# Fertility desires and expectations: stability and change over the lifecourse

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## Abstract

Little is known about the way attitudes towards childbearing change over the life course. Using data from an Australian panel study, the Household, Income and Labour Dynamics in Australia survey, we study stability and change in individual fertility desires and fertility expectations over seven years. We investigate: (1) how stable fertility desires and expectations are over time; and (2) whether life course events such as partnership formation and childbirth lead to a change in desires and/or expectations. Results show that individual's desires and expectations vary considerably over time, but that instability is strongly related to changes in circumstances. We find that: those who have low desire for children tend to not change their minds over time; having a second child lowers fertility desires; and that forming a cohabiting relationship or marriage is associated with an increase in both the desire and expectation of having a child.

## Introduction

Demographers are increasingly turning to survey data on individuals' fertility preferences and intentions to gain insights into the dynamics of fertility behaviour in low fertility countries. Information on preferences and intentions can improve our knowledge of how fertility decision making and individual agency operate at the micro level; elements which are easily lost when the focus is on the macro-level structural, demographic and social context in which fertility occurs (Schoen, *et al.* 1999; de Vaus 2002:21). Recent research in this area has largely focused on investigating the degree to which stated fertility preferences at one point in time are related to future fertility behavior (Schoen, *et al.* 1999; Noack and Øtsby 2000; Quesnel-Vallée and Morgan 2003; Berrington 2004; Testa and Toulemon 2006). A consistent finding of these longitudinal studies is that individuals tend to overestimate their future fertility but that intentions are nevertheless important predictors of fertility (Schoen, *et al.* 1999). Some of the factors which may prevent people from achieving their desired family size include: competing preferences between careers and childbearing, difficulties in finding a partner, relationship disruption, sterility, as well as the effects of postponing the age of childbearing (Bongaarts 2001). As the level of stated desired fertility tends to be higher than observed fertility there is scope for policy interventions to help individuals overcome some of the barriers to achieving their childbearing preferences (McDonald 2006).

An important limitation of many of these studies which compare intentions and behaviour, is that they implicitly assume that childbearing intentions remain relatively invariant over time (Beets, *et al.* 1999). Such a static perspective of fertility preferences is usually adopted for reasons of convenience, though in some cases it also reflects the view that preferences for children are determined relatively early in life by background factors, such as number of siblings or religiosity (Beets, *et al.* 1999; Englehardt 2004:4). A recent strand of research has began to focus on this issue, investigating how stable individuals' fertility intentions are, and what factors may lead them to change over time (Beets, *et al*. 1999; Heaton, *et al.* 1999; Qu, *et al.* 2000; Mitchell and Gray 2007; Heiland, *et al*. 2008; Liefbroer 2008). A greater understanding of the process by which intentions are adjusted in light of changing

circumstances adds to our understanding of the way individual fertility-decision making occurs and it complements the existing literature that examines when and why fertility preferences or intentions are predictive of actual childbearing (Heiland, *et al*. 2008).

The purpose of this paper is to extend this research on how fertility desires and expectations change over time. The focus is on investigating how life course factors and in particular childbearing and relationship formation or dissolution lead to revisions of childbearing aspirations and expectations.

## Background

It is important at the outset to note that the existing literature uses a number of different indicators to measure fertility attitudes including desired, ideal and intended family size, general childbearing desires, child-timing desires, and childbearing expectations (Miller and Pasta 1995). All these indicators measure some aspect of attitudes towards (further) childbearing but each one is a theoretically distinct concept. In this study we focus on two indicators, desires and expectations for future childbearing, which will be further defined in the next section. In discussing the literature and background however, we rely on studies which use a range of different measures, though the most commonly used one is that which refers to the number of children preferred, i.e total desired fertility or family size.

Due to the lack of longitudinal data on fertility intentions, very little is known about the way that attitudes towards childbearing may change over time. The handful of studies conducted so far provide strong preliminary evidence that desires and intentions are far from stable concepts and that they are modified and revised in light of changing life circumstances (Beets, *et al*. 1999; Heaton, *et al.* 1999; Heiland, *et al*. 2008; Liefbroer 2008, Mitchell and Gray 2007; Weston *et al.* 2004). For example, in a West German panel survey of over 3,500 respondents who were interviewed in 1988 and then six years later in 1994/95, 50 per cent of respondents had changed their level of total desired fertility between the two waves (Heiland*, et al.* 2008). Qualitative and quantitative evidence suggests that some of the important life course factors which may lead to adjustments in intentions or preferences of children over time include ageing, relationship transitions, childbearing experience, financial and employment changes and exposure to family or friends' children (Weston, *et al.* 2004).

### *Age*

Increasing age can have either a positive or negative effect on fertility aspirations. In a Dutch panel study spanning 18 years, family size intentions were found to be typically adjusted downwards with age (Liefbroer 2008). However the study also found considerably variability between people in the way that intentions were adjusted with age, with some individuals not adjusting them at all, or even adjusting them upwards. For older individuals, and in particular for women, increasing age may lead to an increase in fertility aspirations: they may feel a greater pressure to have children before it is 'too late'. As in other Western countries, this effect may be particularly strong in Australia where there is an increasing trend of postponement of fertility to later ages. For example between 1995 and 2005, the proportion of women who had their first birth at 35 years or over doubled from 5 to 10 per cent (ABS 2008a). However, it is also likely that at older ages, both men and women may revise their aspirations downwards or relinquish them completely if they are not likely to have the number of children that they previously desired (Heaton, *et al.* 1999). Such a downwards adjustment of desires may be a response to cognitive dissonance

(Festinger 1957), a 'psychologically uncomfortable' and 'anxiety arousing' state that occurs when individuals' actions or circumstances are inconsistent with their beliefs (Donovan and Henley 2003:100). For example if a positive wish to have a(nother) child is matched with a negative expectation that this is actually going to occur, perhaps due to the lack of a partner or financial or health difficulties, then individuals will feel a tension or dissonance which they may attempt to reduce by lowering their fertility desires to match their low expectations, and even rationalizing their current circumstances for example by focusing on the negative aspects of (further) childbearing.

For younger individuals, intentions may also increase or decrease as they grow older. An increase in childbearing intentions may occur as young people mature and increasingly consider the prospect of settling down. There is qualitative evidence that some young people feel more capable of handling the responsibility of children as they grow older and that they become less concerned with having fun or 'seeing the world' (Weston, *et al*. 2004). As Settersen and Hagestad (1997) note when it comes to childbearing and family formation there may be important cultural deadlines and norms regarding ideal ages to start and finish having children. While these age norms are likely to be relatively lose and flexible they may nevertheless provide individuals with important reference points, and fertility intentions may change as these age markers are approached. The effect of ageing on fertility intentions is of course also closely related to changes in other domains of life, such as employment and relationship formation.

