

Reflecting on major life decisions: Changing your mind and not recalling it

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Abstract

Many important decisions in life require not only knowing today's preferences, but also forming expectations about future preferences and circumstances. This makes it crucial to understand how stable such preferences are as well as how stable people perceive them to be, both in expectation and retrospection. With an application to reproductive intentions and behavior in Kenya, we first show that reproductive intentions are quite unstable: 60% of respondents change their preferred number of children over time horizons of 3 to 9 years, 20% even by 2 children or more. People's perceptions, however, are different: For most hypothetical scenarios, respondents either expect not to change their intentions or to lower them. Despite these expectations, we observe equally many in- and decreases in intentions up to age 28. Even when asked to recall past intentions they are not aware of this instability and report they always wanted as many children as currently. Hence, current preferences seem to strongly guide not only expectations of future preferences, but also recall of past preferences. We hypothesize that motivated reasoning might play a role explaining this pattern.

Keywords: Learning/ Belief, Expectations, Role and Effects of Psychological Factors on Decision Making. Fertility. Family Planning. Health Behavior. Microeconomic Analyses of Economic Development

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1 Introduction

“Life can only be understood backwards; but it must be lived forwards.” Søren Kierkegaard

As Kierkegaard points out, many important decisions in life require forming expectations about the future, its circumstances and one’s own future preferences. For many decisions, we have to take into account whether certain things would also please our future selves: we decide to pursue a Ph.D., because academic life appeals to our current self and we believe our future selves would also enjoy the life as a professor. We may decide to have many children, because we think we will enjoy having a big family; or we decide to have no children, because we currently don’t particularly like babies and cannot image we would ever want to have grand-children once we’re older. Kierkegaard’s quote touches upon a central aspect of human life and decision-making: we have to make decisions that might affect our whole life without necessarily knowing much about our future preferences. This begs several questions: how do people make central decisions in life? How strong and stable are their intentions and the preferences behind these intentions? How stable do people expect their preferences to be and how do people learn about the stability or instability of preferences?

Using a rich long-running panel from Kenya with up to 9 years of information on respondents’ fertility preferences and outcomes, we apply these questions to reproductive intentions and decisions. Reproductive decisions are major life choices with important individual, societal and macroeconomic consequences. Moreover, reproductive choices are formed and made over many years and once taken, irreversible; this is especially true in the context of rural Kenya with relatively low levels of abortion and moderate levels of contraceptive use, and thus imperfect control over one’s overall realized fertility.¹ Having correct expectations about

¹According to Askew, Maggwa and Obare (2017), the unwanted fertility rate in rural Kenya was at 2.1 in 1993, declined and stayed stable at 1.4-1.5 over the next decade before declining further by 2014. Accordingly, 36% of births in Kenya are reported to be unintended, i.e. either mistimed or unwanted. The contraceptive prevalence rate (CPR) in rural Kenya was up from 37% in 2003 to 56% in 2014, but the modern CPR for the poorest quintile at only 29%. For women aged 15 to 19, the CPR was up to 40%. According to our own data, the CPR in the first survey round was at 15.1% for the young women, reaching 67.5% by the third survey round (who use the pill, injectibles or condoms). According to the

one's preferences given different future circumstances is therefore of particular importance in this context. For example, if one currently wants 6 children, but only 3 in case one's finances worsen significantly, having more than 3 children early on might prove costly if there is a high chance finances do indeed worsen.²

By answering the questions raised above applied to reproductive decision-making we make several contributions to the literature. First, we show that even in the context of such an important life domain as reproduction, intentions, represented by the number of children desired, vary a lot: Over time horizons of 3 to 9 years, 60% of respondents change their preferred number of children, 20% even by 2 or more children. Hence, preferences can be quite unstable, even for major life decisions such as having children. Despite these common changes, we find that intentions are informative about subsequent reproductive behavior.

With respect to such considerable change in preferences, Gilbert (2009) points out that people are not easily able to correctly forecast their future preferences. In Economics, the literature on projection bias (Loewenstein, O'Donoghue and Rabin (2003)) puts forward that people overestimate how closely future preferences (in different states) resemble their current preferences.³ Our second contribution is therefore to provide suggestive empirical evidence from an application to Kenyans' reproductive intentions and behavior that projection bias might also apply to some of the most important decisions in life: whatever circumstances they might expect, respondents do not really expect to increase the number of children they want. For many hypothetical scenarios, a majority of respondents do not expect to change

definition used by Askew, Maggwa and Obare (2017), two thirds of births by the women interviewed for the fertility module of round 1 were unintended, with the overwhelming majority of them being mistimed rather than unwanted. Of the same women, only 34% think the birth was also unintended by the father, implying a sizeable gap. By survey round 2, 62 out of 5,000 reported pregnancies were reported to have resulted in an abortion (1.24%), compared to 186 abortions per 1,000 live births in the US in 2014 (see https://www.cdc.gov/reproductivehealth/data_stats/index.htm).

²On the flip side, if one currently does not desire any children at all, but anticipates an 80% chance to want children in the future, deciding not to have any children might turn out to be a mistake regretted by your future self.

³Empirical evidence has been found in mis-predicting the endowment effect (Van Boven, Dunning and Loewenstein (2000)), ordering winter clothing on cold days (Conlin, O'Donoghue and Vogelsang (2007)), buying convertibles or houses with swimming pools on hot days (Busse et al. (2015)), the decision which college to attend (Simonsohn (2010)) or the demand for health insurance (Chang, Huang and Wang (2016)).

the number of desired children at all. For the scenarios for which they do expect to update intentions, their expected reaction is asymmetric: they expect to lower intentions following negative scenarios such as worsening finances, but not to increase them following positive scenarios such as improving finances. This is in line with 75% of the young women rather wanting one child less than more (relative to their preferred number). We therefore interpret the reported desired number of children as being an upper bound for an ideal scenario for most respondents. Observing respondents increasing intentions or having more children than initially desired can thus be seen as a sign of either unexpected preference changes or unexpected children.

