Changes in Family Size Intentions Across Young Adulthood: A Life-Course Perspective
Evolution des intentions en matière de taille de famille en début d'âge adulte: une approche biographique

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Abstract   Recent years have witnessed a resurgence in the interest in family size intentions and ideals in developed societies, partially stemming from the idea that realized fertility in these societies is lower than intended fertility. This paper addresses the question of the stability of family size intentions. Based on Heckhausen's life-span theory of control, it is hypothesized that young adults' family size intentions are likely to change as a result of their experiences in the family and occupational life domains. To study this issue, data are used from a Dutch panel survey in which respondents are questioned on their family size intentions six times over the course of 18 years. The results show that family size intentions are not stable, but are adjusted as people age. On average, the adjustment is downward, but some people do not adjust their intentions or even adjust them upwards. Much of this difference in age patterns can be explained by changes in the partner, educational, and occupational careers of young adults. Not finding a suitable partner and pursuing a career—for women—are important factors. But also the timing of the fertility career itself is of major importance. If respondents postpone having children until their thirties, they are much more likely to adjust their intentions downwards than if they start their childbearing career earlier.

Keywords   Fertility intentions · Family size intentions · Stability of intentions · Life-course perspective · Panel survey

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Résumé Les intentions et les idéaux en matière de taille de famille ont connu un regain d'intérêt dans les sociétés développées au cours des années récentes, en partie sur la base du constat que la fécondité réalisée était plus basse que la fécondité souhaitée. Cet article s'intéresse à la question de savoir si les intentions en matière de fécondité sont stables ou pas. A partir du "*life-span theory of control*" de Heckhausen, l'hypothèse émise est celle d'un changement des intentions des jeunes adultes en matière de taille de famille en fonction de leurs expériences dans les domaines de la famille et de la vie professionnelle. Les données exploitées sont celles d'un panel Néerlandais au sein duquel les sujets ont été interrogés sur leurs intentions en matière de taille de famille à 6 reprises sur une période de 18 ans. Les résultats indiquent que les intentions ne sont pas stables, et qu'elles sont ajustées au fur et à mesure que l'âge avance. En moyenne, l'ajustement se fait à la baisse, mais certaines personnes ne varient pas, et d'autres ajustent à la hausse. Beaucoup de ces différences d'évolution avec l'âge peuvent être expliquées par des changements dans l'histoire des unions, le parcours éducatif et les carrières professionnelles des jeunes adultes. Ne pas réussir à trouver un partenaire et poursuivre une carrière professionnelle—pour les femmes—sont des facteurs importants. Le calendrier des naissances est également d'une importance capitale. Les sujets qui reportent la procréation jusqu'à la trentaine ont une probabilité beaucoup plus forte d'ajuster leurs intentions à la baisse que ceux qui débutent plus tôt.

Mots-clés Intentions en matière de fécondité · Intentions en matière de taille de famille · Stabilité des intentions · Perspective biographique · Etude de panel

1 Introduction

European societies are currently characterized by below-replacement fertility, a situation that has caused concern among policy makers about the future demographic sustainability of these societies. This context has fuelled renewed interest in the concept of intended family size, as a discrepancy between intended and achieved family size could signal the existence of an 'unmet need' for children. Recent studies have indeed shown that intended fertility generally is higher than realized fertility, both at the societal level (Goldstein et al. 2003; Van de Kaa 2001) and at the individual level (Quesnel-Vallée and Morgan 2003; Symeonidou 2000; Testa and Toulemon 2006).

A potential drawback of many studies that examine family size intentions and ideals is that they treat family size intention as a rather static concept. However, Quesnel-Vallée and Morgan (2003) for US women and Heiland et al. (2008) for West German women have shown that intended and desired parity varies and overall decreases somewhat as women age, suggesting that family size intentions are dynamic rather than static. Moreover, it could well be that variation exists in the extent to which young adults change their family size intentions over the life course. It could be that some people hardly change their intentions at all, whereas the intentions of other people change considerably as they grow older. Currently, we

simply do not know how much age-related variation exists in these patterns. Therefore, the first research question this paper wants to address is *how stable are the family size intentions of young adults across the reproductive life span?*

If people's family size intentions change as they grow older, this raises the issue of why this is the case. Why do some people adjust their family size intentions downwards, whereas others do not or even adjust them upwards? Régnier-Loilier (2006) suggests that this is done because many young adults who want to have multiple children are confronted with unexpected constraints—either of a biological or a social nature—in trying to realize these intentions, and respond by adjusting their plans downwards. However, until now, no longitudinal studies have been performed to test these ideas. An examination of the factors that influence age-related change in family size intentions might give us a better understanding of why some people do not realize the family size intentions they had early in life, whereas others do realize their intentions or even have more children than they had expected early in life. Therefore, my second research question is *how can we explain differences between young adults in the stability of their family size intentions across the reproductive life span?*

In answering the second research question, I will develop and test a number of hypotheses that are mainly derived from Heckhausen's (1999) life-span theory of control. This developmental theory suggests that people adjust their family size intentions if it becomes unlikely that the 'proper' conditions for realizing these intentions will be met. To examine this issue, I will analyse data from a six-wave panel study in the Netherlands, spanning a period of 18 years (Liefbroer and Kalmijn 1997). Random-slope multilevel modelling will be used to examine the extent to which age-related variation in family size intentions can be explained.

2 Background and Hypotheses

Both cross-sectional (Régnier-Loilier 2006; Testa and Grilli 2006) and longitudinal studies (Heiland et al. 2008; Quesnel-Vallée and Morgan 2003) show that young adults in their thirties have lower average family size ideals and intentions than young adults in their twenties. Régnier-Loilier (2006) suggests that this downward shift in intended family size is related to changes in external life circumstances like marriage break-up or unemployment, or to changes in the fertility career itself, such as reduced fecundity or negative experiences with child rearing. In short, as they age, young adults are faced with new and unexpected constraints, and this leads to a re-assessment of their family size intentions. These ideas are partially corroborated by recent research of Heiland et al. (2008), who, using data from a German two-wave panel study, find that the stability of family size desires depends on level of education, income and marital status. However, a general model to explain changes in family size intentions and to explain why some young adults change their intentions while others do not is lacking. Heckhausen's life-span theory of control and her concept of developmental regulation (Heckhausen 1999; Heckhausen and

Schulz 1995; Wrosch and Heckhausen 2005) offer a promising general framework to study these issues and to generate hypotheses about the factors that influence age-related change in family-size intentions.