***Relationship status***

A change in relationship status is another life course factor which may lead to revisions in childbearing desires and expectations over time. Cross-sectional evidence indicates that among childless individuals, single men and women are more likely to have lower fertility desires compared to either their cohabiting or married peers (Weston, *et al.* 2004). However from cross-sectional data it is difficult to know whether there is a selection process at work, whereby those who do not wish to have children are also more likely to be single, or if it represents a process by which individuals revise their intentions downwards during periods that they are single. Despite the importance of relationship formation to fertility behavior, how changes in relationship status affect the decisions people make regarding childbearing is an issue that has not been adequately investigated in Australia (Merlo and Rowland 2000; Qu, *et al*. 2000).

There is some qualitative evidence that the intentions of single people *do* change as they enter partnerships with the desire for a family increasing after meeting and falling in love with a partner (Weston, *et al.* 2004; Rotkirch 2007). The way that intentions are revised as people enter and exit relationships has also been highlighted in two Australian studies using longitudinal data. Comparing fertility intentions in 1997 and 2000 for a sample of initially childless respondents in the Australian 'Negotiating the Life Course' survey, Mitchell and Gray (2007) found that a substantial proportion of those who stated no preference for children subsequently changed their minds after becoming partnered and either had a child or stated that they now wanted at least one child. Only 21 per cent still maintained that they did not want a child. Similarly using two waves of data from the Australian Family Formation Project conducted in 1981 and 1990/91, Qu, *et al.* (2000) also find that changes in fertility intentions among initially childless individuals were often linked with changes in relationship status. In particular those who separated from their partner

between the two waves were the most likely to revise their intentions for children downwards, followed by those who were continuously single (Qu, *et al.* 2000).

Almost all research that examines the change in childbearing intentions as relationships change focuses on the formation or dissolution of *marriage* rather than *non-marital cohabitation*. We know little about if the type of relationship people enter is an important determinant, or if there is a difference between entering (or leaving) cohabitations and marriages. If cohabitation is less 'institutionalized' as compared with 'traditional' trajectories, the 'role hiatus' theory would suggest that individuals who cohabit might not experience the same normative pressure for family formation as those who marry and therefore may not express desires and intentions as strongly as those who are married (Beets, *et al.* 1999). While childbearing and marriage still have a very strong connection in Australia, 33 per cent of all births registered in 2007 were to parents who were not in a registered marriage (ABS 2008b). A large proportion of these births are to cohabiting parents. In fact cohabitation in Australia is a normative setting for having children with 92 per cent of Australians aged 18–34 stating that an unmarried couple with children was considered a family, while around 34 per cent of this age groups thought that people who want children ought to get married (Evans and Gray 2005). So we question whether there would be greater pressure on married couples as compared with cohabiting couples.

***Own childbearing experience***

A third important reason that childbearing desires and expectations may be expected to change is actual childbearing experience. A negative experience related to the birth of the first child, for example with the pregnancy, birth, or with childrearing, may have a dampening effect on future fertility intentions. Conversely, individuals may find childbearing to be an overwhelmingly positive experience and thus adjust their family size intentions upwards. There is very limited longitudinal empirical evidence regarding the direction of influence but there is a small amount of evidence that the latter effect is apparent. For example, in a West German longitudinal study, Heiland, *et al*. (2008) find that controlling for unobserved heterogeneity, the addition of a(nother) child increased the total number of children wanted by 0.14 children.

### *Financial and work related factors*

Financial and work related reasons are also likely to be a feature in revisions of childbearing intentions. An improvement in income may lead to an increased ability and confidence to either start childbearing or to have additional children, and therefore increase the intention for future childbearing. Conversely, the loss of a job or a lowering of income may lead to a lowering of intentions. In West Germany, Heiland, *et al.* (2008) finds that experiencing an unemployment spell has a negative effect on desired family size. On the other hand, the pursuit of a career can be seen as a competing factor between the ability to afford (further) children and presenting an opportunity cost, especially for women. Further, employment related factors may be particularly important at older ages when careers are more established. Liefbroer, *et al*. (2008) found that the number of hours worked did not have an effect on family size intentions when the respondents in their study were in their 20s, but when they reached their 30s and the number of hours worked increased the lower their family size intentions were.

### *Exposure to family and friends' children*

Being exposed to family and friends' children may also be a reason fertility intentions are revised. Recent research indicates that social networks, such as family and friends and other peer groups, may be an important source of influence on individuals' fertility intentions (White and Bernardi 2008; Keim, *et al*. 2009). Evidence on how these social networks may influence decision making comes mainly from qualitative studies. In Rotkirch's (2007) qualitative study of childbearing desires among Finnish women she finds that being exposed to peers, family and friends who have had a child may trigger 'baby fever' or a sudden longing for a child amongst some women. In their qualitative study of a sample of German men and women, Keim, *et al*. (2009) also found that siblings and cousins with children often served as important role models and points of reference for respondents. With these family members, individuals could 'talk about family formation, interact with their children, and, as a consequence, often feel both rationally and emotionally motivated to have a child of their own' (Keim, *et al.* 2009:10). Similarly friends can also provided opportunities to observe the positive and negative effects of childbearing while other members of a person's social network such as colleagues may be a source of specific information, for example regarding work and family reconciliation (Keim, *et al.* 2009). While social networks and peer influence are likely to be important factors in explaining changes in childbearing desires over time, it is unfortunately difficult to include consideration of these factors in quantitative analyses due to the lack of appropriate data.

## Objective

The objective of this study is to examine the development of individual fertility desires and expectations over time in Australia. Of particular interest is: (1) the stability of desires and expectations; and (2) how life course events such as partnership formation and childbirth lead to a change in desires and/or expectations. We expand on previous work in this area by analyzing two different dimensions of future fertility, desires and expectations, rather than the singular dimension of 'total desired fertility' (Heiland, *et al.* 2007; Liefbroer 2008) and we also include people who already have children, in addition to those who are childless. Based on previous research findings, our main research questions are:

- How stable are individuals' desires and expectations over time? Do expectations for future childbearing show greater variability over time compared to desires?
- Do individuals who are not in a relationship have lower fertility aspirations than those who are in a partnership? Are childbearing desires and expectations revised as people enter or exit relationships?
- How does own childbearing experience, and in particular the birth of the first child, affect childbearing desires?
- How does ageing affect the development of fertility desires and expectations over time?