As pessimistic as Kierkegaard appears about the challenges of living life forwards he seems to be optimistic about understanding life backwards. Are people always aware of how they changed their preferences over time or why they made certain decisions in the past? Retrospection can have its challenges, too. Our third contribution is therefore to show that even in hindsight, many people are not aware of the instability of their preferences. When asked to recall how many children they wanted 3 years ago, most respondents say they always wanted as many children as they currently want. If we want people to learn about the instability of intentions or the extent of their projection bias, a necessary condition would be that they are able to recall or reconstruct their past intentions. In contrast, we find that most respondents fail to correctly recall their past intentions, which limits the lessons they could learn from their experiences, such as life being quite variable and indeterminate at times. Instead, they believe they haven't changed intentions, which is particularly true for those who increased intentions. A higher share of those who now want more children than before think they had stable intentions than of those who actually had stable intentions. Ex-post rationalization resulting from motivated reasoning might explain these patterns, psychological reasons to ex-post rationalize could for example be to maintain a self-image of being in control of one's own life or not wanting to be cruel towards one's "unwanted" children. We thus add to the growing literature on motivated reasoning which is summarized

in Bénabou and Tirole (2016). Empirical studies have mostly focused on lab experiments (such as Eil and Rao (2011) or Mobius et al. (2011) on updating beliefs about one’s IQ scores), with older studies in psychology and politics also studying changes and recall of political attitudes (see Markus (1986) for example), but there is a dearth of long term studies in field settings. In contrast to most studies in this literature, we study a long-term application of a very relevant domain in life, situated in a field setting in a developing country, in which respondents start with certain intentions and have at least some control over the outcomes. The ability to track these respondents over such a long time and from intentions to outcomes, in addition to being able to compare recalled against actual past intentions, mark the unique features of our study. Incorrect recall - possibly due to psychological motivations - in this context might result in insufficient learning about the instability of intentions, which might matter in various ways: first, it can lead individuals to underestimate the variability of intentions as well as the uncertainty of future tastes. This in turn might make individuals too likely to act on current intentions and too unlikely to take sufficient precautions against changes in future preferences not appreciated by the current self. Moreover, it might also lead to overestimating the precision of one’s current predictions. Furthermore, inaccurate beliefs could be passed on to children, who could repeat any mistakes their parents had made. As such, this could be one explanation for “imperfect empathy” towards one’s children as put forward in Bisin and Verdier (2001). Second, motivated reasoning and ex-post rationalization could have societal consequences by affecting social norms or beliefs. Ex-post rationalizing one’s many children as always desired could contribute to maintaining norms of high fertility. In politics, forgetting about how one changed preferences for redistribution and fairness since going from rags to riches, also lowers the potential for any change coming from those who rise from poverty to influential positions.⁴ Third, imperfect recall and biased retrospection could have direct consequences for the design of policies and institutions and the support for them. In this particular context, biased retrospection might undermine the support for family

⁴For an example of one’s luck in life affecting one’s views, see Di Tella, Galiati and Schargrodsky (2007) who find that Buenos Aires squatters who were lucky to obtain land titles hold more individualistic beliefs.

planning programs: telling themselves they always wanted so many children, those who did have more children than initially planned might neither see the need for family planning interventions nor support them, although their experience could tell them otherwise - if only they were aware. Those who lowered intentions are more often aware of what happened, but might not see the need for such programs either. Principals using introspection for the design of policies or institutions might therefore end up with suboptimal designs. Finally, such changing preferences beg the question which preferences (initial or final ones) matter for individual life satisfaction and should be considered for any welfare judgements.

Our final contributions are specific to the context of fertility. First, we add to research on reproductive intentions that suggest they are predictive of behavior, but not always completely stable.⁵ Most of these studies focus on the extensive margin of wanting an additional child or not and therefore might miss considerable changes in the intensive margin. Furthermore, we are the first to ask as how stable people perceive their reproductive intentions. Second, the results are relevant to family planning interventions and the question of their effectiveness. Reviews by Miller and Babiartz (2016) and Mwaikambo et al. (2011) find quite varied effects of family planning programs, ranging from 5 to 35% fewer children being born and 5 to 7% longer birth intervals. Our results suggest that reproductive intentions vary over time and hence are not set in stone and potentially alterable. Finally, we raise some methodological points: we show that the extent of ex-post rationalization in retrospective questions is potentially higher than hitherto believed in the literature, or more wide-spread than one could take away from Pritchett (1994). Moreover, given the frequent changes in desires we show that the measure of excess fertility strongly depends on which reproductive intentions one uses as a benchmark. Decomposing fertility into wanted and unwanted fertility to analyze which of the two is driving overall fertility might therefore obscure the fuzziness of the distinction between these two concepts and divert the focus away from important other

⁵Findings from OECD-countries for example come from Westoff and Ryder (1977), Rocca et al. (2010) or Iacovou and Tavares (2011)) and for non-OECD countries from Campbell and Campbell (1997), Nair and Chow (1980), Tan and Tey (1994), Roy et al. (2008) in India, De Silva (1992), Vlassoff (1990), Bankole and Westoff (1998), Debpuur and Bawah (2002) and Curtis and Westoff (1996).

factors driving both overall fertility and desires.

The remainder of this paper is organized as follows: We first introduce the data and context in section 2 before examining reproductive intentions and expectations in sections 3 and 4. Following, we analyze how much intentions change and whether respondents are aware of any changes, in sections 5 and 6. Finally, we conclude.

