany		Australia	
	B	D	B	D
Abroad—medium fertility			1.25	1.30
Abroad—high fertility			1.16	0.62
Abroad—medium/high fertility	1.12	0.78		
Country of birth—male partner (ref. native)				
Abroad—low fertility	1.19	0.79	0.90	0.20
Abroad—medium fertility			1.10	1.75**
Abroad—high fertility			0.92	1.39
Abroad—medium/high fertility	1.83*	0.88		
Health satisfaction—female partner	1.02	0.97	1.05 ⁺	0.96
Health satisfaction—male partner	1.03	0.95	1.12**	0.92*
Partnership duration	0.92 ⁺	0.95	0.85**	1.02
Log partnership duration	1.31	2.28 ⁺	5.23**	0.62
Region (ref. West Germany/Major Cities of Australia)				
East Germany	1.70**	0.97	—	—
Inner Regional Australia	—	—	1.13	0.89
More remote Australia	—	—	0.92	1.04
Resident children of male partner	0.74	1.11	1.22	0.78
Period (ref. 2001–2003)				
2004–2006	1.10	1.01	0.98	1.03
2007–2009	0.92	0.83	1.00	0.94
2010–2011	1.11	1.01	0.88	0.90
Constant	0.00**	8.01	0.00**	6.94
<i>N</i> (couple-years)	4728		4946	
<i>N</i> (births)	523		661	
<i>N</i> (dissolutions)	314		250	

B birth, *D* dissolution; ⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; ~ cell size below 30 cases

significantly related to the first birth risk for men. In contrast, in Australia, permanent part-time work is negatively linked to the first birth risk ($HR = 0.42$; $p < 0.10$).¹⁴ As expected, the Australian results are thus more consistent with the assumption that men postpone entrance into parenthood while working part-time, pointing to the importance of men's breadwinning ability. This result is underpinned by the association of men's part-time work with the risk of partnership dissolution: As shown in Model 1, part-time working men have an increased dissolution risk in Australia ($HR = 1.63$; $p < 0.10$), and from Model 2 we see that it is particularly those in casual part-time work who have an increased dissolution risk ($HR = 2.04$; $p < 0.05$).

¹⁴ The coefficient for fixed-term part-time work for Australian men is not reported due to very low cell size.

5.2.2 Temporary Employment

Temporary forms of employment, that is, fixed-term, casual and agency work, were assumed to negatively affect first birth risks for women on the grounds of uncertain career perspectives, difficulties of reconciling the time demands of work and family and negative mood spillover (H4a–c). Under the prevailing modified male breadwinner model, it was expected that women wish to prepare for a smooth re-entry into the labour market and therefore aim at a permanent position before entering motherhood. Given the high EPL for permanent jobs and the higher unemployment rate, this effect was expected to be stronger in Germany (H5).

The results overall support these assumptions: According to Model 1, in both countries, temporary employment in general is related to a reduced first birth risk for women, and the link appears to be stronger in Germany: German women on temporary contracts have a 37% lower first birth risk than those on permanent contracts ($p < 0.01$), and Australian women on temporary contracts have a 21% lower risk ($p < 0.05$).

Looking at the specific employment types in Model 2, temporary agency work is strongly negatively linked to first birth risks among women in both countries, reducing the risk by 55% in Germany ($p < 0.10$) and by 75% in Australia ($p < 0.01$). Among German women, agency work is additionally linked to an increased risk of partnership dissolution ($HR = 1.96$; $p < 0.10$). Contrary to expectation, casual full-time work is not significantly related to entry into motherhood in Australia. However, there is a positive association of casual full-time employment with the dissolution risk for Australian women ($HR = 2.03$; $p < 0.05$), and thereby indirectly also a negative effect on the risk of first birth.

The theory also suggests a negative effect of temporary forms of employment on first birth risks for men for the same reasons as for women (H4a–c), with a more detrimental effect expected for Germany (H5). Contrary to expectation, Model 1 shows that temporary contracts are not significantly linked to first birth risk for German men, whereas there is even a positive association in Australia ($HR = 1.29$; $p < 0.05$). Yet focusing on Model 2, none of the individual temporary employment types have a statistically significant association with first birth risks among men in either country.

A possible explanation for the unexpected absence of a detrimental impact of men's temporary employment on first birth risk may be that men usually stay in employment continuously around the time of birth and so possibly place less weight on the reinstatement rights attached to parental leave-taking on permanent contracts. Additionally, casual full-time work in Australia may in some cases be beneficial to prospective fathers to the extent that they benefit from the pay loading connected to casual work to build an economic foundation for parenthood.

While there is no negative association with first birth risk among stable couples, Model 2 shows that some types of temporary employment among men may have an indirect negative effect on fertility through relationship stability: Temporary agency work is associated with an increased dissolution risk for German men ($HR = 1.88$; $p < 0.05$), and casual part-time work with a higher dissolution risk for Australian men ($HR = 2.04$; $p < 0.05$). However, fixed-term full-time work is associated with a decreased dissolution risk for German men ($HR = 0.55$; $p < 0.05$).