## Data and method

### *Data*

The data for this study come from the Household, Income and Labour Dynamics in Australia (HILDA) survey. HILDA is a nationally representative panel study which surveyed over 13,000 individuals aged 15 and over in the first wave (2001). HILDA collects information on three key dimensions of future fertility desire, expectation and family size. From each wave the following information is available:

- The desire for children is measured by a question which asks respondents to rate on a scale of 0 to 10 their feelings about having a/another child in the future: *"Would you **like** to have [a child of your own/ more children] in the future?"*
- The expectation of having children is measured by the following question which asks respondents to rate on a scale of 0 to 10 how likely they think they are to have a/ another child: *"And how **likely** are you to have [a child/ more children] in the future?"*
- Preferred family size is measured by a third question which asks respondents to state how many more children they intend to have. This question is only asked of respondents who stated an expectation for future children of 6 or above, in the previous question.

This study is restricted to the first two questions. Of interest here is not the total family size or number of children that individuals would like, but rather how strong their preferences for a(nother) child are, how their desires and expectations change, and what triggers these changes. Childbearing desires reflect the degree to which individuals wish to have a(nother) child. Desires themselves are formed through background traits such as childbearing motivations which have both biological and experiential origins (Miller and Pasta 1995:533). Childbearing expectations on the other hand can be thought of as individuals' beliefs or assessments regarding their future and therefore they are likely to include a consideration of one's desires in combination with explicit consideration of one's current and anticipated future circumstances. Both desires and expectations can therefore be expected to change with changing circumstances.

With regards to how these questions were answered by respondents it is important to note the possibility that individuals gave socially desirable answers. As Rovi (1994) notes even in contemporary societies there is often a stigma involved with being childless and so it is 'socially difficult' for individuals to express a low desire for having children if they are currently childless. The same may be true for individuals with one child, who may be motivated to express a high desire for another child regardless of their own personal preference, to fit in with the social norm which sees two children as being the ideal family size and which may attribute various negative aspects to raising an only child.

To examine the evolution of fertility desires and expectations over time we use an unbalanced sample of individuals aged between 18-45, who were interviewed for at least two waves of the first seven waves of HILDA, conducted between 2001 and 2007. After excluding respondents with missing values, the final analytical sample totals 8,462 respondents. We analyze this sample as a whole, but in looking at the determinants of changing desires over time we also focus separately at a subsample of individuals who have no children, and who do not experience any parity transition over the period of observation. This subgroup is analysed separately because in some cases the close proximity of relationship and parity transitions in time, mean that it may be difficult to separate out the effect of these two variables on childbearing

desires over time. An example would be the case of a couple who in one year married and had their first child.

Basic descriptive statistics about the total sample, as well as the mean values of fertility desires end expectations are shown in Table 1. For the time-varying variables shown in Table 1, e.g marital status and the mean desires and expectations the values represent the situation at time 1.

**Table 1. Sample descriptives, at time 1.**

| Variable | Mean values (weighted) | | Freq. | % |
|---|---|---|---|---|
| | Desire | Expectation | | |
| **Sex**** | | | | |
| Male | 5.6 | 5.1 | 4,068 | 50.4 |
| Female | 5.3 | 4.8 | 4,394 | 49.6 |
| **Age group**** | | | | |
| 18-24 | 7.6 | 7.5 | 2,557 | 31.9 |
| 25-29 | 7.1 | 6.7 | 1393 | 17.6 |
| 30-34 | 5.5 | 4.9 | 1,516 | 17.7 |
| 35-39 | 3.1 | 2.3 | 1,525 | 16.4 |
| 40+ | 1.6 | 0.9 | 1,471 | 16.3 |
| **Relationship status**** | | | | |
| Married | 3.9 | 3.4 | 3,359 | 37.2 |
| Cohabiting | 6.3 | 6.0 | 1,653 | 15.6 |
| Single- previously married | 2.5 | 1.7 | 466 | 5.5 |
| Single -never married | 6.9 | 6.4 | 2,981 | 41.7 |
| **Parity**** | | | | |
| 0 | 7.2 | 6.8 | 4,462 | 57.5 |
| 1 | 6.0 | 5.4 | 1,091 | 12.5 |
| 2 | 2.0 | 1.5 | 1,600 | 17.2 |
| 3+ | 1.4 | 1.0 | 1,309 | 12.7 |
| Total | 5.4 | 5.0 | 8,462 | 100.0 |

note: p<0.05 ( ** )

*Source: HILDA waves 1-7*

***Method***

We start by establishing the overall determinants of childbearing desires and childbearing expectations, using data from the first wave respondents were observed in. This cross-sectional analysis indicates how factors such as age, relationship status and parity lead to differences in desires and expectations for future fertility *between* respondents at one point in time. We then examine how desires and expectations change over time. We investigate the overall degree to which these two measures vary over time, and then identify how these indicators are revised upwards or downwards in light of changing circumstances, paying particular attention to the role of transitions in partnership status and parity.

*Desires and expectations for children at time 1 (cross-sectional)*

The analytical strategy employed for the first part of the study examining desires and expectations at time 1 is multivariate ordinal regression. Ordinal regression is applied on a three-category variable created by splitting the scores of the desire/expectations questions into groups representing low (0–3), medium (4–6) and high scores (7–10). Two separate models are run, one for desires and one for expectations. Independent variables include respondent age, relationship status, parity (number of children ever born), highest education, employment, importance of religion, and number of siblings at time 1. The models are also run separately for men to investigate whether the effect of the independent variables is different for men and women, and also to control for the possibility of sex differences in the way that questions are answered. The ordinal regression model predicts the probability of being in the low score category versus being in a higher scoring category, and then the probability of being in the low or medium scoring category versus the probability of being in the high score category.

*Change in desires and expectations for childbearing over time*

*Change score models*

For the second part of the study, we use two different approaches to model changes in desires and expectations over time. The first approach is a conditional change score analysis which uses only information from the first and the last wave that individuals were observed. The dependent variable is the desire or expectation at the last wave and this is regressed on the desire/expectation at the first wave, as well as variables describing relationship and parity transitions that occurred between the first and last wave. The reference group for the relationship transitions variables is those who were continuously single, and this group is compared with those who were continuously cohabiting, continuously married, those who went from being single to cohabiting/married, those who went from cohabiting/married to single and those with other relationship transitions. For the parity transition variable the reference group is those who remained childless between the first and last wave, and they are compared with those who experienced the birth of their first or second child, who had two or more children and no additional children, and those who had two or more children and also had additional children born during the period. Controls for age and education at time 1 are also included. Since the respondents in the sample were observed for different periods of time, and since it is likely that the chance of variation in the dependent variable would increase with the length of time of observation, the number of years between the first and last observation of each respondent was also controlled for. We estimate the models separately for men and women, also for those who had no children and throughout the period of observation, as well as for the total sample[1].

