## Decomposing Fertility Rates in Australia: The Impact of changing relationship patterns and increasing singlehood

### Introduction

The majority of human births take place within a couple relationship. This is a fact that has held true throughout modern history and across societies. Recent estimates from English-speaking and European countries highlight that on a national scale, most children are born to cohabiting or married parents. Examples include: the United Kingdom in 2021, where 85% of births were to parents who live at the same address, (Office of National Statistics, 2023), Spain in 2014, where 88% of births were to cohabiting or married parents (Cortina, et al 2017), 84% in the United States between 2014-2018 (Guzzo, 2021), and 84.5% in Iceland in 2016 (Statistics Iceland, 2017).

The fundamental link between relationships and fertility, was clearly identified by Boongarts (1978) who referred to the proportion of women in a consensual union in a population as one of the proximate determinants of fertility. Unlike indirect effects such as education or income, a proximate determinant is one which has a direct relationship with fertility. As such, differences in fertility between countries, or within countries over time, can be explained by variations in these proximate determinants. Specifically, the proportion of women in a consensual union was identified as determining what proportion of the population was exposed to the risk of childbearing.

In many countries there has been an increase in the proportion of the population of childbearing age that is single at any one point in time. The trend in increasing singlehood has been most prominent in the East-Asian region (Jones, 2018; Esteve et al., 2020) but is also evident in Europe (van de Berg & Varbakel, 2022), the United States (Fry & Parker 2021) and also in Australia. In Australia, according to Census data, in the 30 years between 1991 and 2021, the percentage of women aged 25-39 who were not living with a partner, either in a cohabitation or marriage, grew from 26% to 34% (Australian Bureau of Statistics 1991; 2021). This increase could be due to a combination of factors including an increase in the proportion permanently single, increasing age at forming first unions, and relationship instability (Bergström & Moulin, 2022; Billingsley & Oláh, 2022).

We can think of childbearing process in a simplified way as a two-stage process. The first stage is establishing a relationship, and the second stage is having a child within that relationship. At the macro-level, fertility is determined by the proportion of the population that is partnered, as well as the fertility rate among those who are partnered. Fertility may decline if individuals in relationships have fewer children and/or there are fewer people in relationships. All other things being equal we would therefore anticipate a change in the proportion of the population who are partnered to have an effect on the overall level of fertility. However, despite relationships being a basic prerequisite for childbearing, there is scant evidence for the role that changing relationship trends, and in particular increasing rates of singlehood, may have had on overall fertility levels in developed countries.

Research into the link between relationship patterns and overall fertility at a national level has been hampered by the fact that data on the relationship status of mothers giving birth is not widely available. Most statistical agencies still only report births as occurring either within marriage or outside of marriage (Hoem, et al 2003; Laplante & Fosik 2015). In countries where ex-nuptial fertility is negligible this dichotomous categorisation of births as being within our outside of marriage is acceptable. However, in countries across Europe and Latin America where births in cohabiting unions have become more common and socially acceptable (Laplante, et al 2016) the dichotomous characterisation of births

as occurring within or outside of marriage presents a problem. In recent decades many countries have experienced a large increase in births born outside of marriage. Among OECD countries, an average of 23% of births were to mothers who were not married in 1995. By 2020 this had increased to 42% of babies born outside of marriage (OECD 2023). In several European and Latin American countries including Chile, Costa Rica, Mexico, Iceland, France, Bulgaria, Slovenia, Estonia, Sweden, Denmark, Norway, Portugal, and the Netherlands births outside of marriage now outnumber births born within marriage (OECD 2023; Eurostat 2023). Without knowing what proportion of these ex-nuptial births are born to parents in a union versus single mothers, then in countries where a large proportion of births are born to cohabiting parents, it is impossible to determine how fertility has changed at a macro or national level as a result of changing relationship patterns.

Recently, there have been renewed calls to consider partnership formation patterns as a key explanation for differences in fertility over time, or between countries (Esteve, et al 2020; Billingsley & Oláh 2022; Boissonneault & de Beer 2022; Beajouan 2023; Rahnu & Jalovaara 2023). In this paper we take up this call and explore how Australian fertility rates from 1991 to 2019 have been affected by changing relationship patterns, and in particular the increasing rate of singlehood. Birth registration data from the Australian Bureau of Statistics (ABS), and a customised dataset of perinatal statistics provided by the Australian Institute of Health and Welfare (AIHW), are used to investigate how childbearing has varied over time due to changing relationship patterns in the population, and to decompose overall fertility into fertility at different ages and relationship states.

## Background

A variety of approaches and types of data have been used to look at the role that relationship patterns play in determining fertility at the micro and macro-level. The fundamental link between relationships and childbearing has been well established at the individual level. At the micro-level relationship status is often included as an independent variable in fertility studies but researchers have also more explicitly focused on the relationship status, both when looking at the start of the childbearing, timing of last birth, childlessness, and completed fertility. At the macro-level there is much less research due to aforementioned lack of data.

Individual level data has been used to look at the start of the childbearing process, and the link between relationships and the transitions to first birth. Examining the timing of first births, using Australian survey data, Lazzari (2022) found a strong association between being married and a faster transition to first birth for both men and women. Also using survey data, from Sweden and Spain, Nishikido, et al (2022) investigated how relationship formation differences may explain differences in the transition to first birth between the two countries. In Sweden women were more likely to form stable relationships earlier compared to their Spanish counterparts, and also more likely to transition to motherhood at a faster rate. The authors concluded that before age 30, 74% of the difference in first-birth transitions between the two countries could be explained by differences in the relationship composition of the female population. Finnish register data was used to investigate the role of changing relationship patterns on first birth rates between 2010 and 2018 (Hellstrand, et al 2022) with the authors concluding that lower fertility in unions explained around three-quarters of the total decline in first births during that period.