2.1 Life-span Theory of Control

The key contention of the life-span theory of control (Heckhausen 1999; Heckhausen and Schulz 1995; Wrosch and Heckhausen 2005) is that—throughout the life span—individuals set developmental goals and use a variety of control strategies to realize these goals or—if realizing these goals turns out to be impossible—to minimize the negative consequences of the failure to realize them. Two broad types of control strategies are distinguished: primary and secondary control. *Primary control* refers to behavioural acts of individuals to actively change their environment in accordance with their needs and wishes. *Secondary control* refers to intra-psychic responses to challenges posed by the environment and includes activities to change one's mental representations, motivations and emotions. Within both types of control, two further subtypes are distinguished. *Selective primary control* refers to investments made by individuals themselves— e.g. in terms of time and money—to realize their goals. *Compensatory primary control* refers to strategies to seek assistance—e.g. from others or by using technical appliances—if one's own efforts do not suffice. *Selective secondary control* refers to strategies to increase one's own commitment to the realization of developmental goals, like efforts to heighten the value of a goal or to increase faith in one's own ability to realize the goal. *Compensatory secondary control*, finally, refers to mental and motivational activities to disengage oneself from a developmental goal once it becomes unlikely or impossible to attain. The first three types of control are useful to maximize one's chances of realizing selected goals, whereas compensatory secondary control is important to minimize the negative consequences of failure to realize these goals. Adjustment of intentions can be viewed as a specific compensatory secondary control strategy that individuals use once they realize that attainment of a goal is becoming unlikely.

Both the selection of developmental goals and the use of different types of control strategies depend on life-course related opportunities and constraints (Heckhausen 1999; Heckhausen and Schulz 1995; Wrosch and Heckhausen 2005). Three general types of such life-course related factors are distinguished: biological, socio-structural or institutional, and age-normative factors. Biological factors refer to age-related changes in physical and psychological functioning. Some of these capacities—e.g. cognitive skills—change gradually across the life span, whereas others—e.g. the capacity to bear children—change within a relatively limited period of time. Socio-structural and institutional factors also influence the formulation and realization of developmental goals. Societal regulations—laws, educational and occupational career tracks, institutional arrangements—structure the life course and increase the likelihood that many people experience the same kind of events at roughly the same stage of the life course (Buchmann 1989; Hagestad and Neugarten 1985; Mayer and Müller 1986; Meyer 1988). Finally, age-normative conceptions— norms about the 'proper' timing and sequencing of events—influence individuals'

developmental goal setting and control mechanisms. In many societies, there exist more or less explicit ideas about when, and in what order events in the life course should occur (Neugarten et al. 1965; Hagestad and Neugarten 1985; Settersten and Hagestad 1996), and such scripts help people to find out whether they are on-time or off-time, and thus inform them whether to use control strategies that lead to goal realization or to goal disengagement.

For many developmental goals an upper age exists after which realization of that goal becomes unlikely or impossible (Settersten and Hagestad 1996). The life-span theory of control suggests that most individuals will try to realize their goals before this age deadline is reached, and thus will heavily invest in primary control and selective secondary control mechanisms. Compensatory secondary control strategies are likely in two cases. First, such strategies, like *intention disengagement*, will be used if an individual has been unable to realize a developmental goal and the age deadline has passed. Second, *adjustment of intentions* is also likely to occur before an age deadline is reached if individuals anticipate that it will be hard or impossible to realize the goal. Such a pre-decisional secondary control strategy is used in order to avoid disappointment if failure is expected to occur (Heckhausen and Schulz 1995, p. 288).

Hypotheses based on this theory have been corroborated in studies on major events in the life course like getting an apprenticeship at the end of vocational schooling (Heckhausen and Tomasik 2002), finding an intimate partner (Wrosch and Heckhausen 1999), and having a child (Heckhausen et al. 2001). In this last study, childless women who had passed the deadline for having a child were found to engage much more in compensatory secondary control strategies—like downgrading the value of children and upgrading the importance of alternative developmental goals—than women with children who had passed the deadline or childless women who had not yet reached the deadline. The latter group was more likely to use selective primary and secondary control. The study by Heckhausen and Tomasik (2002) on finding an apprenticeship is interesting because it provided clear evidence of pre-decisional intention adjustment. Students who had very high aspirations compared to their grades downgraded these aspirations in anticipation of the deadline at which they needed to have found an apprenticeship, whereas students who held aspirations that were more or less in line with their capacities did not change these aspirations.

2.2 Applying the Life-span Theory of Control to the Development of Family Size Intentions

The life-span theory of control offers a number of insights that can be used to generate hypotheses about age-related change in family size intentions and about inter-individual differences in these age-related patterns. To start with, it is important to realize that family size intentions are 'complex' intentions in several respects. First, if individuals intend to have multiple children, the realization of this intention implies that a sequence of events has to occur; delay or non-occurrence of the first birth in the sequence will decrease the chances of having subsequent children and thus will make the realization of their full family size intentions harder

to attain or even impossible. Second, the realization of family size intentions will often depend on the occurrence or non-occurrence of events in other life-domains. Given that having a steady partner relationship and having a steady job are often considered as a prerequisite of childbearing (Settersten and Hagestad 1996), delays and setbacks in these related life domains will influence the realization of family size intentions.

In modern societies, young adults are constantly reminded of the need to manage their own life and to plan their future (Giddens 1991; Settersten 2007). At the same time, young adults are acutely aware of the uncertainty that the future holds, and that plans are provisional and have to be malleable (Anderson et al. 2005; Beck and Beck-Gernsheim 2002; Brannen and Nilsen 2002; Furlong and Cartmel 1997; Giddens 1991). Thus, when individuals are asked early in young adulthood about their family size intentions, one can assume that most of them are aware of the potential pitfalls on the road to completed fertility and of the provisional nature of these intentions. At the same time, most young adults feel confident—and sometimes overly confident—about their ability to realize their future plans (Arnett 2000; Weinstein 1980). However, as they grow older, the life trajectories of young adults start to diverge. Some experience life events—such as finding a suitable partner and finding a well-paid job—that favour the realization of their initial intentions, whereas others are not so successful. As they grow older, the latter group may become aware that their initial family size intentions will be hard to realize. They may thus use what Heckhausen and Schulz (1995) call 'predecisional secondary control strategies', i.e. they may adjust their family size intentions downwards. Although it is also conceivable that some individuals will adjust their family size intentions upwards as they age—e.g. because of favourable experiences with the children they already have or because they already had children from a previous relationship, have started a new relationship and want children with this new partner—upward adjustment is generally much less likely than downward adjustment. Thus, differential life trajectories and the concomitant anticipatory control strategies lead to the first two hypotheses:

H1a: On average, the family size intentions of young adults will be adjusted downwards with increasing age.