In terms of the modeling approach, by including the desire/expectation at time 1 on the right hand side of the equation 1 this helps to avoid regression to the mean (Finkel 1995). In this case regression to the mean may occur as respondent with high intentions at time 1 are more likely to give a lower score at the later time and vice versa.

[1] Ideally we would also have estimated separate models by parity, however splitting the groups by both sex and parity would have ended in very small numbers for some of the change variables.

$$Y_t = \beta_0 + \beta_1 X_t + \beta_2 Y_{t-1} + \varepsilon_t \quad (1)$$

This model can be interpreted as the effect of the *X* variables (which may refer to characteristics at time 1 or which may describe transitions between time 1 and time 2) in the change in *Y* over the two time periods. This is because by subtracting $Y_{t-1}$ from equation 1 the model is directly equivalent to equation 2 (Finkel 1995):

$$\Delta Y \text{ or } Y_t - Y_{t-1} = \beta_0 + \beta_1 X_t + (\beta_2 - 1)\ Y_{t-1} + \varepsilon_t \quad (2)$$

As Berrington, *et al*.(2007:10) note however, an important limitation of the conditional change score model is that it only uses information from two time points, leading to a loss of information in situations such as this where the panel data contains more than two time periods that could potentially be analyzed. The second approach uses fixed effects methods that take into account all the time points.

*Fixed effects*

Fixed effects models focus exclusively on variation within people over time, discarding information on variation between people (Allison 2005). This loss of information regarding between-person variation leads to higher standard errors and less efficiency. However, an advantage of fixed effects methods is that they provide unbiased estimates in cases where there is unobserved heterogeneity, where time-invariant unobserved characteristics that vary between individuals are correlated with the predictors. Heiland, *et al*. (2008:138) note an example would be that some individuals attach a particularly high value on family life (unobserved personality characteristic) and these individuals may also be more likely to get married than the average person. Not controlling for this unobserved heterogeneity would then bias the estimates for the relationship between fertility desires and being married. Hausman tests also confirmed the appropriateness of using a fixed effects approach rather than a random effects specification for the desire and expectation models.

Fixed effects methods can be estimated by taking deviations at each observation from the individual's means. For all the independent as well as the dependent variables, the mean value averaged across all the points of observation for each particular individual are taken and at each time point the deviations are subtracted from this mean.

$$Y_{it} = \beta_i X_{it} + a_i + u_i \quad \text{where } a_i \text{ is the constant or fixed effect of being in state } i. \quad (3)$$

While this controls for unobserved characteristics $a_i$ which are constant over time, it unfortunately also removes observed characteristics such as sex which are also constant over time. While no estimates can be produced for all stable variables, such as sex, they are nevertheless controlled for in the model. Both the change score model and the fixed effects model use information on individual's relationship and parity transitions over time, so to give an indication of the numbers undertaking these transitions sample descriptives relating to these variables are shown in Table 2.

**Table 2. Sample descriptives of parity and relationship changes, time 1 - time *N***

| | N | % |
|---|---|---|
| **Parity Transitions** | | |
| *0 children at time 1* | 4,462 | 100.0 |
| 0 additional children | 3,524 | 79.0 |
| 1 child | 562 | 12.6 |
| 2+ children | 376 | 8.4 |
| 1 child at time 1 | 1,091 | 100.0 |
| 0 additional children | 636 | 58.3 |
| 1+ children | 455 | 41.7 |
| 2+ children at time 1 | 2,909 | 100.0 |
| 0 additional children | 2,557 | 87.9 |
| 1+ children | 352 | 12.1 |
| **Relationship transitions** | | |
| Continuously married | 3,015 | 39.9 |
| Continuously cohabiting | 821 | 10.9 |
| Continuously single | 2,333 | 30.9 |
| Single to cohabiting or married | 903 | 12.0 |
| Cohabiting to married | 486 | 6.4 |
| Cohabiting or married to single | 515 | 6.8 |
| Other | 389 | 5.2 |

## Results

***Ordinal regression of desires and expectations at time 1***

Table 3 presents the results of the ordinal regression of fertility desires at the first time individuals were observed. For both men and women, desires are negatively related to age. Compared to the reference category aged 25-29, those aged 30 and over have significantly lower odds of having a high desire for children, and those aged under 25 have significantly higher odds. Relationship status is also an important predictor of fertility desires. Those who are cohabiting or married have significantly higher odds of having a high desire for children compared to those who are single.The cross-sectional results also indicate the existence of a two-child norm. For both men and women the desire and expectation for future childbearing is negatively related to parity. Compared to those with no children those with just one child have lower odds of having a high desire score, but the effect is particularly striking for those with two children. These results are in line with evidence that suggests a two-child family is the preferred family size of most Australians (Weston, *et al*. 2004).

In terms of education, the results indicate that those who had a university degree had higher odds of being in a higher score category. A similar effect was found in the study by Weston, *et al.* (2004) where among childless respondents, men in their twenties and women in their thirties with university degree education were slightly more likely to 'definitely' want a child in the future, compared to those with lower education. Employment did not appear to be a significant predictor of desires or expectations for women, but for men being either full-time or part-time employed increased the odds of being in a higher answer category, compared to men who were not employed. As Heard (2008:35) notes, men with better economic prospects are generally thought of as being more attractive partners so the difference in desire and expectations regarding future childbearing amongst men who are not employed could be related to their low confidence or expectation of forming a new relationship, or sustaining an existing one.

It is interesting to note that the influence of number of siblings on fertility desires is significant for women but not for men: women with one or more siblings have higher intentions compared to women who no siblings. While this result resembles the findings by Zimmer and Fulton (1980) and Réigner-Loilier (2006) who also found that the size of the family of origin has a slightly greater effect on women's rather than men's fertility it differs from recent evidence using population register data in Denmark, where the effect of number of siblings had an identical positive effect on men's and women's fertility (Murphy and Knudsen 2002). Various reasons have been proposed to explain intergenerational transmissions of family size including the role of genetics, early socialization and the desire to replicate family settings experienced during childhood, as well as environmental influences regarding the economic differences and differential investment in children between families of different sizes (Murphy and Knudsen 2002; Réigner-Loilier 2006). It is also possible that the greater the number of siblings, the greater the chance of being exposed to the sibling's children when those siblings begin childbearing, and perhaps this has a greater influence on women than on men. Overall the results for desires and expectations were very similar.

While the results presented above provide some indication of variables such as relationship status that differ between people are related to different fertility desires and expectations they do not tell us if changes in these determinants have a similar

effect in changing individuals' desires and expectations. For example while those who are single may have lower intentions at one point in time, do their intentions change when they enter a relationship? This is the focus of the following section, which begins with an examination of the overall variation in desires and expectations over time.