The link between relationships and fertility has also been established at the individual level by researchers looking at the other end of the reproductive life, including indicators such as completed fertility and childlessness. The number of years lived without a partner—whether having never had a partner, or due to a series of short partnerships —has

consistently been found to be strongly associated with ending the reproductive life childless (Netherlands (Keizer, et al . 2008), Germany (Raab & Struffolino, 2020), and Finland (Jalovaara & Fasang 2017; Saarela & Skirbekk, 2020)). Micro-level data highlight that lack of stable partnerships are a primary reason why people may not fully realise their fertility intentions and have fewer children than they would ideally like to have (Heard 2007; Skirbekk 2022).

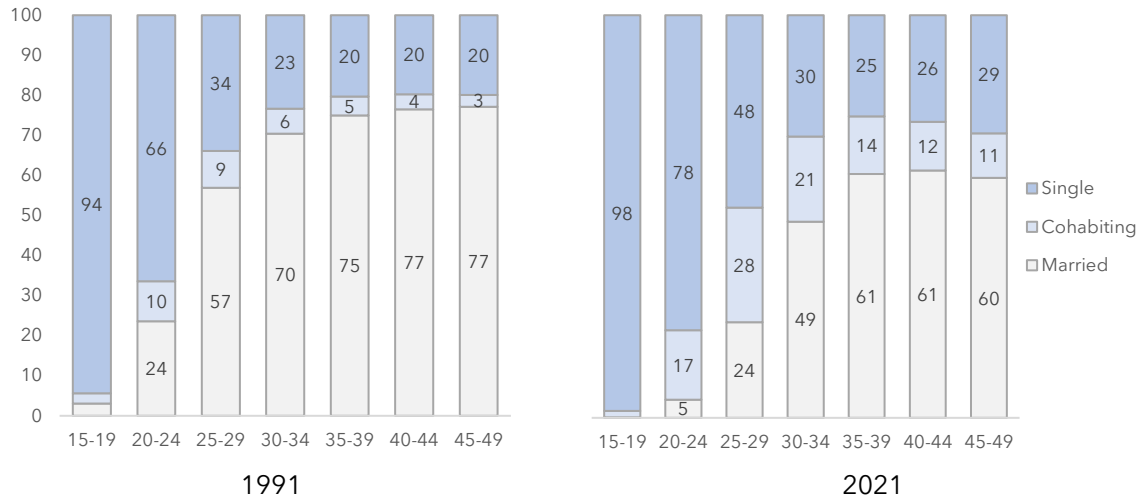
In comparison to the abundant research establishing the role of partnerships and fertility at the micro-level, there is very little research estimating the effect of relationship status on overall fertility, either over time or across countries. This is primarily due to a lack of data availability and specifically due to an absence of birth data that categorises births by mother's relationship status including whether she is partnered or not, and not just whether she is married or not. In countries where ex-nuptial fertility is negligible researchers have successfully been able to show how fertility has changed due to changing marriage patterns as well as changing levels of marital fertility in nations. Raymo et al. (2015), for example, emphasised how shifting marriage patterns have impacted TFR in Japan and South Korea, yet conditional on marriage, completed fertility has stayed consistently near replacement level in both countries. Similarly in China, Jiang, et al (2019) analysed how the change in fertility between 1989 and 2010 was due to both changing marital fertility and a change in the proportion of married women.

Some work on the contribution of marital and cohabiting fertility to overall fertility has been done by Laplante, Fostik and colleagues. Using the own-child method of indirect estimation on census data, Laplante and Fostik (2015) compared fertility by relationship status in Quebec and Ontario from 1986-2006. They found that over time the fertility within cohabitation increased dramatically, especially in Quebec. In Latin-American countries (Laplante, et al 2016) found the contribution of cohabitation to overall TFR has also changed over time and while in some countries marital fertility is the largest contributor of fertility to TFR, in others the contribution of cohabiting fertility to overall fertility is higher than that of marital fertility. The studies that have looked at overall fertility have done so with a focus on examining what contribution marital or cohabiting fertility has had on the total fertility rate, and less focus on how the changing composition of the population in terms of their relationship status has effected fertility.

**Australian relationship and fertility trends.**

In Australia, the proportion of the population in childbearing ages who are single at any given time has increased. In 1991, around half (54%) of women aged 15-49 were married. By 2021 only 38% of women in this age range were married. However, this decline in the proportion of women married was partially offset by an increase in unmarried cohabitation. Between 1991 and 2021 the percentage of women of childbearing ages living with a partner but not married, increased from 6% to 16%. As seen in Figure 1, cohabitation has become an increasingly common living arrangement particularly in the late 20s and early 30s. The increase has not been enough to completely offset the decline in marriage leading to an overall increase in singlehood. This increase is evident at all ages.

Figure 1 Percentage distribution of women aged 15-49 by relationship status, 1991 & 2021 Census




Source: Australian Bureau of Statistics, 1991 and 2021 Census

There is little information known about the reason for the increase in singlehood in Australia. The main theoretical explanations would be an increase in the age at forming first unions, as well as an increase in relationship instability (Bergström & Moulin, 2022; Billingsley & Oláh 2022). It is likely that both these factors are at play although there is no research available on trends in age at forming first unions in Australia, or on trends in relationship dissolution rates which take into account both marriage and cohabitation. In other countries such as France (Bergström & Moulin, 2022) the United States (Bloome & Ang 2020), and England and Wales (Pelikh, et al 2022), age at first union formation has increased so it is very likely to be a factor in Australia. We also know from cohort studies in England and Wales (Pelikh, et al 2022), the United States (Dush, et al 2018; Eickmeyer 2018) and Finland (Jalovaara & Andersson 2023) that there has been an increasing trend among more recent cohorts for union dissolution.