H1b: As young adults age, the variation in family size intentions will increase.

As suggested above, the age-sequential nature of the life course (Hagestad and Neugarten 1985; Settersten and Hagestad 1996; Settersten 1997) makes it more likely that young adults will engage in parenthood once other important developmental goals have been achieved. Partnership is probably the foremost among these prerequisites. Therefore, young adults who have a partner relationship can be expected to have higher family size intentions than young adults without a partner relationship (Clarkberg 2002). In addition, earlier research has shown that those who cohabit unmarried, either through selection or because they are accustomed to a lifestyle that provides little room for having children, have less favourable attitudes towards parenthood than young adults who are married (Beets et al. 1999; Clarkberg 2002), and therefore cohabitants may have lower family size intentions than married

or dating young adults. In addition, as they grow older, young adults who have not yet entered into a steady relationship will presumably be troubled by the fact that the prerequisite for childbearing has not yet been met, and thus be more likely than young adults who have a steady partner relationship to adjust their intentions downwards. These considerations lead to the following two hypotheses:

H2a: Young adults who have no partner or are cohabiting unmarried will have lower family size intentions than dating and married young adults.

H2b: The difference in the family size intentions between young adults without a partner and young adults with a partner will increase as they grow older.

It is possible that events and experiences in the educational and occupational life domains will also influence the family size intentions of young adults and that these experiences will influence these intentions more strongly as young adults grow older. However, the exact nature of these effects is much less clear than for events and experiences in the partnership career. Particularly for men, it is hard to predict how the occupational and educational career will influence their family size intentions. On the one hand, one could argue that—in families where the man is the main breadwinner—men who spend more hours in paid employment will also have higher family size intentions, as they can afford to have more children. On the other hand, one could argue that—if men value involvement in childrearing—men who work more will have lower family size intentions. For women, the situation in the Netherlands where the compatibility between motherhood and paid employment is not very favourable (Liefbroer and Corijn 1999) seems to be more clear-cut. Especially higher educated women, who aspire to a career, may have a hard time combining motherhood and paid employment. Thus, higher educated women and women who spend more hours in paid work may have lower family size intentions. In addition, it is possible that women—and men—will have lower family size intentions while enroled in education, as education and fertility are often thought to be incompatible activities (Blossfeld and Huinink 1991). Finally, it seems likely that young adults will become increasingly aware of the barriers against combining motherhood and a career as they grow older. Given that the effects of education and occupation on family size intentions are much less clear for men than for women, explicit hypotheses are formulated for women only (although effects will also be examined for men):

H3a: The more hours young adult women work and the higher their level of education, the lower their family size intentions will be.

H3b: The difference in the family size intentions between young adult women with different numbers of working hours and with different levels of education will increase as they grow older.

Events in the fertility career itself probably exert the strongest influence on the family size intentions of young adults. First, biological factors may play a role. Young adults may turn out to be infecund or to have reduced fecundity, and experience problems in having children as a result. Young adults usually become aware of such biological barriers only gradually, and therefore it can be expected

that the differences in family size intentions between young adults with a different number of children will be small early during young adulthood and increase with age (Clarkberg 2002). Related aspects that can influence young adults' family size intentions are experiences during pregnancy and childrearing. If a woman experiences problems during pregnancy or during delivery, this may lead her to consider whether she wants to run the risk of experiencing such problems again, leading, in turn, to downward adjustment of family size intentions. Experiences with childrearing can either be more positive than expected or more negative. Although both outcomes are possible, the general tendency of people to be somewhat overoptimistic about the future (Weinstein 1980), makes it more likely that the actual childrearing experiences will be somewhat more negative than expected than the other way round. In sum, these considerations lead to the following hypotheses:

H4a: The more children young adults have, the higher their family size intentions will be.

H4b: The difference in the family size intentions between young adults with different numbers of children will increase as they grow older.

3 Method

3.1 Data

The data for this study come from the Panel Study on Social Integration in the Netherlands (PSIN) (Liefbroer and Kalmijn 1997).[1] This study follows the process of social integration of young adults within the crucially important life domains of living arrangements and family formation, and education and occupation. The panel study consists of six waves of data collection among a random sample of Dutch young adults of the 1961, 1965 and 1969 birth cohorts. Data were collected in 1987 (Wave 1), 1989 (Wave 2), 1991 (Wave 3), 1995 (Wave 4), 1999/2000 (Wave 5) and 2005/2006 (Wave 6). Respondents were aged around 18, 22 and 26 at the time of the first survey wave in 1987, and were around 36, 40 and 44 years in 2005/2006, when the last survey wave was conducted. Waves 1, 3 and 4 consisted of a combination of a face-to-face interview and an additional self-administered questionnaire. Wave 2 and wave 6 consisted of a mail questionnaire. Wave 5 combined a computer-assisted telephone interview and an additional self-administered questionnaire.

In 1987, a random sample was drawn of Dutch men and women born in 1961, 1965 and 1969. The sample was stratified according to birth cohort and sex. Municipal population registers were chosen as the sampling frame as these registers offer an accurate record of all inhabitants living in a municipality and offer the

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[1] The first three waves of the PSIN were organized and conducted by the Departments of Social Research Methodology and Organizational Psychology of the VU University Amsterdam. The fourth wave was conducted by Utrecht University (UU), the fifth wave was conducted jointly by UU and the Netherlands Interdisciplinary Demographic Institute (NIDI). The sixth wave was conducted by UU, NIDI and Tilburg University.

possibility of drawing a stratified sample. A total of 1,775 interviews were conducted in the first wave, with a response rate of 63.4%. A total of 1,419 respondents participated in Wave 2 (79.9% of the original sample), 1,257 in Wave 3 (70.9%), 962 in Wave 4 (54.2%), 836 in Wave 5 (47.1%) and 770 in Wave 6 (43.4%). For this study, data on young adults from all six waves are used.

To evaluate the consequences of the initial non-response and the attrition between waves, I calculated the mean number of children of female respondents, separately per birth cohort and per wave and compared this with population data on the mean number of children of women from these birth cohorts at the time of the respective waves (as published by Statistics Netherlands). The mean of the absolute differences between the number of children in the population and in the sample was 0.08, suggesting that the difference in number of children between the population and the sample was relatively small. In addition, no indications of systematic over- or underestimation of number of children in the sample were found. Unfortunately, it is not possible to reweigh the sample based on the number of children, as no population data on the number of children of men are available. It is possible, however, to reweigh the sample so that the proportion of married respondents by gender, cohort and wave resembles that in the population. After reweighing the sample in this way, the mean of the absolute differences between the number of children in the population and in the sample became even smaller (0.06) than without reweighting. Therefore, weighted observations will be used in all analyses.