**Table 3. Ordinal regression: (1) fertility desires; (2) fertility expectations at time 1, by sex**

| | (1) Fertility desires | | | | (2) Fertility expectations | | | |
|---|---|---|---|---|---|---|---|---|
| | Males | | Females | | Males | | Females | |
| **Variable** | **Odds ratio** | **S.E** | **Odds ratio** | **S.E** | **Odds ratio** | **S.E** | **Odds ratio** | **S.E** |
| **Age** | | | | | | | | |
| *(ref: 25-29)* | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 18-24 | 1.26* | 0.15 | 1.51** | 0.18 | 0.58** | 0.07 | 0.49** | 0.06 |
| 30-34 | 0.62** | 0.08 | 0.55** | 0.06 | 0.29** | 0.04 | 0.22** | 0.03 |
| 35-39 | 0.33** | 0.04 | 0.23** | 0.03 | 0.12** | 0.02 | 0.06** | 0.01 |
| 40+ | 0.16** | 0.02 | 0.07** | 0.01 | 0.05** | 0.01 | 0.01** | 0.00 |
| **Relatioship status** | | | | | | | | |
| *(ref: Single)* | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Cohabiting | 1.71** | 0.19 | 1.87** | 0.20 | 2.57** | 0.29 | 2.37** | 0.26 |
| Married | 1.46** | 0.16 | 1.57** | 0.16 | 2.33** | 0.27 | 2.27** | 0.25 |
| **Parity** | | | | | | | | |
| *(ref: 0 children )* | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 1 child | 0.70** | 0.08 | 0.68** | 0.08 | 0.7** | 0.08 | 0.64** | 0.08 |
| 2 children | 0.13** | 0.02 | 0.12** | 0.01 | 0.10** | 0.01 | 0.10** | 0.01 |
| 3 + children | 0.10** | 0.02 | 0.10** | 0.01 | 0.10** | 0.02 | 0.07** | 0.01 |
| **Education** | | | | | | | | |
| *(ref: less than university)* | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| University level | 1.27** | 0.12 | 1.48** | 0.14 | 1.56** | 0.16 | 1.60** | 0.16 |
| **Employment** | | | | | | | | |
| *(ref: not employed)* | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Emp. Full-time | 1.50** | 0.16 | 1.03 | 0.10 | 1.30** | 0.14 | 0.94 | 0.10 |
| Emp. Part-time | 1.52** | 0.20 | 0.90 | 0.08 | 1.35** | 0.18 | 0.81** | 0.08 |
| **Importance of religion** | | | | | | | | |
| *(ref: Limited or no importance)* | | | | | | | | |
| Important/ very important | 1.74** | 0.15 | 1.38** | 0.11 | 1.65** | 0.14 | 1.46** | 0.12 |
| **Number of siblings** | | | | | | | | |
| (ref: no siblings) | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 1 sibling | 1.04 | 0.13 | 1.45** | 0.20 | 0.95 | 0.12 | 1.44** | 0.20 |
| 2 + siblings | 1.10 | 0.13 | 1.38** | 0.17 | 1.02 | 0.12 | 1.24* | 0.16 |
| Number of observations | 3,852 | | 4,250 | | 3,852 | | 4,250 | |
| Log likelihood | -3,018.3 | | -2928.6 | | -2,859.9 | | -2667.1 | |
| LR chi2(15) | 1617.6 (p <0.001) | | 2360.8 (p<0.001) | | 2041.7 (p <0.001) | | 2947.7 (p<0.001) | |

note: p<0.05 ( ** ), p<0.10 ( * )
source: HILDA Waves 1-7

***Variation in desires and expectations over time***

The degree to which respondents' answers to fertility desires and expectations questions varied over the time they were observed was highly dependent on whether or not their overall desires were high or low. Those with the lowest or highest desires showed the greatest stability in their responses over time. For example, conditional on a respondent ever having given a score of 0 to 3 on regarding their desire or expectation to have a child in the future, over 70 per cent of the time they gave a response in the same low category. For the highest responses there was also a high degree of stability in the pattern of answers, as respondents who ever gave a response of seven or above did so nearly 70 percent of the time they were observed. Not surprisingly those who ever gave an answer in the medium category had more unstable answering patterns.

Overall 54 percent of individuals gave responses in the same category in every wave they were observed, 33 per cent gave responses in two different categories, and 13 per cent responded with all three categories at some point, i.e they gave low, medium and high scores.

Table 4, gives a bit more detail on how the average difference between desires as recorded at the first and last point of observation were related to three factors; relationship transitions, ageing and parity transitions. For the relationship transitions and the ageing, the factors relate to the subsample who were childless to avoid any confounding effects of parity transitions. For the relationship transitions, those who were continuously married or cohabiting on average experienced a small increase in desires. In contrast those who were continuously single, and those who experienced a relationship breakdown experienced a decrease in desires. The highest increase in desires was observed among those who formed a new relationship (cohabitation or marriage), those who went from a cohabitation into a marriage, and those in the other category.

In terms of the effect of ageing those who were initially aged between 18-24 or 25-29 both experienced a small increase in desires over time, on average. In contrast those aged 30 or over were more likely to experience a decrease and the effect was particularly strong at ages 35 and over. The effect of parity transitions, for the total sample, indicates a strong decrease in desires for further childbearing after the birth of a second child, among those who initially had no children or one child.

**Table 4. Mean difference in desires for children at time 1- time N, by relationship transition, initial age group and parity transition**

| | Mean difference | N |
|---|---|---|
| **Relationship transition** | | |
| Continuously married | 0.16 | 422 |
| Continuously cohabiting | 0.29 | 453 |
| Continuously single | -0.14 | 1,751 |
| Single to Cohab/Marriage | 0.75 | 678 |
| Cohabiting to Married | 0.39 | 277 |
| Cohab/Married to Single | -0.54 | 147 |
| Other | 0.63 | 176 |
| | | 3,904 |
| **Age** | | |
| 18-24 | 0.22 | 2,266 |
| 25-29 | 0.20 | 849 |
| 30-34 | -0.03 | 536 |
| 35-39 | -0.23 | 253 |
| **Parity transitions** | | |
| no child, +0 | -0.11 | 3,524 |
| no child, +1 | -0.89 | 562 |
| no child, + 2 or more | -5.13 | 376 |
| 1 child, +0 | -1.26 | 636 |
| 1 child, +2 or more | -5.09 | 455 |
| 2+ children , +0 | -0.35 | 2,557 |
| 2+ children, +more | -3.20 | 352 |

*Change score analysis of change in desires and expectations*

The following section is aimed at investigating the determinants behind the variability in responses over time. The first technique used is a conditional change score analysis model, using only information from the two time points, the first and last observation wave. The results for desires and expectations are presented in Table 5a for the childless sample, and Table 5b for the total sample.