## Fertility trends

Turning to fertility trends, the experience of Australia in recent decades reflects similar trends to many other English-speaking and European countries. Fertility has declined over time and there has been a shift of childbearing to later ages. In the last 50 years the total fertility rate (TFR) has declined from a peak of 2.95 in 1971 dropping sharply to 1.89 by 1980. Since then it has remained below 2 children per woman, with the exception of a peak of 2.02 in 2008. Since 2008 it has declined steadily reaching 1.67 in 2019 (Australian Bureau of Statistics 2022). The decline in fertility can also be seen when looking at the completed cohort fertility rate of women aged 40-44, which dropped from 2.46 in 1986 (Heard & Arunchalam 2015) to 1.89 in 2021 (Australian Bureau of Statistics 2021). Women are also having children at later ages. In 1991, just 23% of first births were to mothers aged 30 and over but by 2020 this had increased to 53% (Qu & Baxter 2023)

There has also been a change in the relationship context in which children are born. Previously childbearing happened almost exclusively within marriage, but childbearing outside of marriage has become increasingly common. The percentage of all births in a given year who are born outside of marriage has increased from 11% in 1975 to 23% in 1991 and 38% percent in 2021 (ABS 2023). While it is generally agreed that this increase is due to an increase in births occurring to cohabiting parents rather than an increase in births to single mothers (Qu & Baxter 2023), to date it has not previously been possible to

establish if that is the case. There has only been one direct estimate of what proportion of births are to married, cohabiting and single mothers in Australia. Using survey data from the Household Income and Labour Dynamics in Australia, de Vaus & Gray (2004) estimated that of children born in 2001, 11.6% were born to single mothers.

Using newly available data which identifies births by whether the mother was in a union or single at the time of the birth, we investigate what the contribution of marital, cohabiting and single fertility has been on the total fertility rate over time, and what contribution the increasing rate of singlehood has had on overall fertility.

**Data**

To decompose the effect of changing relationship patterns on overall fertility, two main pieces of information are needed:

1. Distribution of women by age and relationship status
2. Distribution of births by mother's age and relationship status

While we have data available up to, and including 2020, due to the distribution in both childbearing and relationship formation patterns brought on by the COVID-19 pandemic we restrict our analysis to the period between 1991 and 2019.

The distribution of women by age and relationship status is available from the 5-yearly census in Australia using data from 1991, 1996, 2001, 2006, 2011, 2016 and 2021. Given that social change, such as changing relationship trends occur slowly over time we are able to interpolate between census years to derive a complete picture of changing relationship trends from 1991 to 2019.

The distribution of births by mother's age and relationship status is derived from registration data as well as from data from the perinatal statistics. The registration data, available from the Australian Bureau of Statistic (ABS) categorises births by the mother's age as well as whether or not they occurred within marriage or outside of marriage. Data from perinatal statistics, provided by the Australian Institute of Health and Welfare (AIHW) as a customised dataset, divide births by the age of the mother as well as whether she was partnered (married or cohabiting) or single at the time of the birth. For some states and years, data on the mother's relationship status at birth was missing in the AIHW dataset. In cases of missing data, this was imputed using multiple imputation using additional information on age-specific fertility rates and proportion of women in partnerships.

Subtracting the married births from the partnered births we are able to divide births into three categories of the mother's marital status at the time of the birth: married, cohabiting, or single.

**Method**

To examine trends overtime in fertility by relationship status we use a formula where TFR is expressed as the sum of a series of contributions from age-specific fertility in different relationships statuses.

$$TFR = \sum_{x=15-19}^{45-49} p_{rx} ASFR_{rx} = \sum_{x=15-19}^{45-49} p_{rx} \frac{b_{rx}}{w_{rx}}$$

Where $p_{rx}$ is the proportion of women in relationship status *r* (married, cohabiting or single) at age *x*, $b_{rx}$ is the number of births to women in relationship status *r* at age *x*, and

$w_{rx}$ is the number of women aged x in relationship status *r*. This gives $p_{sx}ASFR_{rx}$ which is the contribution of a given relationship status to the overall ASFR (and TFR).

While this formula allows us to look at overall trends overtime, and investigate what contribution fertility in a particular relationship status has had on overall TFR, to decompose changes in fertility according to changes in relationship-specific fertility patterns, and changes in the composition of women by relationship status we use the Das Gupta (1993) decomposition method to separate changes in TFR into rate effects and a composition effect.

Change in TFR over time, between 1991 and 2019 is expressed as a rate effect and a composition effect. The change in TFR between 1991 and 2019 is a function of the change in the proportion of women in a given relationship status multiplied by the sum of average relationship specific ASFRs (rate effect) and the average proportion in a particular relationship status multiplied by the sum of the changes in relationship specific ASFRs (composition effect). We do this for partnered versus unpartnered women and can further break it down into married (m), cohabiting (c) and single (s).

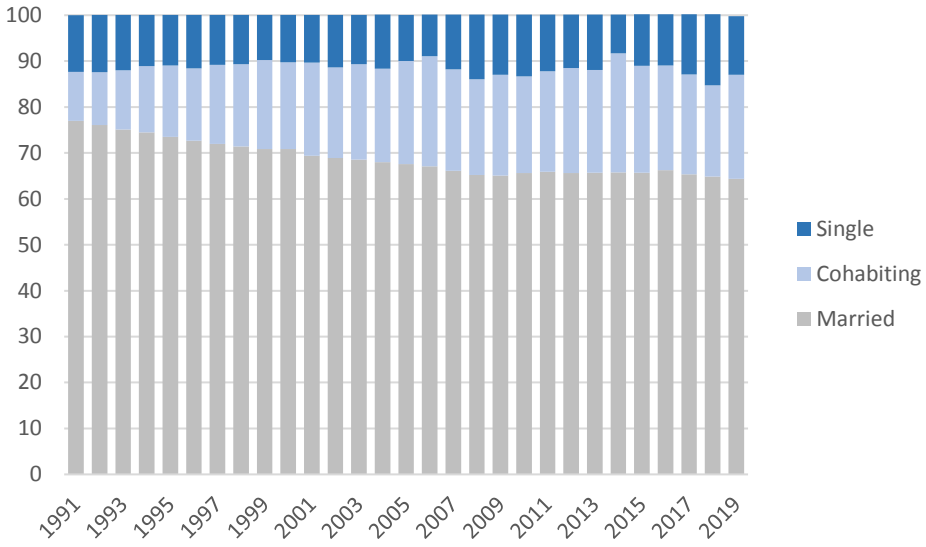
$$\Delta TFR_{1991-2019} = \sum_{x=15-19}^{45-49} \Delta p_{rx}\overline{ASFR}_{rx} + \overline{p_{rx}}\Delta ASFR_{rx}$$

$$=\sum_{x=15-19}^{45-49} \Delta p_{mx}\overline{ASFR}_{mx} + \overline{p_{mx}}\Delta ASFR_{mx} + \Delta p_{cx}\overline{ASFR}_{cx} + \overline{p_{cx}}\Delta ASFR_{cx} + \Delta p_{sx}\overline{ASFR}_{sx} + \overline{p_{sx}}\Delta ASFR_{sx}$$