2 Data and Background

We make use of the Kenyan Life Panel Survey (KLPS), which is a longitudinal dataset covering over 5,000 young people from the Busia District in rural western Kenya. Starting in 2003, a representative sample of the children initially part of a deworming program (see Miguel and Kremer (2004)) was chosen to form the sample for a long-time panel survey, with survey rounds so far in 2003-05, 2007-09 and 2011-2014 (see figure A.1). Although basic demographic questions about marriage and fertility were asked to all respondents, in round 1 the most detailed questions regarding reproductive intentions were posed only to a representative sample of 355 young women. 239 of them were interviewed for all rounds 1 to 3. Most of the analyses will rely on this subset of women (call this “sample 1”), since for them we have both detailed questions about reproductive intentions and expectations from round 1 and can thus compare recall in round 2 to their actual intentions in round 1. Sample 2 (see figure A.1) of respondents interviewed for both round 2 and 3 comprises 4,194 individuals and will be used for some supplementary analyses mentioned in the main text.

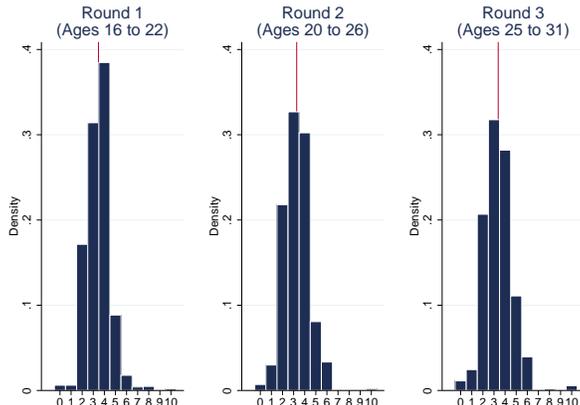
Throughout the paper, (reproductive) intentions are indicated by the answer to the following question: “Today, if you could choose exactly, how many children in total would you like yourself or your partner to give birth to (including those who have already been born)?” As figure A.1 shows, respondents were interviewed roughly every 4 to 5 years, starting at an age of ca. 19. By the point of round 3, almost all women (92%) have been pregnant at least once, at the point of their first pregnancy they were slightly younger than 20 years.

The number of children desired fell from 3.63 on average to 3.27 between round 1 and 2 and to 3.35 at round 3. The number of desired children in our sample is very much in line with data from the rest of Kenya as presented in Askew, Maggwa and Obare (2017): The wanted fertility rate in rural Kenya declined from 3.9 in 2003 to 3.4 in 2014, in our sample it ranges between 3.3 and 3.6 across survey rounds. The total fertility rate for whole Kenya was at 3.9 in 2014, with 3.1 in urban areas and 4.5 in rural areas, the unwanted fertility rate has declined from 2.0 in 1993 to 0.9 in 2014.

3 Fertility Intentions

Looking at figure 1, panel a, almost all respondents desire between zero and six children. Most women want either 3 or 4 children, although the share of those wanting 4 decreases from almost 40% at age of 19 to less than 30% by age 28. The share of those wanting 2 or fewer children is the lowest at a young age, lower than 20%. At higher ages, however, this share goes up to almost 25%. The share of those wanting 5 children or more is also increasing across ages. Despite these changes, in aggregate the distribution of children desired appears to be quite stable: there are some changes in the frequency of answers, but they are relatively minor (especially between round 2 and 3) and the mean stays relatively unchanged. The same is true when looking at average intentions across ages in survey rounds 2 and 3: Figure 2 shows that women fluctuate between wanting 3 to 3.5 children across ages, with a slight upward trend towards 3.5 children for women reaching their late 20s. Men fluctuate between desires of 3.3 to 3.5 children on average, with a slight upward trend for those closer to 30 wanting more than 3.5 children on average. The figure also shows that women start having children earlier than men, who appear to catch up in their late 20s.

(a) Number of Children desired



(b) Change in the Number of Children desired

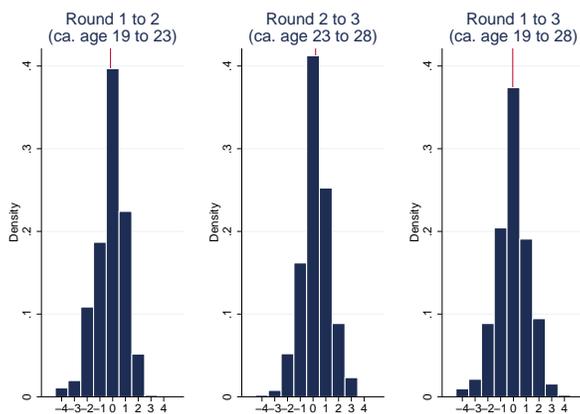


Figure 1: Distribution of the desired number of children and changes in these desires between survey rounds.

Notes: Both figures are based on the 239 women interviewed for the extended fertility module of survey round 1, round 2 and 3. Observations are weighted by the intensive tracking rate adjusted weights for each round (which is the later survey round for the changes). Panel b plots changes in intentions between survey round 1 and 2, survey round 2 and 3 and from survey round 1 to 3, i.e. for example “intentions round 3 - intentions round 1”. The lines denote the average desires in panel a and the average change in panel b.

The distribution of intentions appears to be pretty stable over time and across ages. Moreover, these intentions do translate into behavior as table 1 suggests, thus confirming previous findings in the literature: Higher intentions at round 1 are associated with more children born subsequently. This is true for both, the sample of all women and those who had not been pregnant yet at round 1. For them, wanting one more child at round 1 is associated with having 0.33 children more on average by round 3.