3.2 Variables

Family size intention is the dependent variable of interest. The question wording used to measure this intention slightly differed across the waves of the survey. In all waves except wave 2, a two-step procedure was used. In the first step, respondents were asked if they intended to have (additional) children in the future. If respondents answered that they probably or definitely intended to have children in the future, they were asked how many additional children they wanted to have. Intended family size was calculated as the sum of the current family size and the additionally intended number of children. In wave 2, a one-step procedure was used in which respondents were asked directly how many children they eventually wanted to have.

A number of time-varying independent variables are defined that can change their value between survey waves. *Age* is defined in years since birth. In the multivariate analyses, this variable is centred around the mean age of respondents across all waves (28.1 years). Preliminary analyses showed that the family size intentions in waves 2 and 5 differed systematically from those reported in other waves, with intentions in wave 2 being somewhat lower than in other waves and intentions in wave 5 being somewhat higher. To control for this difference, two dummy variables (*Wave 2* and *Wave 5*) were included in the multivariate analyses. *Living with parents* is a time-varying dummy variable that takes a value of 1 if respondents are living with one or both parents and 0 otherwise. Four different partner statuses are defined: having no partner, steady dating, cohabiting unmarried and being married. Based on these four statuses, three dummy variables were

created: *Steady dating*, *Cohabiting* and *Married*. Not having a partner constitutes the reference category. Three time-varying variables with information on the educational and occupational status of respondents were created. *Educational attainment* is a continuous variable that measures the highest level of education that a respondent has attained in each wave, based on the number of years after primary school that it usually takes to acquire this level. This variable has a range from 0 (no completed education after primary school) to 11 (attained a university degree). *Being in education* is a dummy variable that takes a score of 1 if a respondent is enroled in any type of full-time education. *Number of working hours* is a continuous variable that measures the number of hours per week that a respondent is active in a paid job. If respondents stated that they were active for more than 60 hours per week, their number of working hours were set to 60. Finally, time-varying information on the actual number of children born to respondents is included. To allow for possible non-linear effects, two time-varying dummy variables were created. If respondents had one child, they got value 1 on the variable *One child*. If they had two or more children, they got a value of 1 on the variable *Two+ children*. Respondents having no children constituted the reference category.

In addition to the time-varying independent variables, two time-constant independent variables are included in the analyses as well. *Man* is a dummy variable that takes value 1 if the respondent is male and value 0 if the respondent is female. Three birth cohorts (1961, 1965 and 1969) were present in the dataset. Two dummy variables were created: *Cohort 1965* and *Cohort 1969*, with the oldest birth cohort (1961) being the reference category. Mean scores on all independent variables across all waves are presented in Table 1.

3.3 Analytical Strategy

To analyse the age-related change in family size intentions, random-slope multilevel models are estimated (Snijders and Bosker 1999). Multilevel modelling is used because the data have a two-level structure: occasions (waves) are nested within persons. A random-slope model is estimated because I am interested in examining whether the age-related change in family size intentions varies between respondents, and whether this variation in the slope can be explained by differences between individuals in their experiences in the family and the occupational life domains.

The basic specification of the random-slope model is:

$$\text{FamInt}_{ij} = \beta_{0j} + \beta_{1j}\,\text{Age}_{ij} + \beta_z X_{ij} + R_{ij}, \tag{1a}$$

with

$$\beta_{0j} = \gamma_{00} + U_{0j} \tag{1b}$$

$$\beta_{1j} = \gamma_{10} + U_{1j}. \tag{1c}$$

The wave-specific family size intentions (FamInt_{ij}) of individuals are the result of a person-specific intercept (β_{0j}), a person-specific effect of age ($\beta_{1j}\,\text{Age}_{ij}$), a set of fixed additional effects ($\beta_z X_{ij}$) and a wave-specific random error component (R_{ij}).

Table 1 Descriptive information on variables used in the multivariate analyses

Variable	M	SD
Intended number of children	2.16	1.07
Age	28.13	6.94
Women	0.52	
Men	0.48	
Cohort 1961	0.35	
Cohort 1965	0.32	
Cohort 1969	0.33	
Wave 1	0.27	
Wave 2	0.20	
Wave 3	0.18	
Wave 4	0.12	
Wave 5	0.12	
Wave 6	0.11	
Living with parents	0.23	
Not living with parents	0.77	
No partner relationship	0.24	
Steady dating	0.18	
Cohabiting	0.16	
Married	0.42	
In full-time education	0.18	
Not in full-time education	0.82	
Number of working hours	25.20	18.23
Level of education	5.60	2.42
No children	0.66	
One child	0.11	
Two or more children	0.23	
Number of observations	6,342	
Number of respondents	1,745	

This differs from a 'normal' single-level regression model in that the person-specific coefficients (β_{0j} and β_{1j}) can be split into an average effect (γ_{00} and γ_{10}) and a person-specific deviation from this average effect (U_{0j} and U_{1j}). In this model, it can be empirically tested whether the age-related change in family size intentions varies between individuals. If so, var(U_{1j}) has to differ from 0. Furthermore, one can try to 'explain' the person-specific variation in this random slope by introducing explanatory variables and examining to what extent the variation in U_{1j} is reduced by their introduction. In this particular application, I will examine to what extent the variation in U_{1j} is reduced by introducing information on respondents' positions in the family and occupational life domains. It is expected that part of the differences between individuals in the age-gradient of their family size intentions result from differences between these individuals in their positions in the family and

occupational life domains. In addition, it is expected that differences between individuals in the positions in these life domains will have a stronger influence on their family size intentions at older ages. Therefore, interactions between these positions and age itself will be added to the model, and it is expected that these interactions will partly explain between-person variation U_{1j} in the age slope.

Because most people intend to have only few children, and because people cannot intend to have fewer than zero children, the Poisson model is better suited to model these data than the Normal model. This has two important consequences for our analysis. First, this model is non linear, as the dependent variable is transformed to the logarithm of the family size intentions. Second, the Poisson model assumes that the variation of the dependent variable is equal to its mean. As this is not the case for family size intentions (the variation is about half the mean), we allow the variation at the lowest level (R_{ij}) to be free, rather than constrained to 1. All models are estimated using *MLwiN* 2.02 (Rasbash et al. 2005).

4 Results

4.1 Descriptive Results

Before presenting the results of the multivariate analyses, descriptive information on changes in family size intentions and the extent to which initial intentions are realized, will be presented. I will restrict my attention to men and women born in 1961, who have been followed between the ages of 26 and 44. Because hardly any women and only few men will have additional children after age 44, their realized fertility at age 44 can safely be assumed to be almost equal to the completed fertility of men and women from this birth cohort, and the difference between the stated intentions at age 26 and the realized fertility at age 44 can be seen as indicative of the extent to which realized family size falls short of intended family size.