## Results

We start by examining the overall distribution of births by mother's marital status at time of birth between 1991 and 2019, as shown in Figure 2. Throughout the period, the majority of births have been born to married mothers. The proportion of births to married mothers has declined from 77% in 1991 to 64% in 2019, while there has been a corresponding increase in the proportion of births to cohabiting mothers, from 11% to 23%. As a result the overall percentage of births to partnered mothers (cohabiting and married) has remained relatively stable over time at around 85-90%.

Figure 2 Distribution of births (%) by mother's relationship status at birth 1991-2019




The relationship context of the birth is not surprisingly highly dependent on the mother's age, as seen in Table 1 which compares the relationship status of births by the mother's age in 1991 and 2019. In 1991, childbearing was more highly concentrated in the younger age groups. Just over one quarter of births were to women aged 24 or younger in 1991, falling to 13% by 2019. At these ages, births to single women were more common than at older ages, but as the percentage of births to young women has declined the percentage born to single mothers has increased. As age increases the percentage who are born to married mothers also increases, except for in the last age group where an increasing proportion of births are to cohabiting relationships. This is possibly due to repartnering with women in their 40s having ended a previous relationship and started childbearing in a new cohabitation.

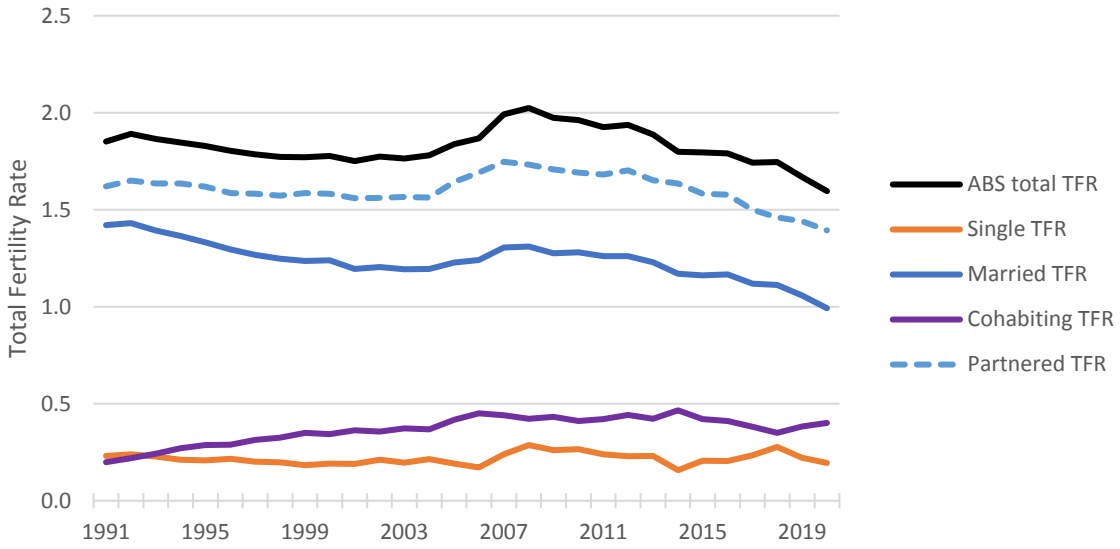
Table 1 Distribution of births by mother's age, 1991 & 2019

| | | Mother's age | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Relationship status (%) | **15-19** | **20-24** | **25-29** | **30-34** | **35-39** | **40-44** | **Total** |
| 1991 | Married | 18 | 60 | 85 | 88 | 86 | 81 | 77 |
| | Cohabiting | 29 | 19 | 7 | 6 | 7 | 14 | 11 |
| | Single | 53 | 21 | 8 | 6 | 7 | 4 | 12 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | % of all births at this age | 6 | 20 | 36 | 28 | 9 | 1 | |
| 2019 | Married | 5 | 27 | 61 | 76 | 74 | 65 | 64 |
| | Cohabiting | 32 | 40 | 25 | 16 | 19 | 31 | 23 |
| | Single | 63 | 33 | 14 | 7 | 7 | 4 | 13 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | % of all births at this age | 2 | 11 | 26 | 36 | 20 | 4 | |

Next we turn to the overall contribution of childbearing within different relationships to the TFR is shown in Figure 3. As expected, the contribution of married fertility to TFR has

declined, but the contribution of cohabiting fertility has increased and overall partnered fertility (cohabiting and married) has remained relatively stable.

Figure 3 Relationship specific TFR, 1991-2019




The above analysis illustrates how childbearing within cohabitation has become increasingly common, while having a child within a marriage has declined. Overall childbearing outside of a union has remained a stable and small contributor to overall fertility. However this analysis does not tell us how this relates to the changing composition of the population by relationship status. For this we turn to the decomposition analysis below, comparing 1991 and 2019.

We carry out two decomposition processes. The first separates out the population into partnered versus single women, and the second further separates out partnered women into married or cohabiting. The results of both models are shown in Table 2, although the discussion below focuses on the decomposition of partnered versus unpartnered women as this is our main interest.

In 1991, TFR was 1.85 and by 2019 it had declined 1.67. This decline of 0.18 can be separated into the effect of changing fertility rates within each partnership status, and changing composition of women within each partnership status. Of the total TFR decline of -0.18, we find that the changing composition of women in terms of the increasing proportion who were single contributed -0.286 to the decline in TFR, while changing fertility rates within the different relationship status contributed 0.053. The effect of fertility rate changes, composition rate changes, and the overall change can be seen in Figures 4, 5 and 6.