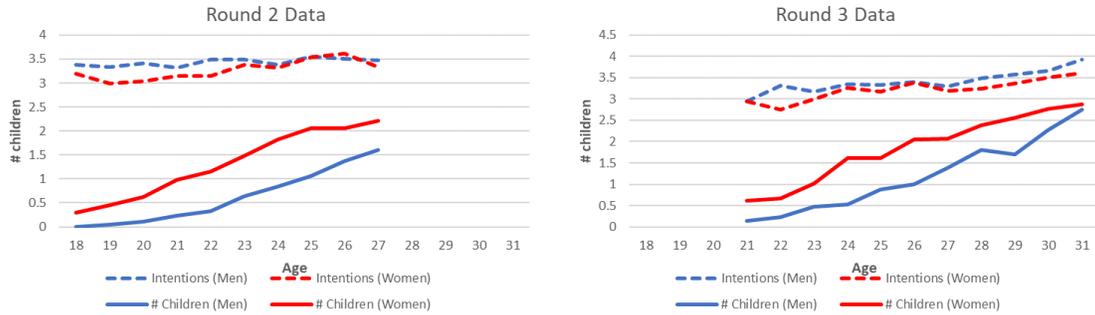


Figure 2: Evolution across ages: round 2 (left panel) and round 3 (right panel)

Notes: The figure makes use of the full survey rounds 2 and 3, i.e. sample 2. Both panels display weighted averages of desired children and number of living children conditional on age, where the weights are adjusted for the intensive tracking rate. The left panel utilizes information from round 2, covering ages 18 to 27. The right panel uses data from survey round 3, covering ages 21 to 31. For each combination of gender and age there are at least 50 observations. Individuals answering “don’t know” or “as many as possible” for their desired children are excluded.

Sample	<i>Dep. Var.:</i> Number of Subsequent Children at			
	Round 2	Round 3	Round 2	Round 3
	All Women		Never Pregnant	
Intentions at Round 1	0.165** (0.0746)	0.294*** (0.0666)	0.159** (0.0761)	0.330*** (0.1049)
Constant	0.494* (0.254)	0.806*** (0.237)	0.219 (0.267)	0.562 (0.394)
N	236	236	121	121
R ²	0.0396	0.0724	0.0342	0.0782

Notes: “Number of Subsequent Children” denotes the number of children born after the first survey round. Each cell represents a separate regression. Regressions include no additional controls. Standard errors are clustered at the baseline school level and in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Tracking rate adjusted observation weights are used.

Table 1: Reproductive intentions & reproductive outcomes

4 Expectations

Table 1 suggests that reproductive intentions contain predictive power - people seem to act on their intentions at least to some extent. For this reason, it is relevant how stable these intentions are and how stable people perceive them to be. If they are not very stable, should you act upon currently high intentions? Or would it be better to wait a few months and see whether you still want as many children? Moreover, how independent are intentions of circumstances? For example, do women and men want 4 children, no matter whether all their desired children are sons or daughters, independent of whether they migrate, how their finances develop, how well they get along with their spouse or how difficult the pregnancies are? In order to gauge their expectations of how to adjust to different circumstances, we presented a subset of women in round 1 with different hypothetical scenarios.

If they were forced to choose between having one child more or less than their preferred number, 75% of women around age 19 said they would rather want one child less. This is in line with their answers to different hypothetical scenarios, for which we asked the following question: “In each situation, would you like to bear the same number of children, or a larger or smaller number?” For most scenarios (all of them are shown in appendix, figure A.2), the women said they would either want the same or a lower number of children. Figure 3 illustrates that the only scenarios, for which at least 10% of women would like to have more children are improving finances, when all desired children are either daughters or sons or the husband wants more children (or if a child dies in infancy). In comparison, for the case of worsening finances, almost 60% of respondents would want to have fewer children. Even higher shares of women would like to have fewer children in case they no longer get along with their spouse or if the pregnancies are difficult. The pattern found in figure 3 suggests that respondents expect to respond asymmetrically to scenarios: not to update intentions for positive scenarios, but to lower intentions for negative scenarios. Together with the overwhelming majority of women choosing rather one child less than more, we take this as evidence that the number of desired children can be seen as an upper bound of their

desired children that applies to an ideal scenario. Having more children than initially desired can thus be seen as a sign of either unexpected children or unexpected changes in intentions for the majority of respondents. Given that respondents either do not expect to change intentions much or to lower them, how stable are these intentions?

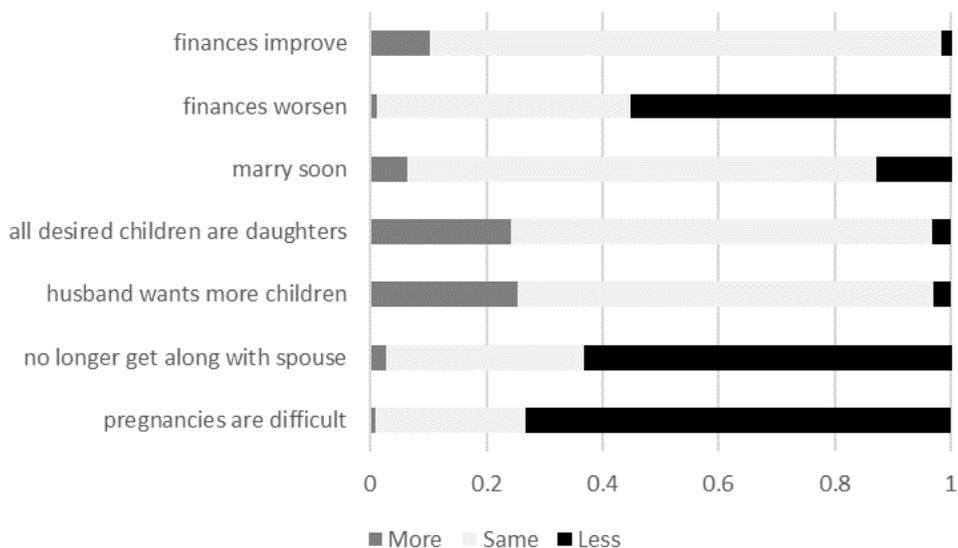


Figure 3: Expectations for different scenarios: “In each situation, would you like to bear the same number of children, or a larger or smaller number?”