Figure 1 plots the change in family size intentions across waves and compares this to the change in actual family size. It shows that the average intended family size of women and men decreases as they grow older. At age 26, women and men of the 1961 birth cohort intended to have an average of 2.42 and 2.30 children, respectively. This intended family size decreases to 2.05 and 2.06 for women and men at age 34, and to 2.01 and 1.99 for women and men at age 39. Actual family size at age 44 for these respondents is 1.95 for women and 1.81 for men.[2] Therefore, the mean difference between intended family size at age 26 and actual family size at age 44 for men and women of this birth cohort is almost 0.5 children. Additional analyses on the change in family size intentions for the 1965 and 1969 cohorts confirm the pattern of decreasing intentions as people grow older. The family size intentions of these younger cohorts are on average somewhat lower than those of the 1961 cohort, and show more or less the same age pattern, though it is somewhat less smooth (results not shown).

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[2] The mean number of children of all women born in 1961 is 1.78 (Statistics Netherlands). Thus, in the PSIN 1961 cohort sample women with more children are somewhat overrepresented.
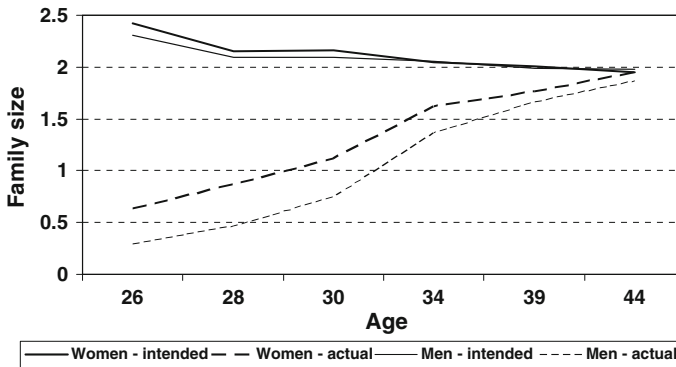
Fig. 1 Intended and actual family size of respondents born in 1961, by age and sex

The deficit of almost 0.5 children between intended family size at age 26 and actual family size at age 44 suggests that quite a few respondents have fewer children than originally intended. This is true; 44% of the women and 37% of the men end up with a smaller family than intended 18 years earlier. Almost an equal percentage of women (42%) and somewhat more men (48%) achieve the number of children they wanted to have when they were 26. Finally, 13% of the women and 15% of the men ended up with more children than originally intended. Of the men and women who ended up having less children than originally intended, about half had one child less and the other half had two or more less. Of those who ended up having more children than originally intended, most had one more than intended at age 26.

4.2 Multivariate Results

The results presented in the previous section show that there is a substantial difference between the family size intentions expressed by respondents in 1987 and the actual number of children they had in 2005. On average, respondents seem to anticipate this generally lower outcome by lowering their intentions as they age. At the same time, the results show that a substantial proportion of respondents do realize their intentions, and some even end up with more children than initially intended. This brings me to my original two research questions: to what extent do respondents differ in how they adjust their family-size intentions as they grow older? and can we explain why some respondents adjust their intentions downwards, whereas other do not or even adjust them upwards? To answer these questions, a series of random-slope multilevel Poisson regression models were estimated, presented in Table 2.

To start with, I estimated a random-slope model with a constant term and an age effect only (Model 1 in Table 2). The negative age effect confirms the observation in Fig. 1 that, on average, family size intentions are adjusted downwards with increasing age. At the same time, the level-2 variance for age differs from 0 to a statistically significant degree. There is variation between persons in the

Table 2 Results of selected Poisson multilevel models, with intended family size as the dependent variable

	Model 1		Model 2		Model 3		Model 4		Model 5	
	coef.	s.e.	coef.	s.e.	coef.	s.e.	coef.	s.e.	coef.	s.e.
Constant	0.6577**	0.0130	0.7539**	0.0243	0.6624**	0.0359	0.6521**	0.0461	0.4542**	0.0459
Age	−0.0174**	0.0013	−0.0225**	0.0014	−0.0352**	0.0035	−0.0253***	0.0044	−0.0427**	0.0043
Man			−0.0431*	0.0216	−0.0311	0.0218	−0.0753*	0.0385	−0.0388	0.0389
Cohort 1965			−0.0684*	0.0285	−0.0564	0.0290	−0.0554	0.0289	−0.0793**	0.0281
Cohort 1969			−0.1701**	0.0281	−0.1689**	0.0312	−0.1588***	0.0315	−0.1741**	0.0309
Wave 2			−0.0442**	0.0096	−0.0446**	0.0098	−0.0505***	0.0098	−0.0549**	0.0099
Wave 5			0.0830**	0.0137	0.0795**	0.0138	0.0802***	0.0140	0.0926**	0.0141
Living with parents					−0.0330	0.0214	−0.0153	0.0214	−0.0306	0.0216
Steady dating					0.1020**	0.0303	0.0987***	0.0305	0.1006**	0.0287
Steady dating * age					0.0092*	0.0043	0.0100*	0.0044	0.0070	0.0040
Cohabiting					0.0120	0.0304	0.0189	0.0306	0.0337	0.0288
Cohabiting * age					0.0118*	0.0049	0.0137***	0.0050	0.0034	0.0044
Married					0.1357**	0.0269	0.1486***	0.0274	0.1485***	0.0266
Married * age					0.0147**	0.0036	0.0158***	0.0037	−0.0115***	0.0037
In full-time education							0.0317	0.0238	0.0230	0.0250
Number of working hours							−0.0005	0.0004	−0.0004	0.0004
Number of working hours * age							−0.0001*	0.0001	−0.0002**	0.0001
Level of education							−0.0005	0.0060	0.0119*	0.0054
Level of education * man							0.0136*	0.0067	0.0126	0.0065
Level of education * age							−0.0017**	0.0006	−0.0016**	0.0004
Level of education * age * man							0.0010*	0.0005	0.0010***	0.0004
One child									0.1947**	0.0221
One child * age									0.0201**	0.0047