Starting with the childless sample, compared to the reference category of 18–24 year olds, individuals in the older age groups were more likely to experience a decline in desires over time. In terms of the other main variable of interest, relationship transitions, compared to the reference category of those who were continuously single, those who were continuously cohabiting or continuously married were more likely to experience an increase in desires over time, confirming the bivariate results outlined above. The effect was slightly larger for marriage rather than cohabitation. Those who went from being single to cohabiting or married, as well as those who transitioned to a marriage after a cohabitation also were significantly more likely to have an increase in both desires and expectations for childbearing, compared to those who were continuously single. The effect of relationship breakdown was not statistically significantly different from the reference category. In Table 5b, which presents the results for the total sample, the results of the relationship transition are similar but not as strong as in the childless sample.

In terms of parity transitions, the other main independent variable of interest, those who transitioned from zero to one child between the two periods were not significantly more likely to experience either an increase or decrease in childbearing desires over time compared to those who had zero children throughout. However, moving from having either no children or one child to two children significantly lowers the desire for children, again confirming the existence of a two-child norm.

For the analysis of change in expectations over time, overall the results were very similar to what they were for desires.

**Table 5a. Childless sample. Change score analysis of: (1) childbearing desires; (2) childbearing expectations**

| | (1) Childbearing desires | | | | (2) Childbearing expectations | | | |
|---|---|---|---|---|---|---|---|---|
| | Males | | Females | | Males | | Females | |
| **Variable** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** |
| **Fertility desire/expectations at time 1** | 0.52** | 0.02 | 0.55** | 0.03 | 0.53** | 0.02 | 0.47** | 0.03 |
| **Age at time 1** | | | | | | | | |
| *(ref: 25-29)* | | | | | | | | |
| 18-24 | 0.44** | 0.15 | 0.26* | 0.14 | 0.47** | 0.15 | 0.45** | 0.15 |
| 30-34 | -0.50** | 0.19 | -0.63** | 0.21 | -0.35* | 0.19 | -0.81** | 0.23 |
| 35-39 | -1.32** | 0.27 | -1.59** | 0.32 | -1.31** | 0.27 | -2.38** | 0.33 |
| **Relationship transitions, time 1- time N** | | | | | | | | |
| *(ref: Continuously single)* | | | | | | | | |
| Continuously cohabiting | 0.82** | 0.17 | 0.52** | 0.18 | 0.76** | 0.18 | 0.74** | 0.18 |
| Continuously married | 1.02** | 0.19 | 0.90** | 0.18 | 0.87** | 0.21 | 0.85** | 0.19 |
| Single to cohabiting and/or married | 1.25** | 0.16 | 1.28** | 0.17 | 1.70** | 0.16 | 1.78** | 0.17 |
| Cohabiting to married | 1.45** | 0.20 | 1.14** | 0.20 | 1.28** | 0.22 | 1.29** | 0.21 |
| Cohabiting/married to single | -0.22 | 0.32 | 0.37 | 0.42 | -0.18 | 0.31 | 0.10 | 0.44 |
| Other | 0.94** | 0.33 | 1.49** | 0.26 | 1.02** | 0.33 | 1.37** | 0.27 |
| **Education** | | | | | | | | |
| *(ref: less than university)* | | | | | | | | |
| University level | 0.32* | 0.17 | 0.17 | 0.15 | 0.35** | 0.16 | 0.30* | 0.16 |
| **Number of years observed** | -0.12** | 0.03 | -0.19** | 0.03 | -0.17** | 0.03 | -0.30** | 0.04 |
| **Constant** | 3.36** | 0.26 | 3.72** | 0.27 | 3.20** | 0.24 | 4.18** | 0.28 |
| Number of observations | 2,066 | | 1,826 | | 2,066 | | 1,826 | |
| F statistic | .2 (p<0.01) | | 85.23(p<0.01) | | 119.2 (p<0.01) | | 101.5 (p<0.01) | |

note: p<0.05 ( ** ), p<0.10 ( * )

**Table 5b. Total sample. Change score analysis of: (1) childbearing desires; (2) childbearing expectations**

| | (1) Childbearing desires | | | | (2) Childbearing expectations | | | |
|---|---|---|---|---|---|---|---|---|
| | Males | | Females | | Males | | Females | |
| **Variable** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** |
| **Fertility desire/expectations at time 1** | 0.45** | 0.02 | 0.42** | 0.02 | 0.44** | 0.02 | 0.37** | 0.02 |
| **Age at time 1** | | | | | | | | |
| *(ref: 18-24)* | | | | | | | | |
| 18-24 | 0.44** | 0.15 | 0.81** | 0.15 | 0.55** | 0.15 | 1.07** | 0.15 |
| 30-34 | -0.87** | 0.18 | -1.05** | 0.16 | -0.84** | 0.17 | -1.06** | 0.15 |
| 35-39 | -1.46** | 0.18 | -1.73** | 0.17 | -1.49** | 0.17 | -1.74** | 0.15 |
| 40+ | -1.82** | 0.19 | -2.17** | 0.18 | -1.87** | 0.17 | -2.35** | 0.16 |
| **Relationship transitions, time 1- time N** | | | | | | | | |
| *(ref: Continuously single)* | | | | | | | | |
| Continuously cohabiting | 0.23 | 0.16 | 0.43** | 0.16 | 0.13 | 0.15 | 0.40** | 0.14 |
| Continuously married | -0.09 | 0.14 | 0.23* | 0.12 | -0.09 | 0.13 | 0.27** | 0.10 |
| Single to cohabiting and/or married | 0.98** | 0.17 | 0.95** | 0.16 | 1.39** | 0.16 | 1.29** | 0.15 |
| Cohabiting to married | 0.83** | 0.22 | 0.79** | 0.22 | 0.63** | 0.22 | 0.71** | 0.20 |
| Cohabiting/married to single | 0.05 | 0.21 | -0.25 | 0.21 | -0.03 | 0.20 | -0.29 | 0.18 |
| Other | 0.60** | 0.26 | 0.81** | 0.21 | 0.67** | 0.24 | 0.71** | 0.20 |
| **Education** | | | | | | | | |
| *(ref: less than university)* | | | | | | | | |
| University level | 0.23* | 0.12 | 0.16 | 0.11 | 0.22** | 0.11 | 0.10 | 0.09 |
| **Number of years observed** | -0.15** | 0.02 | -0.17** | 0.03 | -0.17** | 0.02 | -0.23** | 0.02 |
| **Parity transitions, time 1- time N** | | | | | | | | |
| *(ref: no child - no child)* | | | | | | | | |
| no child - 1 child | -0.02 | 0.20 | 0.07 | 0.20 | -0.27 | 0.22 | 0.18 | 0.20 |
| no child - 2+children | -3.27** | 0.32 | -3.59** | 0.28 | -3.39** | 0.30 | -3.67** | 0.25 |
| 1 child - 1 child | -1.25** | 0.20 | -1.45** | 0.20 | -1.22** | 0.19 | -1.54** | 0.18 |
| 1 child - 2+children | -3.28** | 0.27 | -3.87** | 0.24 | -3.69** | 0.25 | -3.64** | 0.24 |
| 2+ children - no additional | -1.50** | 0.17 | -1.85** | 0.16 | -1.39** | 0.15 | -1.74** | 0.14 |
| 2+ children + additional childr | -2.56** | 0.29 | -3.02** | 0.27 | -2.58** | 0.27 | -3.31** | 0.23 |
| **Constant** | 3.99** | 0.21 | 4.15** | 0.22 | 3.77** | 0.20 | 4.17** | 0.20 |
| Number of observations | 4,068 | | 4,394 | | 4,068 | | 4,394 | |
| F statistic | 477.1 (p<0.01) | | 705.0(p<0.01) | | 568.6 (p<0.01) | | 737.3 (p<0.01) | |