Notes: This question was only asked in the fertility sub-module of round 1. Hence, the data is based on the answers of 351 women (and for those questions only applying to unmarried women on answers of 239 unmarried women). Observation weights are adjusted to account for the intensive tracking rate for this module. “Dont’ know” answers are excluded.

5 Changes in Intentions

Not very stable, as figure 1, panel b proves. Between each survey round, 60% of women change the number of children they would like to have, roughly 20% even change them by 2 or more children.⁶ This can be quite consequential: By age 28, 15% of women in sample 1 have more children than initially desired, 36% have at least as many children as they initially desired (see figure A.3). Some of these children seem to come unexpected: When asked in

⁶These patterns are very similar for sample 2 and are almost identical for men and women.

survey round 1 whether they expect to have a child in the next two years, only 23% say yes, and only 60% expect to have a child in the next five years. However, 35% do have a child in the next two years and 64% in the next five years. Among those who did not expect to have a child in the next 2 years, 26% end up having a child in the next two years (compared to 67% among those who did expect one). 52% of those who did not expect one do have a child within 5 years, whereas 72% of those who expected to have one end up having one. This pattern suggests that unexpected changes in reproductive intentions and/or outcomes are very common, even for relatively short time horizons of 2 to 5 years.⁷

While it is not the focus of this paper, there are some identifiable reasons why these intentions change. Migrating to a city for example is associated with lowering the number of children desired and with having fewer children. Other potential reasons are getting married and negotiating with one's spouse, or gender realizations of one's children. On the other hand, we also observe that those who have additional children increase the number of children they state is optimal.⁸ Our results (based on the full sample 2, but not reported here) show that having an additional child between round 2 and 3 is on average associated with wanting 0.23 children more in round 3 compared to round 2. Overall, we can conclude that changes in reproductive intentions are the norm rather than an exception.

⁷This is not due to respondents having unclear expectations: Less than 3% of respondents answer with "it depends" or "don't know" to their expectations for the next 2 years, less than 5% do so when asked about the next 5 years.

⁸An alternative explanation is that respondents very quickly act on increased intentions

6 Recall

Given that changing intentions is the norm, are people able to easily recall such changes?⁹ Figure 4 gives a clear answer: No. Overwhelmingly, almost 80% of the women say they always wanted as many children as they currently desire.¹⁰ As a result, most respondents do not recall to have changed their intentions at all, as the left panel in figure 4 illustrates. Interestingly, this is in particular true for those women who increased their intentions between the two survey rounds. A staggering 91% of them are convinced they have not changed their intentions, whereas only 74% of those who actually had stable intentions are convinced they have not changed intentions. The consequence of this can be seen in the right panel of figure 4: Plotting the “recall mistake”, i.e. the difference between the recall of past intentions against the actual past intentions, almost none of the women who increased their intentions correctly recall their past intentions (only 3.2%). For the women who lowered their intentions, this share is at least at 12.3%. The difference between those who increased and decreased their intentions is significant at the 10% level, as the first two columns of table A.1 show. This pattern is even more pronounced when comparing whether respondents at least correctly recall the direction into which they changed intentions, not necessarily requiring they get their past intentions completely right. While at least 26% of women who lowered their intentions think they lowered their intentions, only 7% of those who increased intentions believe they have increased intentions over the past years, see columns 3 and 4 of table A.1.

⁹When talking about recall, we mean the answer to the following question asked in round 2: “If I had asked you the same question 3 years ago, how many children in total would you have said you would like you or your partner to give birth to (including those who had already been born)?” Note that not all residents were exactly interviewed 3 years after their interview for round 1. The patterns are the same for those who were interviewed 4 or 5 years after their round 1 interview, which we take as evidence that this imprecision is not driving the results we find. The results are neither driven by individuals who were interviewed 4 or 5 years later and had an additional child within 1 or 2 years respectively that made them surpass or reach the number of desired children at survey round 2, which probably would have implied increased desires 3 years ago that they would now correctly recall. Among those who increased intentions and were interviewed 4 or 5 years after round 1, none surpassed their desired number of children within 2 years. Excluding the 3 individuals who reached their desired number of children within 2 years of the round 1 interview and were interviewed 4 or 5 years after their first interview delivers the same patterns.

¹⁰This is also true for the whole sample. While we cannot compare their recalled intentions to their actual past intentions, we can plot the recalled change in intentions. The pattern is the same as for the subset of women interviewed in detail in round 1.