Starting with changes in fertility rates we see that the relatively modest overall contribution of changing rates of 0.053 was due the fact that large negative contributions at the younger ages were balanced by positive contribution, or increasing fertility rates, at the older ages, as seen in Figure 4. This is representative of the increasing age at birth and shift in childbearing from younger to older ages in Australia. The changing rate is evident among both single and partnered women, although overall the contribution of single women is minimal.

While the effect of partnered fertility had a negative effect at younger ages, counterbalanced by a positive effect at older ages, in contrast, the changing composition of partnered versus single women contributed to a negative effect at all ages (Figure 5). The contribution to the changing TFR from the changing composition of women based on whether they were partnered or not was negative at all ages although the largest negative contribution was in the younger ages, particularly in the 20s.

Looking at the relative contribution of rates and composition changes (Figure 6) we see that overall the rate effect dominated but particularly in the 20s the effect of the changing composition of women was also significant. At ages 25-29, around one third of the decline in fertility at this age was due to the changing composition of the population and the increase in proportion single.

Investigating the changing rates and composition for married, cohabiting and single women in more detail (Table 2) we find that among women aged 20-24 and 25-29, the decline in proportion married between 1991 and 2019 had a large negative contribution on the overall fertility rate, which was only partially offset by the increase in the proportion of women cohabiting.

*Figure 4 Contribution of changing fertility rate on TFR 1991-2019*

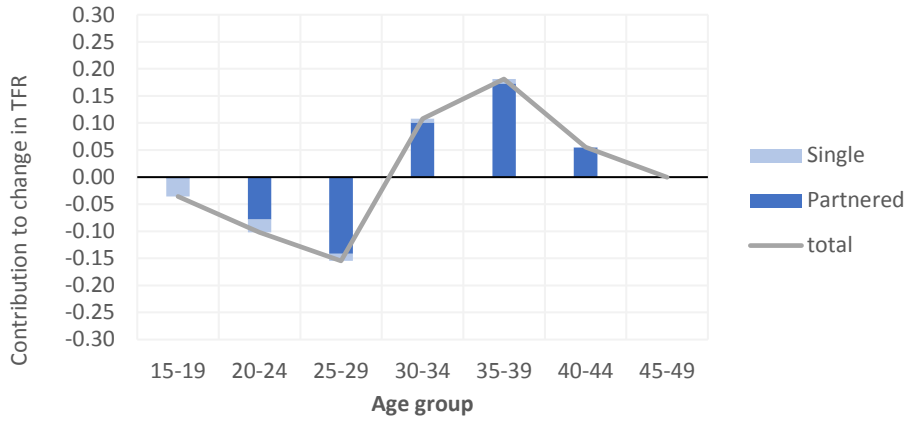



*Figure 5 Contribution of changing composition of women on TFR 1991-2019*

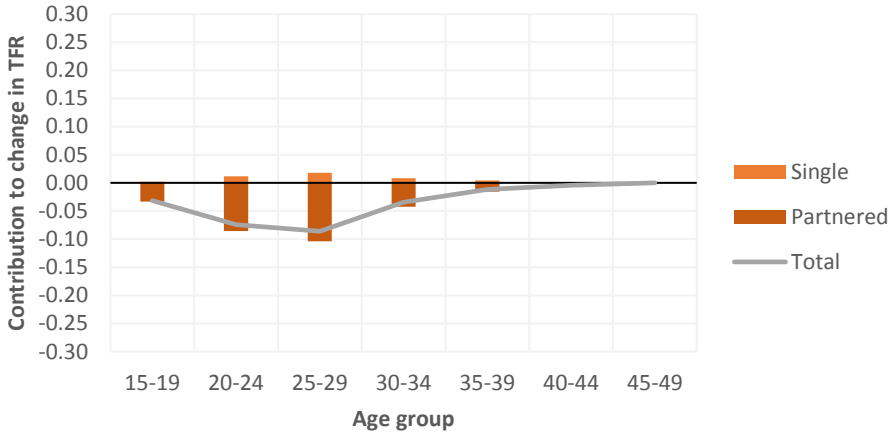



*Figure 6 Contribution of composition and rate effect for decline in fertility between 1991 and 2019*

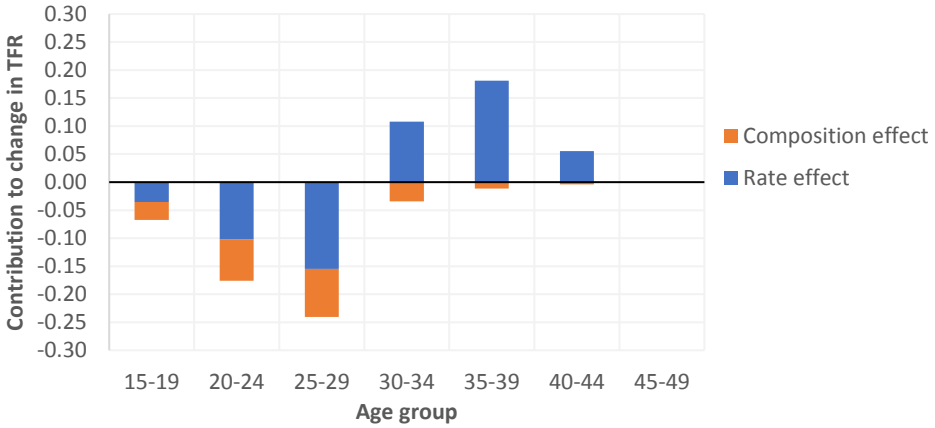


*Table 2 Contribution of rates and composition to change in TFR (1991-2019) by age group*