note: p<0.05 ( ** ), p<0.10 ( * )

*Fixed effects analysis*

Table 5 presents the results of the fixed effects analysis of desires and expectations. Since fixed effects models are based on within-individuals variation in the dependent and independent variables some of the predictors were re-coded to provide more opportunity for individuals to experience a change in these variables over the relatively short time period they were observed. Age was grouped into a dummy variable indicating whether the respondent was 35 years of age or over at time 1. Relationship status was reflected by a time-varying dummy variable indicating whether the respondent was single, cohabiting or married at that point in time. In term of parity transitions we measure if the respondents had zero, one or two additional children. For individuals who already had two children, we count any additional children in one category. Two interaction effects were also included. An interaction between time and age was added to observe whether the effect of ageing (or time passing) on desires and expectations was different for younger or older individuals. An interaction between time and sex was included to see if the effect of ageing was different for men and women. Interactions with employment and sex and age and sex were also tested but were not significant.

The results indicate that childbearing desires decline more rapidly for individuals who were initially aged 35 and over than for those under 35, and this effect was evident at all parities. This may point to a process where those over 35 feel a growing realization that they may not be able to achieve their childbearing desires and therefore revise their intentions downwards. For the relationship between time and sex, there were some small but significant effects, indicating that women were more likely to experience a decline in desires and expectations over time. In terms of relationship status, the main variable of interest, this was consistently associated with higher desires and expectations for childbearing at all parities. Individuals had lower desires and lower expectations during periods when they were not cohabiting or married. This confirms the earlier findings from the change score model, and from previous research (Qu, *et al.* 2000; Mitchell and Gray 20007) which finds that relationship formation can reverse previously held intentions upwards, while relationship dissolution can have the opposite effect.

As expected the effect of having one or two additional children also has a dampening effect on future fertility desires and expectations. The effect is smallest however for initially childless people when they go on to have their first birth. We suggest in contrast to the change score model, since this model includes all time points that individuals were observed, the coefficient for the first child birth may be lower due to the inclusion of the low scores around the first year that the child was born. It is likely that while many of those who have had one child will have a strong desire for another child, desire may be relatively low during the immediate birth of the first child and only become stronger after the first child has moved beyond its first or second year.

Employment does not appear to have any consistent effect on changes in desires or expectations over time. It is related to an increase in desire for initially childless individuals, put not for individuals at parities 1 and 2 where being employed is associated with a decrease in expectations of future childbearing. This may be due to difficulties in combining work and family, which has a negative effect on future fertility aspirations. It is also possible that there was not enough variation in employment status over time to be able to produce valid estimates.

**Table 6. Fixed effects analysis of: (1) desires and (2) expectations, by parity**

| | (1) Childbearing desires | | | | | | (2) Childbearing expectations | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Parity 0** | | **Parity 1** | | **Parity 2** | | **Parity 0** | | **Parity 1** | | **Parity 2** | |
| **Variable** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** | **coef** | **sd** |
| **Time** | -0.04** | 0.01 | -0.13** | 0.04 | 0.00 | 0.03 | -0.07** | 0.01 | -0.14** | 0.04 | -0.02 | 0.02 |
| **Time *Age** *(reference: under 35)* | -0.22** | 0.02 | -0.14** | 0.05 | -0.10** | 0.03 | -0.13** | 0.02 | -0.06 | 0.04 | -0.03 | 0.02 |
| **Time* Sex** *(reference: Male)* | -0.03* | 0.02 | -0.07* | 0.04 | -0.05* | 0.03 | -0.05** | 0.02 | -0.07* | 0.04 | -0.04* | 0.02 |
| **Relationship status** | | | | | | | | | | | | |
| *(ref: Single)* | | | | | | | | | | | | |
| Cohabiting | 0.48** | 0.06 | 0.90** | 0.19 | 0.74** | 0.17 | 0.87** | 0.06 | 1.09** | 0.17 | 0.70** | 0.13 |
| Married | 0.78** | 0.08 | 0.94** | 0.20 | 0.29* | 0.16 | 1.11** | 0.08 | 1.11** | 0.19 | 0.12 | 0.13 |
| **Parity** | | | | | | | | | | | | |
| *(ref: initial parity e.g 0,1,2)* | | | | | | | | | | | | |
| Parity +1 | -0.57** | 0.07 | -3.82** | 0.14 | -3.35** | 0.14 | -0.64** | 0.07 | -4.16** | 0.13 | -3.64** | 0.11 |
| Parity +2 | -4.61** | 0.10 | -6.43** | 0.26 | | | -5.17** | 0.10 | -7.21** | 0.25 | | |
| **Employment** | | | | | | | | | | | | |
| *(ref: not employed)* | | | | | | | | | | | | |
| Employed | 0.13** | 0.05 | -0.24* | 0.14 | -0.04 | 0.11 | 0.09 | 0.05 | -0.46** | 0.13 | -0.22** | 0.09 |
| **Constant** | 7.06** | 0.06 | 5.80** | 0.18 | 2.14** | 0.16 | 6.49** | 0.06 | 5.15** | 0.17 | 1.77** | 0.13 |
| Person-years | 21,292 | | 5,486 | | 7,643 | | 21,292 | | 5,486 | | 7,643 | |
| Number of individuals | 4,462 | | 1,091 | | 1,600 | | 4,462 | | 1,091 | | 1,600 | |
| F statistic | 361.32 ( p<( | | 254.3, (p<0.01) | | 121.05, (p<0 | | 476.2, (p<0.01 | | 346.61, (p<0.01 | | 213.9, (p<0.01 | |
| Within individual $R^2$ | 0.14 | | 0.32 | | 0.12 | | 0.18 | | 0.38 | | 0.20 | |
| Rho | 0.68 | | 0.65 | | 0.63 | | 0.70 | | 0.69 | | 0.66 | |

note: p<0.05 ( ** ), p<0.10 ( * )