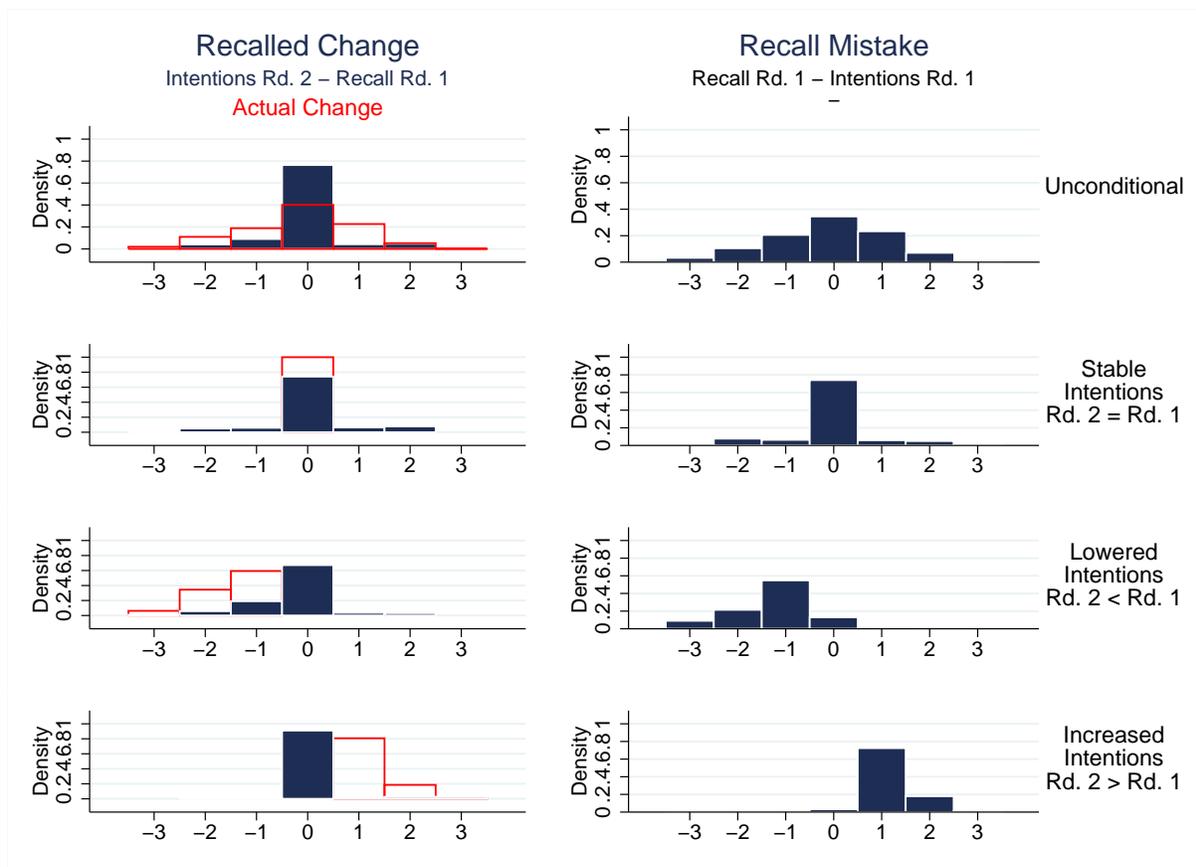


Figure 4: Recall patterns: Recalled Change (left panel) and Recall Mistake (right panel).

Notes: Based on those 273 women interviewed for both, survey round 2 and the fertility module of round 1, this figure plots three things: In the left panel, the “recalled change”, i.e. intentions in round 2 minus the recalled intentions in round 1, against the actual change or intentions in round 2 minus actual intentions in round 1 (in red). The right panel plots the “recall mistake”, taking the recalled intentions for round 1 and subtracting the true intentions in round 1. A value of 1 therefore means that an individual overestimates past intentions by 1. Instead of correctly recalling they wanted 3 children they would for example say 4. The upper panel plots is for the whole sample of 273 women. The second row applies to those who did not change intentions. The third panel is for those who lowered intentions, whereas the bottom row shows the distributions for those who increased intentions. Observation weights are adjusted for the intensive tracking rate in round 2.

Two patterns stand out: overall recall performance is very poor, mostly because respondents think they had the same intentions as they currently have, and women who lowered their intentions are significantly more likely to recall having lowered intentions than those who increased intentions recalling having done so. What might be the reasons behind these findings? Maybe our current feelings and perceptions do not only exert an undue influence when trying to predict our future preferences (as in projection bias), but also when trying to reconstruct our past preferences. Such a “retrospection bias” would mean that we not only struggle to image we will have quite different preferences in the future, but also to recall we used to hold quite different preferences in the past. This, in turn, would strongly diminish the possibility of learning about changes in preferences, whether they are endogenous or exogenous. This could have negative impacts on intergenerational learning, “empathy” towards one’s children and on social norms and policies whose design and support is based on retrospection. Finally, the particularly bad recall performance by those who increased their intentions suggests that psychological concerns might be driving these patterns. Potential motivations behind motivated reasoning could be desires to have consistent intentions, to be in charge of your own life, to not having given in to one’s spouse’s demands or to not be cruel toward “unwanted” children. These patterns in turn could lead to ex-post rationalization, which is most powerful for those who increase their intentions (and potentially have or are likely to have more children than initially desired). A cognitive-dissonance type story would work similarly. At this point and without further evidence, these hypotheses are speculative, but we hope to shed more light on them in the future. What is true in the data is that having at least one additional child between survey rounds is associated with a significant increase in the overall number of children desired; having an additional child between survey rounds 2 and 3 is on average associated with increasing intentions by 0.24 children, significant at the 1% level. This pattern is robust to controlling for individual characteristics and other important changes between survey rounds and is most pronounced for married women and men, for whom the coefficient ranges between 0.710 and 0.256 respectively. It seems to be

driven by those individuals who surpass the number of initially desired children and would thus be mechanical if one includes one's current children in the number of ideally desired children. The pattern could also be explained by people deciding to want more children than before, although this would raise the question why admitting so should pose problems.¹¹