| | | Single | Married | Cohabiting | Partnered | Total (Single, Married, Cohabiting) | Total (Single, Partnered) |
|---|---|---|---|---|---|---|---|
| 15-19 | Proportion | 0.002 | -0.027 | -0.009 | -0.033 | -0.035 | -0.032 |
| | Rate | -0.033 | 0.010 | -0.009 | -0.002 | -0.032 | -0.035 |
| | Total | -0.031 | -0.018 | -0.018 | -0.036 | -0.067 | -0.067 |
| 20-24 | Proportion | 0.011 | -0.181 | 0.040 | -0.086 | -0.129 | -0.074 |
| | Rate | -0.024 | 0.010 | -0.033 | -0.078 | -0.047 | -0.102 |
| | Total | -0.012 | -0.171 | 0.007 | -0.164 | -0.176 | -0.176 |
| 25-29 | Proportion | 0.018 | -0.295 | 0.080 | -0.104 | -0.197 | -0.086 |
| | Rate | -0.013 | -0.007 | -0.023 | -0.141 | -0.044 | -0.155 |
| | Total | 0.005 | -0.302 | 0.056 | -0.245 | -0.241 | -0.241 |
| 30-34 | Proportion | 0.008 | -0.143 | 0.065 | -0.042 | -0.070 | -0.034 |
| | Rate | 0.007 | 0.138 | -0.001 | 0.101 | 0.144 | 0.108 |
| | Total | 0.015 | -0.005 | 0.064 | 0.059 | 0.073 | 0.073 |
| 35-39 | Proportion | 0.004 | -0.044 | 0.034 | -0.016 | -0.007 | -0.011 |
| | Rate | 0.008 | 0.148 | 0.020 | 0.173 | 0.176 | 0.181 |
| | Total | 0.012 | 0.104 | 0.054 | 0.158 | 0.170 | 0.170 |
| 40-44 | Proportion | 0.001 | -0.009 | 0.013 | -0.005 | 0.005 | -0.004 |
| | Rate | 0.001 | 0.038 | 0.008 | 0.055 | 0.047 | 0.056 |
| | Total | 0.002 | 0.029 | 0.021 | 0.050 | 0.052 | 0.052 |
| **Total** | Proportion | **0.044** | **-0.699** | **0.222** | **-0.286** | **-0.433** | **-0.242** |
| | Rate | **-0.054** | **0.337** | **-0.039** | **0.107** | **0.244** | **0.053** |
| | Total | **-0.010** | **-0.363** | **0.184** | **-0.179** | **-0.189** | **-0.189** |

## Discussion

Given that being in a relationship is generally seen as a pre-requisite to childbearing, we can think of a country's fertility rate as being influenced by the level of childbearing within partnerships, as well as the proportion of the population that is partnered. In Australia, the percentage of the population that is not in a partnership has increased substantially in recent decades. Our aim in this paper was to examine what effect this increase in singlehood may have had on the overall fertility trends.

The first step was to establish fertility levels of partnered versus single women. This had previously not been possible to do due to lack of suitable data. Using perinatal statistics from 1991-2019 which categorised births according to whether the mother was partnered or not, we were able to establish that as seen in other Western countries, overall the vast majority of births in Australia (around 87% in 2019) are to partnered mothers. The proportion of births to single mothers has remained relatively stable over time, although there has been changes in the proportion of births to single mothers across different age groups. For example, as the childbearing in the early 20s has become less common the percentage of births to single mothers in this age group increased.

In terms of relationship specific fertility rates we found that while the contribution of marital fertility to TFR has decreased over time, the contribution of cohabiting fertility has

increased, meaning that the overall fertility of partnered persons has remained relatively stable over time, even increasingly slightly.

Our decomposition analysis examined how the changing composition of the female population by relationship status, as well as fertility within different relationship status effected overall fertility. We found that in terms of fertility of partnered women, there was a shift from younger to older ages but not an overall decline. Indeed in terms of the rate change this had a positive effect on overall fertility. However, across all age groups the changing composition of women and the increase in the proportion who were not partnered had a negative contribution, especially at the younger ages. Taken together this suggest that among those in a relationship, fertility rates have not changed substantially except for a shift from younger to older ages. However, what has changed is the proportion who are in a partnership.

Although we are able to establish that the decline in percentage of partnered women has had a negative effect on overall fertility at the macro-level our broad categorisation of single versus partnered women does provide enough detail to further unpack the link between singlehood and fertility. Among our single population we are not able to see what percentage have never partnered, or who have previously partnered but are now separated. As discussed, an increase in the proportion of the population who are single can be due to an increase in the proportion permanently single, an increase in age at forming first unions, or an increase in relationship dissolution. The effect of each of these factors would have a different impact on fertility. An increase in permanent singlehood is likely to have a negative effect on overall fertility, while an increase in age at union formation would also lead to a delay in the transition to first birth and a compression of the time available for childbearing (Beaujouan 2023). Lastly, an increase in relationship dissolution may have opposing effects due to repartnering (Ivanova, et al 2014; Andersson et al 2022), although the effect on overall national fertility may be small (Beaujouan 2010).

In Australia there has been little research on the extent to which increasing singlehood at different ages is due to changes in age at union formation, or changes in relationship dissolution rates. Particularly for changes in age at union formation more investigation is also needed to establish the socio-economic causes of this and in particular in relation to the housing market, education and changing labour markets.

The reasons behind increasing singlehood are complex and multi-faceted with several theoretical explanations. One reason, especially to explain the increase in age at first union formation is that increasing rates of education and university attendance have led to a consequent postponement of labour market entry and therefore ability to be economically self-sufficient and afford independent living (Buchmann & Kriesi 2011). This may be exacerbated by increasing poor employment prospects and the casualisation of the labour market which can make it difficult to secure a stable full-time job.
This has resulted in a general increase in age at leaving home, a pattern which can be seen across many Western countries including in Australia. For example, in 2001 around 36% of women aged 18-29 were living with their parents, increasing to 54% in 2017 (Wilkins and Vera-Toscano 2019).