Table 2 continued

|	Model 1		Model 2		Model 3		Model 4		Model 5	
	coef.	s.e.	coef.	s.e.	coef.	s.e.	coef.	s.e.	coef.	s.e.
Two + children									0.2392**	0.0233
Two + children * age									0.0491**	0.0041
Level 2 random effects										
$\tau_0^2 = \mathrm{var(constant)}$	0.2102**	0.0144	0.2116**	0.0147	0.1975**	0.0137	0.1939**	0.0135	0.1470**	0.0102
$\tau_1^2 = \mathrm{var(age)}$	0.0011**	0.0001	0.0012**	0.0001	0.0011**	0.0001	0.0010**	0.0001	0.0003**	0.0001
$\tau_{01} = \mathrm{cov(constant,\ age)}$	0.0094**	0.0009	0.0102**	0.0009	0.0091**	0.0009	0.0089**	0.0009	0.0026**	0.0005
Level 1 variance										
$\sigma^2 = \mathrm{var(constant)}$	0.2506**	0.0106	0.2469**	0.0103	0.2488**	0.0102	0.2488**	0.0102	0.2600**	0.0103
Number of observations	6,342		6,342		6,342		6,342		6,342	
Number of respondents	1,745		1,745		1,745		1,745		1,745	

* $P < 0.05$, ** $P < 0.01$
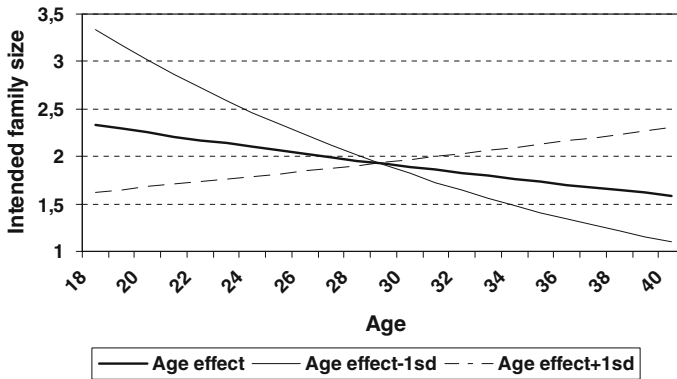
Fig. 2 Hypothetical change in family size intentions, based on Model 1 in Table 2

age-gradient of family size intentions. To get an idea of the spread of the age gradient, the standard deviation of the age coefficient can be estimated by taking the square root of the variance ($\sqrt{0.0011} = 0.033$). In Fig. 2, three age patterns are plotted. The bold line represents the age pattern for respondents with the mean age effect (-0.017), the dotted line the age pattern for respondents with an age effect that is one standard deviation above the mean age effect ($-0.017 + 0.33$) and the thin line the age pattern for respondents with an age effect that is one standard deviation below the mean age effect ($-0.017 - 0.33$). As one can see from this figure, some respondents will reduce their family size intentions much more strongly than is the case for the 'average' respondent, but there will also be respondents who adjust their family size intentions upwards. A final thing to note about Model 1 is the positive and statistically significant covariance between the constant and age effects. This positive covariance implies that the variation in family size intention scores increases with age; in other words, as respondents grow older, there is increasing divergence. Taken together, the results of Model 1 confirm the first hypothesis: on average, the family size intentions of young adults will be adjusted downwards with increasing age (H1a). At the same time, considerable variation in age patterns exists, and this variation increases with age (H1b).

A number of hypotheses were formulated to explain the variation in the age coefficient. It was suggested that this variation depends on respondents' positions in the family and occupational domains. These hypotheses will be tested in subsequent models presented in Table 2. In Model 2, the base model is expanded with a few control variables. Sex is added to control for differences between men and women, cohort dummies are added to control for differences in family size intentions between cohorts and dummies for waves 2 and 5 are added to control for the fact that the family size intentions in these two waves differed somewhat from those in the other waves. Men have slightly lower fertility intentions than women, respondents from younger birth cohorts have lower fertility intentions than respondents from older birth cohorts, and intentions in wave 2 are lower and in wave 5 higher than in other waves. These variables do not explain much of the between-person variations in either the mean or the age effect. In fact, these effects
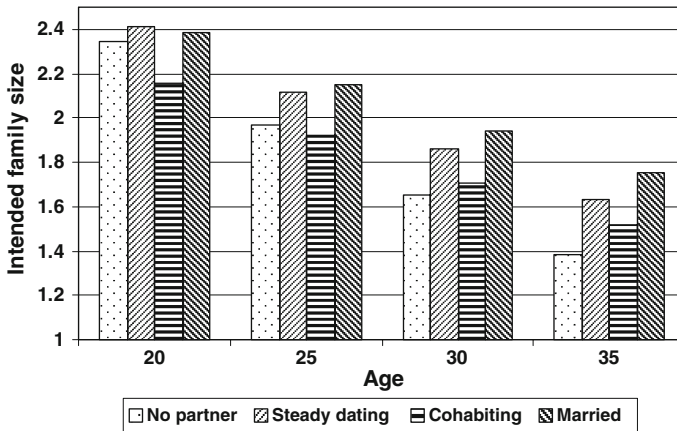
Fig. 3 Family size intentions by age and partner status, based on Model 3 in Table 2

become slightly larger, suggesting that the differences between persons are even larger after inclusion of these control variables.

In Model 3, information about the living arrangements of respondents is added to the model. Included are main effects for whether respondents live with their parents or not, and for their partner status (no partner constitutes the reference category). In addition, interaction effects of partner status and age are added. The interaction between living with parents and age turned out to be non-significant and is left out of the model to keep it as parsimonious as possible. The dummy for living with parents is non-significant, indicating that family size intentions do not differ between respondents who live in the parental home and those who have left home. Partner status both has statistically significant main and interaction effects on family size intentions. Given that age is centred around age 28.1, the main effects of partner status imply that at age 28, respondents who are steady dating or are married have higher family size intentions than respondents who have either no partner or are cohabiting unmarried. In addition, there are statistically significant positive interaction effects between age and steady dating, cohabitation and marriage. This implies that the difference in family size intentions between respondents who have a partner and those who do not increases as they grow older. To illustrate this, Fig. 3 shows the average family size intentions of respondents without a partner, those who are steady dating, those who are cohabiting unmarried and those who are married, at ages 20, 25, 30 and 35, based on the coefficients of Model 3.[3] At age 20, cohabiting respondents have intentions that are—on average—0.2 children lower than that of other respondents. As they grow older, the average family size intentions of all four groups decline, but this decline is largest among respondents without a partner. By age 35, their average family size intentions are just 1.4, far lower than that of all the others. At the same time, respondents who cohabit have clearly lower family size intentions than both dating and married respondents. These results confirm the second hypothesis: there are differences in family size intentions