In terms of methodology, our findings of imperfect recall and anchoring of recalled intentions at current intentions recommend one should apply caution when eliciting and using retrospective measures of past intentions such as used in DHS-surveys.¹² For example, Pritchett (1994) provides cross-country evidence that differences in fertility desires as opposed to family planning are behind national differences in fertility rates and as such fertility differences are driven by desired and not by unwanted fertility. To do so, he attempts to rule out undue influence of ex-post rationalization on measures of average national fertility desires. His conclusion is that ex-post rationalization should not be a major concern for his cross-country analyses. Note, however, that this conclusion applies to national averages in fertility desires and does not warrant the conclusion that ex-post rationalization is not a major concern at the individual level. Our results suggest that such ex-post measures track current preferences (and thus realizations) too closely. Moreover, figure A.3 plots excess fertility by survey round 3 as evaluated against reproductive intentions in round 1, 2 and 3. Judging against intentions at survey round 1, around 15% of women have unwanted children, and quite a few have 2 children more than initially desired. Compared to intentions at round 2, however, almost none of the women have more than one unwanted child. When using current intentions from round 3, excess fertility all but disappears. Moreover, from our results on recalled intentions in round 2 we know that the majority of respondents sets recalled equal to current intentions, in particular those that actually increased their intentions. Judging excess fertility by round 2 against intentions in round 1 results in 7.7% of the women having

¹¹These results are based on the full sample of respondents interviewed for both round 2 and round 3. They are not reported here, but available upon request.

¹²One question commonly asked in DHS-modules goes the following: "So, with all your experience now, if you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?"

more children than initially desired. When judging against intentions in round 2, this share drops to 1.6% and is only slightly higher at 2.6% when using women's recalled intentions. Taking contemporaneous intentions from round 3 as used in figure A.3 as an indicator for recalled intentions should thus be a warning that we might miss a significant share of excess fertility as judged by true past intentions when we use retrospective measures instead of true past intentions. Hence, when using contemporaneous intentions or recalled past intentions to analyze whether fertility is driven by desired or unwanted fertility one would therefore conclude that unwanted fertility plays no role, a conclusion not warranted when using true past intentions instead. Hence, one should be careful in defining excess fertility and by comparison to which intentions children are unwanted. Fertility desires are important, however, this paper has shown that they are not fixed and one has to be careful when talking about unwantedness. People show significant changes and adjustments of reproductive intentions, potentially also ex-post rationalization, already by age 28.

7 Conclusion

In this paper, we have shown that intentions and preferences behind major life decisions can be quite variable and fluctuating over time, without people being aware of it, not even for such an important and salient life domain as reproduction. Not only expectations can be off, more surprisingly, even retrospection can be inaccurate. We hypothesized that psychological reasons might cause people to give up accurate beliefs in order for desirable ones such as being in charge of their own lives. To some extent, people seem to infer beliefs about past intentions and desires from outcomes, past actions and their current state, not from actual introspection, thus neglecting past desires at odds with their current desires. This limits the lessons we can expect people to learn from experience, which could convey a wrong impression of stable and strong intentions, affecting people's forecasting of future preferences and thus decision-making. Moreover, it could affect societal beliefs and social

norms by making “more experienced” people mistake realizations or current desires as having been desirable all along - once old or rich, you forget about and/or discount the views of your young and poor self. This, in turn, could limit the scope of intergenerational learning and impact the design and persistence of institutions or policies whose creation and support depend on retrospection, affecting the allocation and distribution of individual and societal resources. Better understanding the impacts of incorrect recall on beliefs affecting social norms and policy support as well as the exact reasons behind this poor reconstruction of past intentions and the potential motivations behind it is therefore of interest not only from a purely psychological point of view, but relevant for society as a whole.

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Appendix

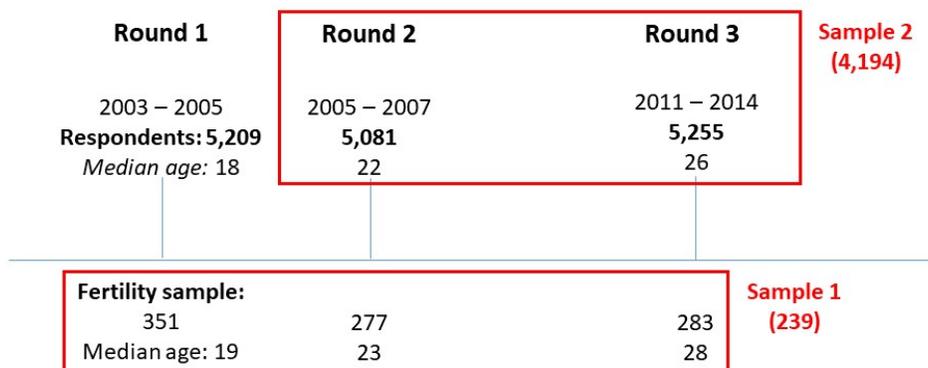


Figure A.1: Survey Structure

	Precise Recall		Recall Direction	
	Linear	Probit	Linear	Probit
Changed Intentions (Round 1 to 2)	-0.662*** (0.059)	-0.749*** (0.063)	-0.613*** (0.069)	-0.668*** (0.051)
Lowered intentions (Round 1 to 2)	0.104* (0.061)	0.216* (0.115)	0.159** (0.076)	0.253** (0.107)
Correct recall (if stable intentions)	0.703			
N	273	273	273	273
R ²	0.346	0.452	0.365	0.307

Notes: Precise Recall is an indicator for correctly recalling one's past intentions exactly. Recall Direction indicates whether respondents correctly recall the direction of the change in intentions. Controls include the number of months between surveys, age, controls for respondents' and their parents' education, the number of siblings, marriage and pregnancy indicators as well as changes in these domains between the survey rounds. Standard errors in parentheses are clustered at the baseline-school level with * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Tracking rate adjusted observation weights are used. For Probit regressions, marginal effects at the variable's mean are reported (or going from 0 to 1 for dummies).