However, as cross-national research has highlighted, these trends only partly explain the trend. In many Southern European countries for example, young men especially stay living with their parents for many years after entering the labour market and becoming financially dependent due to a variety of reasons such as strong reliance on family, little government support, and a limited renting sector (Buchmann & Kriesi 2011; Corijn &

Klijzing 2001). In contrast, in countries with a strong and more affordable rental sector, with welfare regimes oriented towards the individual and weaker family ties (Buchman & Kriesi 2011) it is possible to leave home much earlier. Decoupling of leaving home and entering first union differ across countries (Corijn and Klijzing 2001). For example in 2011 in Denmark, 50% of among 20-34 year olds are living with a partner, and of the other half of the population that is single, just 11% live with their parents. In contrast in Italy, in the same age range 71% of the population is single, and of those who are single 54% are living with their parents (OECD 2023)

Another important explanation is the ideational and cultural shift towards individualisism and self-actualisation, as outlined in the Second Demographic Transition Theory (van de Kaa 2002). Using the concept of Gidden's (1991) 'pure relationships' we can view modern union formation as more egalitarian and entered into and exited through choice. Relationships are initiated and kept going for as long as they provide emotional satisfaction and are sought out (p. 89). These relationships are a site for self-actualisation, and where couples who live together negotiate, define, monitor and justify the characteristics of their relationships (Hall 2003). These shifts can lead to higher expectations for future partners and a consequent extended time in searching for a partner (Billari & Liefbroer 2010; Skirbekk 2022) but also increase the instability and risk of relationship dissolution.

Others emphasise the importance of changing gender dynamics which may affect willingness of women to enter relationships as well as the availability of suitable partners. Women's educational gains and increasing labour force participation have had an empowering effect and reduced the need to enter relationships due to economic reliance on the male wage. This has raised their expectations for their marriage and their partners (Skirbekk 2022). In countries where women have higher education levels than men, and men's wages have stagnated there may also be partner market effects and a shortage of 'attractive' partners to choose from (Jones 2018; Skirbekk 2022).

When looking at fertility trends over time or between countries we believe it is useful and important to distinguish between factors that may impact fertility through their role on effecting union formation (for example housing affordability or longer time spent in education) and factors which may influence fertility within partnerships (such as declining childbearing desires, cost of children, difficulties balancing work and family in dual-income households, availability of childcare and parental leave). As Esteve, et al (2020) note it is only it is through living independently and having a stable partnership that other social and economic changes affect fertility. This also applies to policies to support childbearing. While policies related to childcare provision and parental leave support can support the childbearing of those within couples, there are a variety of ways in which union formation can be supported. While some countries such as Singapore have attempted specific programs such as developing dating programmes to help singles find a partner (Chen, et al 2018) general policies to support young people in terms of housing, and secure labour market opportunities may indirectly impact fertility through their role in assisting with union formation.

## References


Aassve, A., Cottini, E., & Vitali, A. (2013). Youth prospects in a time of economic recession. *Demographic Research*, *29*, 949-962.

Andersson, L. (2023). A Novel Macro Perspective on Family Dynamics: The Contribution of Partnership Contexts of Births to Cohort Fertility Rates. *Population and Development Review*.

Andersson, L., Jalovaara, M., Uggla, C., & Saarela, J. (2022). Less is more? Repartnering and completed cohort fertility in Finland. *Demography*, *59*(6), 2321-2339.

Australian Bureau of Statistics (1991). Australian Census 1991.

Australian Bureau of Statistics (2021). Australian Census 2021.

Australian Bureau of Statistics (2022). Births, Australia 2021. https://www.abs.gov.au/statistics/people/population/births-australia/latest-release

Beaujouan, É. (2010). How is fertility affected by separation and repartnering?. Population Societies, 464(2), 1-4.

Beaujouan, E. (2023). Delayed Fertility as a Driver of Fertility Decline?. In *The Demography of Transforming Families* (pp. 41-63). Cham: Springer International Publishing.

Bergström, M., & Brée, S. (2023). Not a single meaning: Definition and evolution of singlehood in France and the United States. *Journal of Family Theory & Review*.

Bellani, D., Esping-Andersen, G., & Nedoluzhko, L. (2017). Never partnered: A multilevel analysis of lifelong singlehood. *Demographic Research*, *37*, 53-100.

Billari, F. C., & Liefbroer, A. C. (2010). Towards a new pattern of transition to adulthood?. *Advances in life course research*, *15*(2-3), 59-75.

Billingsley, S., & Oláh, L. (2022). Patterns of Co-Residential Relationships Across Cohorts in Post-Socialist Countries: Less Time for Childbearing?. Social Inclusion, 10(3), 87-99.

Bloome, D., & Ang, S. (2020). Marriage and union formation in the United States: Recent trends across racial groups and economic backgrounds. *Demography*, *57*(5), 1753-1786.

Boissonneault, M., & de Beer, J. (2022). Microsimulation of Household and Marital Transitions Leading to Childlessness Among Dutch Women Born Between 1971 and 2000. *Demography*, *59*(1), 137-160.

Bongaarts, J. (1978). A framework for analyzing the proximate determinants of fertility. Population and development review, 105-132.

Buchmann, M. C., & Kriesi, I. (2011). Transition to adulthood in Europe. *Annual review of sociology*, *37*, 481-503.

Chaloupková, J. K., & Hašková, H. (2020). The diversity of pathways to childlessness in the Czech Republic: The union histories of childless men and women. *Advances in Life Course Research*, *46*, 100363.

Chen, M., Yip, P. S., & Yap, M. T. (2018). Identifying the most Influential Groups in Determining Singapore's Fertility. *Journal of Social Policy*, *47*(1), 139-160.

Cortina, C., Castro- Martín, T. & Laplante, B. (2017). The changing demography of unmarried childbearing in Spain: Cohabiting vs. unpartnered mothers. Paper presented at the 2017 International Population Conference, Cape Town, South Africa.

Das Gupta, P (1993). Standardization and decomposition of rates: A user's manual. US Department of Commerce, Economics and Statistics Administration, Bureau of the Census.

de Vaus, D. A., & Gray, M. (2004). The Changing Living Arrangements of Children, 1946–2001. *Journal of Family Studies*, *10*(1), 9-19.