## Discussion

This paper has focused on how and why desires and expectations for future children vary over time. This is a topic which has only recently began to be investigated systematically, made possible by the increase in the availability of longitudinal survey data (Beets, *et al*. 1999; Heaton, *et al.* 1999; Qu, *et al.* 2000; Mitchell and Gray 2007; Heiland, *et al*. 2008; Liefbroer 2008).

With regards to our first research questions regarding the general degree of stability in desires and expectations over time, we find that desires and expectations show considerable change over time. Individuals who had low desires and expectations, with a score of 0–3, had a highly stable response pattern across the waves. These results are similar, but not directly comparable to other studies (Heiland, *et al.* 2008; Liefbroer 2008) who find variation in another indicator, the total desired family size, stated by individuals at different points in time. Childbearing expectations, which were hypothesized to be more unstable and more affected by changing circumstance, did not in fact appear to be more unstable than desires. Overall, in both the cross-sectional and the longitudinal results, these two theoretically distinct indicators related to future fertility showed very little differences in how they responded to the independent variables. This could be because while in theory desires should be relatively free of considerations of current and future circumstances, in reality psychological mechanisms such as cognitive dissonance to some extent work to bring desires to be in line with expectations.

Our second research question was focused on the role of relationship status on desires and expectations for (further) childbearing. In line with previous research (Qu, *et al.* 2000; Mitchell and Gray 2007) we find that relationship status is a key determinant of intentions, both at the cross-section and longitudinally. In the change score analysis, individuals who formed new relationships or moved from cohabitations to marriages were more likely to have experienced an increase in the desire for children compared to those who were constantly married. Similarly in the fixed effects analysis, being in a relationship had a positive effect on desires and expectations, at all parities. This is not a surprising finding in that for most individuals being in a stable relationship is a necessary prerequisite for childbearing. The fact that changes in relationship formation were associated with changes in desires provide some support for the proposition that the cross-sectional finding that single individuals have lower desires than partnered people is not only due to a selection effect. It is quite likely that the low desire expressed by some single individuals is a reflection of their current circumstances, rather than an inherent aversion to childbearing *per se* (Qu, *et al.* 2000; Mitchell and Gray 2007). Given the close connection between relationship formation and childbearing, and the recent evidence from the 2006 Census that partnership rates have fallen overall (Weston and Qu 2007) and that there are increasing differentials in partnership status according to educational status and income (Heard 2008) more research is needed to understand how changes in relationship formation affect individual fertility decision making in different sections of society.

The existence of a two-child norm in Australia is confirmed by both the cross-sectional and longitudinal results. Individuals with two children were considerably less likely to desire or expect another child compared to those with zero or one child. However with respect to whether or not the birth of the first child increases the desire and expectation for further childbearing we do not have a decisive conclusion. The change

score analysis indicated that compared to those who were continuously childless, those who went from being childless to having one child during the period were not more likely to experience an increase or decrease in desires over time. On the other hand, the fixed effects model which used a different approach indicated that initially childless individuals had slightly lower intentions when they had a first child. Again we cannot directly compare these results to previous studies that have focused on different measures such as total desired family size (Heiland, *et al*. 2008). Those studies investigate whether someone who initially stated a desired family size of two, changed their minds and wanted a total of three children after they experienced first time parenthood. The measure we use relates to general childbearing desires which are decided on a child-by-child basis, so it is unlikely to reveal the effect of having a first birth in the same way. As we speculated, we assume that comparing desires soon before a birth (when desire is high) to soon after a birth may account for this result.

Controlling for parity and relationship status, increasing age was associated with lower desires and expectations. The fixed effects analysis also indicated that the effect of time passing had a greater dampening effect on individuals aged 35 and over compared to those under 35. Again this may be tied to an increasing realization as time passes among that there may not be time to have a(nother) child.

We have some suggestions for future research directions. Due to our inclusion of both partnered and unpartnered individuals, and individuals who were already parents as well as those who were still childless, we were unfortunately unable to include several key variables such as the age of the youngest child or the partner's desires. Such an omission could be associated with biased estimates. Partners' desires in particular have previously been shown to have a strong influence on fertility decision making and on the probability of having a future birth (Berrington 2004). It is likely for example, that entering into a new relationship with a partner who has high desires for childbearing will have a different effect on an individual's desires than entering a relationship with someone with very low desires. Similarly, when it comes to further childbearing in established relationships, if there is some disagreement between partners as to whether this is a desirable outcome or not (Voas 2003), the partner with the higher desire may relinquish and lower their desires and expectations over time. While HILDA does allow for the possibility of including the partner's intentions, in households where both partners were interviewed, they were not included in this study as our sample includes both partnered and un-partnered individuals.

The study also uses a relatively simple measure of employment and therefore perhaps does not capture how changes in more detailed financial and work-related factors such as income and hours worked may influence desires for children over time. The barrier to including variables such as hours worked however is that for women in particular they would have been closely related to childbearing.

This study also only follows individuals for a relatively short time period. The short duration left relatively little room for individuals to experience changes in circumstances, such as relationship and childbearing transitions which could then be related to changing desires and expectations. This is particularly true for the fixed effects models, which were split by parity, meaning that the number of life changes experienced for each of the groups was even smaller. A longer time period, say at least ten years or more, would give us a clearer indication of how desires and expectations are adjusted

with changing circumstances. This will be possible to do in the future, as more waves of data become available.

The study provides some insight into the psychology of fertility decision making at the individual level. It is apparent that fertility decision making is a highly complex behavior that is formed in interaction with wider macro-level forces (Mitchell & Gray 2007). As Merlo and Rowland (2000) note with regard to childless individuals, the role of factors such as relationship difficulties or inability to find a partner, financial constraints and postponement of childbearing in influencing childbearing has made it very difficult to separate out and distinguish between voluntary and involuntary childlessness. The same can be said regarding the transition to the second or third child. A better understanding of why or why not fertility preferences are translated into actual behavior, and an understanding of how desires for children change dynamically over the life course is key to understanding current fertility patterns and to devising effective policies.

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