Table A.1: Regressions for Dependent Variables: Recall measures at Round 2

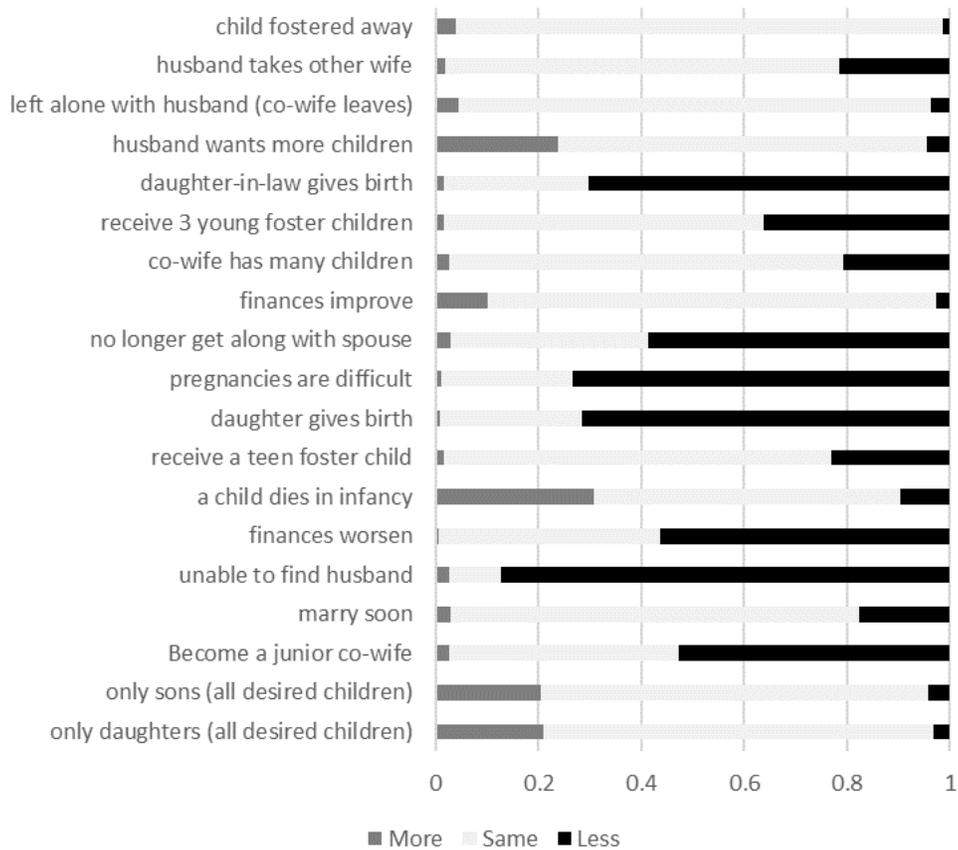


Figure A.2: Expectations for different scenarios: “In each situation, would you like to bear the same number of children, or a larger or smaller number?”

Notes: This question, on which this data is based, was only asked in the fertility sub-module of round 1 and is hence based on the answers of 351 women (and for those only applying to single women to 239 women). Observations weighted are adjusted to account for the intensive tracking rate for this module. “Dont’ know” answers are excluded.

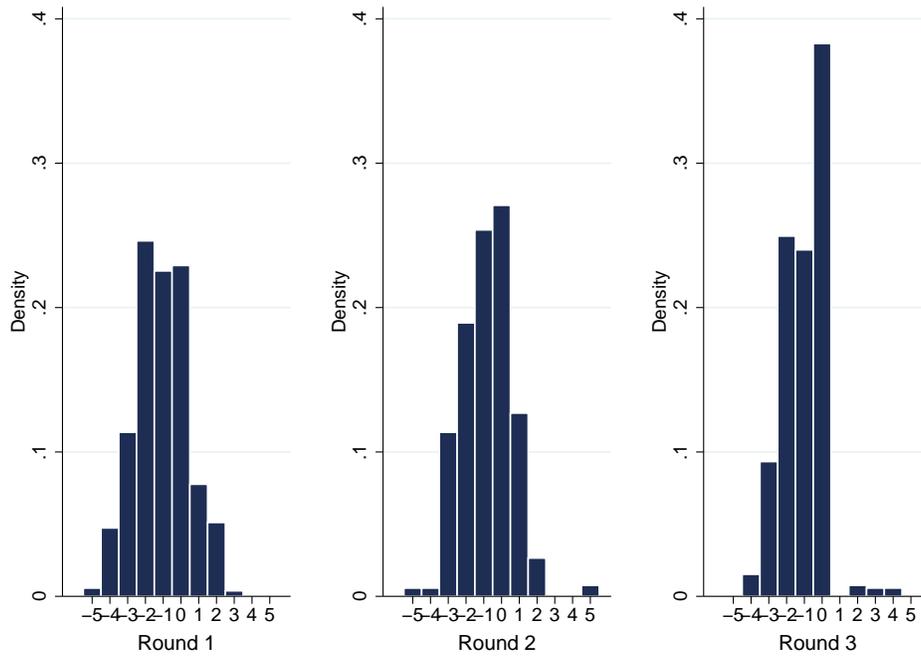


Figure A.3: Excess Fertility by Round 3 as judged by using Desired Number of Children at Round 1, 2 or 3: Number of Living Children minus Number of Desired Children at specified survey round

Notes: This figure is based on the 239 women in sample 1, with observation weights adjusted for the intensive tracking rate.