Dush, C. M. K., Jang, B., & Snyder, A. R. (2018). A cohort comparison of predictors of young adult union formation and dissolution in the US. *Advances in Life Course Research*, *38*, 37-49.

Eickmeyer, K. J. (2019). Cohort trends in union dissolution during young adulthood. *Journal of Marriage and Family*, *81*(3), 760-770.

Esteve, A., Boertien, D., Mogi, R., & Lozano, M. (2020). Moving out the parental home and partnership formation as social determinants of low fertility. Vienna Yearbook of Population Research, 18, 33-38.

Eurostat (2023). https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Marriage_and_divorce_statistics#:~:text=The%20proportion%20of%20live%20births,children%20were%20born%20inside%20marriage.

Fanelli, E. (2023). Italian Nonmarital Fertility Ratio: Components of an Unexpected Rise. *Population Research and Policy Review*, *42*(5), 79.

Fry, R. and K. Parker (2021). Rising Share of U.S. Adults Are Living Without a Spouse or Partner. Pew Research Center. https://www.pewresearch.org/social-trends/2021/10/05/rising-share-of-u-s-adults-are-living-without-a-spouse-or-partner/

Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*. Stanford university press.

Guzzo, K. (2021). Trends in births to single and cohabiting mothers under 40, 1980-2018. Family Profile No. 17.
https://www.bgsu.edu/ncfmr/resources/data/family-profiles/guzzo-trends-births-single-cohabiting-mothers-1980-2018-fp-21-17.html [Accessed 15 Feb 2023]

Hall, D. R. (2003). The pure relationship and below replacement fertility. *Canadian Studies in Population*, 51-69.

Heard, G. (2007). Boom or gloom?: cohort fertility data from the 2006 Census. *People and Place*, *15*(3), 1-11.

Heard, G., & Arunachalam, D. (2014). Fertility differentials. In *Family formation in 21st century Australia* (pp. 159-196). Dordrecht: Springer Netherlands.

Hellstrand, J., Nisén, J., & Myrskylä, M. (2022). Less partnering, less children, or both? Analysis of the drivers of first birth decline in Finland since 2010. *European Journal of Population*, *38*(2), 191-221.

Ivanova, K., Kalmijn, M., & Uunk, W. (2014). Fertility after repartnering in the Netherlands: Parenthood or commitment?. *Advances in Life Course Research*, *21*, 101-112.

Jalovaara, M., & Andersson, L. (2023). A register-based account of period trends in union prevalence, entries, and exits by educational level for men and women in Finland. *Demographic Research*, *48*, 373-386.

Jalovaara, M, and A.E Fasang. "From never partnered to serial cohabitors: Union trajectories to childlessness." *Demographic Research* 36 (2017): 1703-1720.

Jiang, Q., Yang, S., Li, S., & Feldman, M. W. (2019). The decline in China's fertility level: a decomposition analysis. *Journal of biosocial science*, *51*(6), 785-798.

Jones, G. (2018). What is driving marriage and cohabitation in low fertility countries?. *Low fertility regimes and demographic and societal change*, 149-166.

Keizer, R., Dykstra, P. A., & Jansen, M. D. (2008). Pathways into childlessness: Evidence of gendered life course dynamics. *Journal of biosocial science*, *40*(6), 863-878.

Laplante, B., & Fostik, A. L. (2015). Two period measures for comparing the fertility of marriage and cohabitation. Demographic Research, 32, 421-442.

Lazzari, E. (2022). Pathways into childbearing delay of men and women in Australia. *Longitudinal and Life Course Studies*, *13*(2), 307-334.

Nishikido, M., Cui, Q., & Esteve, A. (2022). Partnership dynamics and the fertility gap between Sweden and Spain. Genus, 78(1), 1-20.

Office of National Statistics (2023). Births by parents' characteristics https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsbyparentscharacteristics [Accessed 27 Feb 2023]

O'Leary, L., Natamba, E., Jefferies, J., & Wilson, B. (2010). Fertility and partnership status in the last two decades. Population Trends, 140, 5-35.

Pelikh, A., Mikolai, J., & Kulu, H. (2022). Make up or break up? Partnership transitions among young adults in England and Wales. *Advances in Life Course Research*, *52*, 100475.

Qu, L. & Baxter, J. (2023). Births in Australia. Facts and Figures 2023. https://aifs.gov.au/research/facts-and-figures/births-australia-2023#:~:text=In%201971%2C%20only%207%25%20of,of%20births%20occurred%20outside%20marriage.

Raab, M., & Struffolino, E. (2020). The heterogeneity of partnership trajectories to childlessness in Germany. *European Journal of Population*, *36*, 53-70.

Raymo, J. M., Park, H., Xie, Y., & Yeung, W. J. J. (2015). Marriage and family in East Asia: Continuity and change. *Annual review of sociology*, *41*, 471-492.

Saarela, J., & Skirbekk, V. (2020). Childlessness and union histories: Evidence from Finnish population register data. Journal of Biosocial Science, 52(1), 78-96.

Statistics Iceland (2017). Total fertility rate in Iceland never lower. https://statice.is/publications/news-archive/inhabitants/births-2016/#:~:text=Two%20thirds%20of%20the%20children,was%20born%20to%20married%20couples. [Accessed 27 Feb 2023]

Sironi, M., & Furstenberg, F. F. (2012). Trends in the economic independence of young adults in the United States: 1973–2007. *Population and Development Review*, *38*(4), 609-630.

Skirbekk, V. (2022). *Decline and Prosper!: Changing Global Birth Rates and the Advantages of Fewer Children*. Palgrave Macmillan.

Tocchioni, V. (2018). Exploring the childless universe: Profiles of women and men without children in Italy. *Demographic research*, *38*, 451-470.

van den Berg, L., & Verbakel, E. (2022). Trends in singlehood in young adulthood in Europe. *Advances in Life Course Research*, *51*, 100449.

Van de Kaa, D. J. (2002). The idea of a second demographic transition in industrialized countries. Paper presented at the Sixth Welfare Policy Seminar of the National Institute of Population and Social Security, Tokyo, Japan, 29 January 2002