Table 4 Hazard ratios from discrete-time event history analysis of the effect of non-standard forms of employment on the risk of first birth (backdated by 9 months) and partnership dissolution, robustness checks for Model 2

	Australia									
	Germany					Australia				
	Model 3 (Extended controls)		Model 4 (Female aged 35 or less)		Model 5 (Re-classified education)		Model 3 (Extended controls)		Model 4 (Female aged 35 or less)	
	B	D	B	D	B	D	B	D	B	D
Employment type—female partner (ref. standard employment)										
Fixed-term full-time	0.81	1.27	0.72 ⁺	1.24	0.83	1.39	0.95	1.12	0.86	1.23
Permanent part-time	1.25	1.54 ⁺	1.36	1.51	1.25	1.30	1.40 ⁺	0.97	1.33	1.11
Fixed-term part-time	0.46 [*]	0.95	0.40 [*]	0.93	0.50 ⁺	1.41	0.88	0.39	0.79	0.00
Mini-job	0.70	0.53	0.69	0.55	1.25	0.85	—	—	—	—
Casual full-time	—	—	—	—	—	—	1.24	1.89 ⁺	1.04	1.97 [*]
Casual part-time	—	—	—	—	—	—	1.19	0.84	1.02	0.86
Temporary agency	0.43 ⁺	1.91 ⁺	0.49	2.12 [*]	0.64	1.57	0.26 [*]	0.69	0.23 ^{**}	0.74
Employee, mis. details	0.78	0.92	0.74	1.06	0.83	0.71	—	—	—	—
Employment type—male partner (ref. standard employment)										
Fixed-term full-time	0.80	0.53 [*]	0.84	0.50 [*]	0.79	0.64	1.17	1.07	1.17	1.09
Permanent part-time	0.99	0.53	0.92	0.49	0.98	0.74	0.47	1.50	0.44 ⁺	1.71
Fixed-term part-time	0.92	0.87	0.85	1.15	~	~	~	~	~	~
Mini-job	1.21	0.90	1.23	1.07	~	~	—	—	—	—
Casual full-time	—	—	—	—	—	—	1.51 ⁺	1.35	1.42	1.40
Casual part-time	—	—	—	—	—	—	0.77	2.07 [*]	0.68	2.33 ^{**}
Temporary agency	1.46	1.69 ⁺	1.40	2.14 [*]	1.40	1.91 ⁺	1.20	1.00	1.16	1.09
Employee, mis. details	0.78	0.99	0.69	1.13	0.59	1.06	—	—	—	—
N (couple-years)	4728		3744		4728		4944		4118	4950

B birth, D dissolution; Model 3 includes control variables as in Model 2 plus labour income, marital status and work satisfaction for both partners; ⁺ $p < 0.10$; ^{*} $p < 0.05$; ^{**} $p < 0.01$; ~ cell size below 30 cases

5.3 Robustness Checks

Table 4 presents results from three modified versions of Model 2 that were estimated to test the robustness of the results. First, several control variables were added to Model 2, namely marital status, labour income and job satisfaction (Model 3). While possibly important predictors of the risks of first birth and/or dissolution, these characteristics were not included in the main specification given their potential endogeneity: Non-standard employment may reduce the marriage risk, income, and job satisfaction, and these factors may in turn reduce the first birth risk or increase the dissolution risk. If this mediating effect was large, we would expect the hazard ratios for the employment types to change once these factors are accounted for (that is, hazard ratios for first birth should become larger, and those for dissolution smaller). The comparison of Model 2 with Model 3, however, shows that the changes are relatively small, with noteworthy exceptions being the reduction in the hazard ratio of dissolution for male agency workers in Germany from 1.88 ($p < 0.05$) to 1.69 ($p < 0.05$) and for female casual full-time workers in Australia from 2.03 ($p < 0.05$) to 1.89 ($p < 0.10$). This robustness of results suggests that non-standard employment is (also) linked to partnership transitions through other channels besides the characteristics added in Model 3 (e.g. job and career insecurity).

Second, Model 2 was re-estimated including only women up to age 35 (Model 4). We may expect employment type to have higher importance for fertility decisions for younger women as they have more time to postpone entrance into motherhood. Again, the results are similar to Model 2, but some effects of temporary employment indeed become stronger. For example, the association of fixed-term full-time work with the first birth risk of German women becomes statistically significant, with the hazard ratio changing from 0.80 to 0.72 ($p < 0.10$), and the hazard ratios for dissolution among German male and female agency workers and Australian male casual part-time work become larger.