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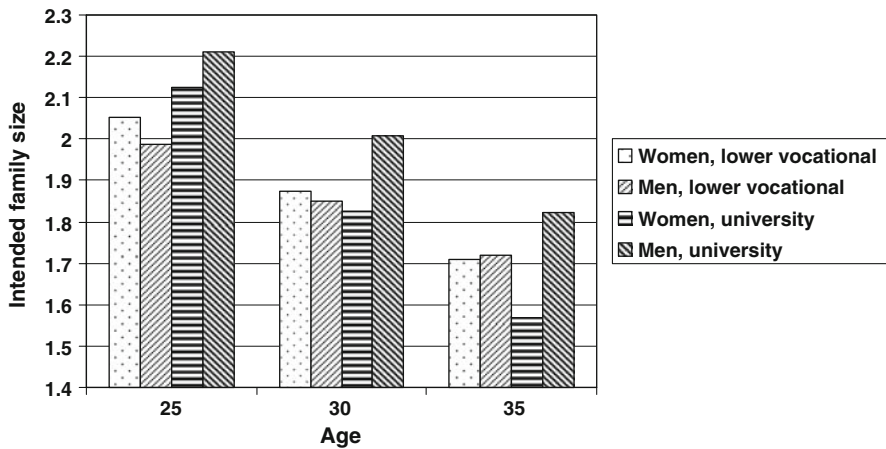[3] The other variables in the equation are set equal to their mean value.

Fig. 4 Family size intentions by gender, age and level of education, based on Model 4 in Table 2

between respondents in different living arrangements (H2a) and the differences between respondents with and without a partner grow larger with increasing age (H2b). Finally, it can be noted that adding living arrangement information to the model explains part of the level-2 variation in the model: 6.7% of the level-2 variance of the mean family size can be explained $(((0.2116 - 0.1975)/0.2116) \times 100)$, 9.5% of the variance in the age effect, and 11.0% of the covariance between mean and age slope.

In Model 4, information on the educational and occupational career of respondents is included. Whether respondents are enrolled in full-time education or not does not influence their family size intentions. In addition, the effect of being in full-time education does not differ between men and women and does not depend on the respondent's age (results not shown). The number of working hours interacts negatively with age. Interpreted together with the main effect, this implies that the number of working hours does not influence the family size intentions during the respondents' twenties, but has an increasingly negative effect during their thirties. The higher the number of hours that respondents—both women and men—in their thirties spend in paid employment, the lower their family size intentions. Finally, the family size intentions of respondents differ according to their level of education. However, these patterns differ between men and women and are age-dependent. To illustrate this, Fig. 4 shows the mean family size intentions of male and female respondents with a lower vocational education (4 years of education after primary school) and with a university degree (11 years of schooling after primary school) at ages 25, 30 and 35.[4] At age 25, respondents with a completed university education have a higher intended family size than those who completed lower vocational education only. In addition, male respondents with a university education have higher intentions than female respondents who completed university, but the

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[4] The time-constant variables in the equation are set equal to their mean value, and the time-varying variables are set to their mean value in the age groups 23–27, 28–32 and 33–37, respectively.
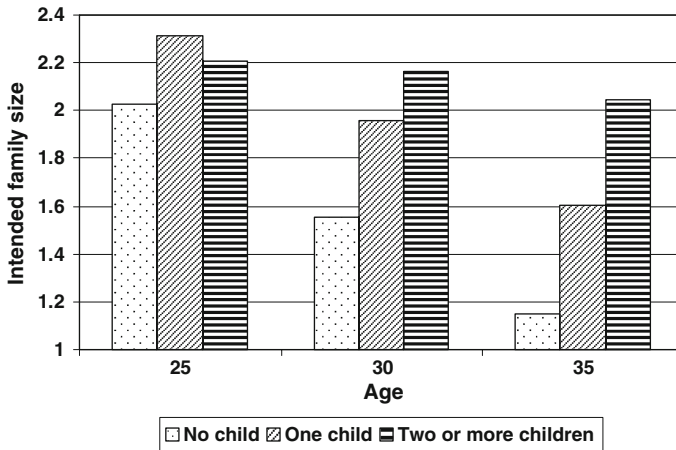
Fig. 5 Family size intentions by age and number of children, based on Model 5 in Table 2

opposite is true for those with lower vocational education. Among these, females have higher intentions than men. At age 35, the picture is quite different. All types of respondents have—on average—lower intended family size than at age 25. However, the mean intended family size of women with a university education has decreased much more sharply than that of all other groups. It is about 0.1 lower than that of respondents with lower vocational education and 0.2 lower than that of male respondents who completed university. Thus, higher educated women seem much more likely to adjust their family size intentions downward than others. Taken together, these results mostly confirm the third hypothesis: women who spend many hours in paid employment and who are highly educated have about the same family size intentions as women who work few hours and who have a low level of education during their twenties, but the former have considerably lower intentions during their thirties. Thus, hypothesis H3a is partly and hypothesis H3b completely confirmed. Comparing the variance in the constant and age term with those of Models 2 and 3 shows that adding information on the educational and occupational career of respondents only slightly increases the explained variance to 8.5% for the mean and to 11.2% for the age slope.

Finally, in Model 5 of Table 2, information on the fertility career itself is added to the equation. In line with expectations, whether or not respondents have one or more children strongly influences their family size intentions. First of all, respondents with two or more children have higher family size intentions than those with one child, and respondents who have no children have by far the lowest intentions. In addition, the statistically significant positive interactions between age and family size imply that these differences widen with increasing age. This is illustrated in Fig. 5, in which the family size intentions of respondents with zero, one and two or more children at ages 25, 30 and 35 are presented.[5] At age 25,

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[5] Again, the time-constant variables in the equation are set equal to their mean value, and the time-varying variables are set to their mean value in the age groups 23–27, 28–32 and 33–37, respectively.

intentions differed relatively little by parity. All types of respondents had a mean intended family size of 2 or higher. By age 35, this picture had changed quite dramatically. For respondents with 2 or more children, the intended family size was still more than two, for respondents with one child it was 1.6, and for respondents with no children it was less than 1.2. These results suggest that respondents with one child and in particular those with no children tend to adjust their family size intentions downward as they grow older. Another noteworthy finding in Model 5 is that the interactions between steady dating and age and between unmarried cohabitation and age become non-significant, and that the interaction between being married and age even becomes negative. If married respondents have children this negative effect is more than offset by the positive interaction effects of having children and age. This is not true for married respondents without children, though. As a result, over time the difference in mean family size intentions between married respondents without children and non-married respondents without children becomes smaller. At age 25, the former had a mean intended family size of 2.23, versus 1.89 for the latter, a difference of more than 0.3 children. By age 35, this difference had disappeared, with cohabiting respondents without children intending to have 1.14 children, versus 1.15 for married respondents without children. In all, these results imply strong confirmation for the last set of hypotheses: The more children young adults have, the higher their family size intentions (H4a) and this effect becomes stronger with increasing age (H4b). A final observation about Model 5 is that this model explains a sizeable proportion of the between-person variance: 30% in the mean, and even 71% in the age slope. Furthermore, the covariance of both estimates is reduced by 74% compared to Model 2.