Finally, Model 2 was re-estimated after re-classifying all workers who are also in education as “in education” (Model 5). It is not self-evident which employment status should be assigned to persons who work and study at the same time. On the one hand, it is well known that educational participation decreases fertility, suggesting that working students should be classified as “in education”. On the other hand, it is likely that many (especially non-standard) workers study on the side because they are dissatisfied with their jobs and wish to improve their career perspectives, suggesting that working students should be classified as workers. The results show that once all working students/studying workers are taken out of the employment categories, several associations become weaker and/or statistically insignificant. For example, the hazard ratio for first birth among German female agency workers changes from 0.45 ($p < 0.10$) to 0.64. However, some of

the change in the associations may simply be attributable to the reduction in cell size among the employment categories.¹⁵

6 Conclusion

This study has used couple data from two large-scale household panels to investigate the impact of non-standard employment on first birth in Australia and Germany. It extends past studies by simultaneously considering couples' risks of first birth and of partnership dissolution. Further, it considers a broader range of employment types than previous studies and is the first to provide evidence on the fertility impact of temporary employment in Australia.

The results show some commonalities for the two countries regarding the effect of non-standard employment on first parenthood. Most importantly, temporary employment, and especially temporary agency work, proved to be detrimental for first birth risks for women, but not men, in both countries. The job insecurity connected to temporary employment may prevent workers from making long-term commitments and instead lead them to invest heavily in their jobs in order to receive a permanent contract before family formation. Agency work, in particular, may inhibit long-term planning through frequent changes of workplaces and schedules and a high risk of unemployment. That temporary contracts are only detrimental for women reflects the dominance of the modified male breadwinner model in the two countries. Mothers, as designated primary carers, are much more likely than fathers to interrupt employment after a birth, but taking parental leave on a temporary contract bears the risk of job loss. Thus, a permanent contract seems particularly important for women to facilitate their labour market re-entry.

Further, in both countries part-time working hours appeared to be beneficial for entry into motherhood, but primarily in combination with a permanent contract. For mothers as primary carers, part-time work alleviates the time conflict between the demands of work and family. However, only if the position comes with a permanent contract do women have the guarantee to be able to return to this position after parental leave.

The study also highlights some differences in the effects of non-standard employment in the two countries, which can be traced back to differences in institutional settings, that is, employment and welfare regimes. For example, temporary contracts appeared to be more detrimental for German than Australian women, suggesting that a job guarantee during parental leave may be more important in a context of relatively high EPL for permanent jobs and high unemployment as in Germany in the 2000s. Part-time work appeared to be more beneficial for childbearing for Australian than German women, indicating that high childcare costs may render mothers more dependent on the availability of part-time hours to remain employed. It also

¹⁵ It should be noted that the negative association of the broad category of temporary employment with women's first birth risk (Model 1) remains statistically significant in both countries even if all working students are classified as "in education".

suggests that earnings-based PPL, as is offered in Germany since 2007, motivates women to seek full-time positions prior to a birth. Part-time work among men, in contrast, hampers first birth in Australia but not in Germany. This may be traced back to the lower level of state support for working mothers in Australia (most notably, the lack of PPL for most part of the period), putting pressure on men as primary breadwinners to compensate for the income lost when their partners interrupt or reduce employment after a birth.

The study additionally shows how fertility may be influenced indirectly by non-standard employment through partnership stability. Some forms of non-standard employment, for example, temporary agency work among German women and part-time work among Australian men, have a dual negative impact on fertility by simultaneously reducing the risk of first birth among (stable) couples and increasing the risk of partnership dissolution.

The study has some limitations. With limited sample sizes, the number of observations for some groups (especially male fixed-term part-time workers) was small. Sample size also prevented investigating potential differences in the effects of non-standard employment for different subgroups of workers, for example, with different skill or income levels, or for different sub-periods. Further, the study was unable to account for unobserved heterogeneity for lack of a convincing fixed-effects approach in event history analysis of non-repeatable events (Andress et al. 2013). Also, the study has not empirically addressed selection into employment types. Causal inferences of the impact of non-standard employment on fertility would be misleading if workers were selecting into these employment types according to their childbearing plans. However, it can be expected that temporary forms of employment are in most cases taken up involuntarily as most workers would prefer permanent jobs (Giesecke 2009; Morris and Vekker 2001), suggesting that temporary employment affects partnership transitions rather than the other way around. As discussed in the theory section, this is not as clear-cut with part-time work: Women as primary carers might select into part-time work with a view to balance work and future family responsibilities.

Overall, the study has highlighted a potential dual impact of non-standard employment on couples: They often have a lower risk of first birth and/or an increased risk of partnership dissolution. The results call for policy solutions reconciling the demands of flexible labour markets with individuals' need for a secure employment career and financial foundation for stable couple relationships and parenthood. Specific policy measures would need to be tailored to the different institutional contexts. Possible avenues could include fostering permanent employment among women in both countries to facilitate labour market re-entry after a birth or increasing support for working parents through higher PPL and lower childcare costs in Australia to relieve new fathers from their breadwinner role.

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Compliance with Ethical Standards

Conflict of interest The author declares to have no conflict of interest.

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