5 Discussion

Recent years have witnessed a renewed scientific interest in family size intentions and ideals in developed societies which seems to stem at least partially from the idea that realized fertility in these societies is lower than intended fertility. If so, why do people end up having fewer children than originally intended? In this paper, I address the question of the stability of family size intentions. It is quite likely that young adults' subjective ideas about how many children they want may change as a result of their experiences in the family and occupational life domains. If so, this could enhance our understanding of why people end up with less—or occasionally more—children than intended at an early age. To study this issue, I use data from a Dutch panel survey in which respondents are questioned on their family size intentions six times in the course of 18 years.

The results fit in quite nicely with the findings of Quesnel-Vallée and Morgan (2003) for the U.S. that exactly realizing one's intentions is less likely than 'missing the target'. In this study, 42% of the women and 48% of the men aged 26 at the first interview had achieved their intended family size 18 years later. Although this percentage is somewhat higher than that reported by Quesnel-Vallée and Morgan (2003), it is still a minority. Forty-four percent of the women and 37% of the men ended up with fewer children than intended 18 years earlier, and 13% of the women

and 15% of the men with more than intended at age 26. One possible reason why the percentage is somewhat lower in this study is that in the study of Quesnel-Vallée and Morgan (2003), the respondents were between 21 and 25 years of age when their fertility intentions were measured, whereas they were 26 in this study (at least for the cohort for which this comparison is made). Therefore, it could well be that the intentions of respondents in this study have already been 'adjusted' somewhat more to the realities of their life course than in the study by Quesnel-Vallée and Morgan. At the same time, it is interesting to note that in both studies, the percentage of respondents who 'miss the target' is much higher than that in Symeonidou's (2000) study of Greek women between 1983 and 1997. She reports that 70% ended up with the number of children they expected, whereas 19% have fewer and 11% have more. The main reason for this large discrepancy seems to be that Symeonidou restricted her sample to women who were already married at the start of the survey.

Starting from Heckhausen's life-span theory of control (Heckhausen 1999; Heckhausen and Schulz 1995; Wrosch and Heckhausen 2005), I hypothesized (a) that—on average—family size intentions would be adjusted downwards with increasing age, (b) that inter-individual differences in family size intentions would increase with age, (c) that the age pattern of family size intentions would be related to experiences in the family, educational and occupational life domains, and (d) that such experiences would have a particularly strong influence on intentions at later stages of young adulthood. Early during young adulthood, people may evaluate their future as still relatively uncharted and full of opportunities. As their lives unfold, they will find out that some futures become less likely than others and this might lead to a re-evaluation of their intentions. The results of the empirical analyses largely support the hypotheses based on the life-span theory of control.

On average, more respondents ended up with fewer rather than more children than originally intended. This finding is corroborated by the analysis of changes in family size intentions. First of all, I expected that—on average—these intentions would be adjusted downwards. This was indeed the case. But more importantly, the age patterns of family size intentions differed strongly between respondents. At young ages, there was relatively little variation in family size intentions. However, as they grew older, variation increased. Although most people showed a decrease in their family size intentions as they aged, some showed a stable pattern and some even showed an increase. In addition, the analysis showed that both age and cohort affect family size intentions. They become lower with age, but subsequent cohorts also have lower family size intentions. Given that, on average, people with lower intentions end up with lower final fertility, this suggests that—as long as this cohort trend is sustained—actual fertility rates may show a further decline (cf. Lutz et al. 2006). The analysis also shows some fluctuations in family size intentions by survey wave. It is hard, however, to interpret this as a 'genuine' period effect, as the phrasing of the family size intention differed slightly in one of these waves.

The living arrangements of young adults strongly structure their family size intentions. During the early twenties there is little difference between young adults in different living arrangements, but differences strongly increase over time. The family size intentions of married respondents remain quite stable across young adulthood, whereas those of respondents who do not have a partner are the most

likely to fall sharply. This is in line with the expectation that being 'off-time' in the partner career leads to a re-assessment of one's ideas about one's fertility career. A further interesting result is that cohabiting young adults have lower family size intentions than married young adults throughout young adulthood. This suggests that some kind of selection of less child-oriented people into unmarried cohabitation might be operative (cf. Beets et al. 1999).

Experiences in the educational and occupational career also influence the family size intentions of young adults, although to a lesser extent than experiences in the partner career. Whereas students, on average, have the same family size intentions as young adults who are employed, men and women in their thirties who are working relatively many hours seem to adjust their intentions downwards compared to men and women with fewer working hours. This suggests that family size intentions only decrease after one has completed schooling and seriously starts entertaining the idea of having children, and that involvement in a full-time job is particularly likely to lead to downward adjustment. This may be peculiar to the Netherlands with its emphasis on part-time employment. In addition, an important finding is that women with a high level of education are particularly likely to adjust their family size intentions downwards. Between age 25 and age 35, the intentions of women with a university degree fall by about 0.5 children, compared to 0.35 children among men and women with lower vocational training and 0.4 children among men with a university degree. It is tempting to speculate that this large drop among higher educated women is related to the fact that combining a career and children is particularly hard for them.

Finally, changes in the family size intentions of young adults are strongly related to what actually goes on in the fertility career. Again, differences are still relatively small during the early twenties, but the gap widens with age. Particularly men and women who have no children in their thirties substantially lower their family size intentions. It is unclear what exactly causes this downward adjustment, but it seems likely that infecundity and low fecundity play a role. For instance, the reduction in family size intentions is particularly large among the married childless. As married young adults on average have higher intentions than the non-married, this could be attributed to an increasing selection with age of infecund or low fecund men and women into the married childless category.

Overall, these results show that family size intentions are not stable, but are adjusted as people grow older. On average, the adjustment is downwards, but some people do not adjust their intentions or even adjust them upwards. Much of this difference in age patterns can be explained by changes in the partner, educational and occupational careers of young adults. Not finding a—suitable—partner and pursuing a job career—for women—are important factors. Also, the timing of the fertility career itself is of major importance. If respondents postpone having children until their thirties, they are much more likely to adjust their intentions downwards than if they start their childbearing career earlier. Evidently, this study does not give an answer to what causes this postponement and the related downward adjustment. Among the childless, low fecundity and infecundity could play a role. Among respondents with one child, less positive experiences with parenthood could also be a factor. However, additional research is needed to clarify such issues.

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