Do preceding questions influence the reporting of childbearing intentions in social surveys?

For demographers, fertility intentions are a long-standing source of interest. They have the potential to explain past fertility and to predict future fertility. However, the reliability and validity of such measures, and thus their utility, has for equally long been met with scepticism (Westoff, Mishler et al. 1957). This is because such attitudes do not wholly predict future fertility and are often revised as individuals age and their circumstances change. The aim of this paper is underline the need for careful interpretation of fertility preference measures collected as part of multi-purpose social surveys. Here we examine a new reason for caution: simply changing the point at which fertility preference questions are asked in a questionnaire can significantly affect the responses. We will illustrate this effect using the results of a series of preceding-question context effect experiments.

The earliest fertility preference survey item that we have found was from a 1936 US Gallup survey which asked respondents *'what do you think is the ideal number of children for a family to have?'* (Mindick 1977) and questions on fertility preferences continue to be asked in many large, representative and multipurpose surveys. In the UK, for example, fertility intentions questions have been asked in the General Household Survey (GHS), the British Household Panel Study (BHPS), the National Child Development Study (NCDS), the British Cohort Study (BCS), and the Millennium Cohort Study (MCS). Notable international examples include the European Social Survey (ESS), the Eurobarometer survey, the American National Longitudinal Surveys (NLS), the Household, Income and Labour Dynamics in Australia survey (HILDA) and the Demographic and Health Survey (DHS) series. Details of these questions are given in Table 1.

Why are fertility intentions important?

There are many reasons why demographers are interested in fertility intentions. First, they are necessary for our understanding of fertility processes. Many fertility theories assume that changes in fertility demand drive changes in actual fertility: notable examples include (Becker 1960; Caldwell 1976; Turke 1989). It is well noted that attitudes influence, though do not wholly determine, many behaviours (Ajzen 1991). Fertility intentions have been shown to be significant predictors of future reproduction at both the aggregate (Westoff 1990; Pritchett 1994) and individual level (Freedman, Hermalin et al. 1975) (Schoen, Astone et al. 1999) (Berrington 2004) (Testa and Toulemon 2006). More abstract Value of Children measures, such as the extent of agreement with the statement 'Children make life more exciting and fun', have also been shown to correlate with parity progressions (Nauck 2007).

Secondly, because they predict behaviour, fertility intentions can be used in fertility forecasting. Attempts to incorporate fertility desires and expectations into demographic projections go back many years (Whelpton and Freedman 1956) and, as fertility assumptions in population projections are regularly inaccurate, (Shaw 2007) (Jefferies 2008) more attention could be paid to changing fertility intentions. Fertility intentions have not been formally included within official population projection models for the UK; however, fertility intentions as reported in the General Household Survey are considered by officials at the Office of National Statistics as part of the evidence base for the fertility assumptions used in national population projections (Jefferies 2008). Fertility intentions have also been used in forecasts for other EU countries (Van Hoorn and Keilman 1996) and the US (Hollmann et al 2000).

Why are fertility preference measures problematic?

Unfortunately there are severe difficulties inherent in the successful measurement and interpretation of fertility preferences. Demographers traditionally have focused on two events, birth and death. Both of these events can be relatively easily conceptualised, recorded / recalled, and quantified (Morgan and Hagewen 2005). Attitudinal measures, including fertility preferences, fundamentally

do not share these qualities. They are less conceptually and methodologically straightforward. A significant problem measuring and analysing fertility preferences is that they encompass numerous dimensions.

The first distinction, and probably the most important, is between expectations and ideals: the number of children an individual expects to have may not be the same as the number of children that individual would ideally like to have, given no constraints. (Morgan and Hagewen 2005) argue that a great deal of analysis has failed to adequately differentiate between desired and expected fertility. Childbearing can occur with any combination of aspiration and anticipation and an individual's capacity to control reproduction is limited by both social and biological factors. So a birth or a pregnancy can be 'unwanted' but still 'likely', or can be 'desired' but 'a surprise' (Santelli, Rochat et al. 2003). A second division is between the total number of children expected/desired and parity specific measures, i.e. questions that ask whether respondents want or expect 'a(nother) child.' A third distinct dimension is between the above measures and attitudes towards the timing of children, so a birth could be 'mistimed' rather than wholly 'unwanted' (Trussell, Vaughan et al. 1999). Fourth, some surveys include more indirect questions on the Value of Children (VOC): Hoffman and Hoffman (1973), Nauck and Klaus, (2007); these are primarily questions on the costs and benefits of having children. It is also worth noting that all these items can be measured prospectively or retrospectively, methods of data collection which may produce different results.

Our main concern is that most measures fail to take into account fully the uncertainty and context-dependent nature of fertility decision-making. It is well-established in opinion polling methodology that capturing the level of certainty / intensity with which an opinion is held is vitally important (Likert 1932) (Katz 1944). Likert questions allow many attitudinal measures to capture both direction and intensity in a single item as respondents vary the extent of their agreement or disagreement to a statement, i.e. respondents may '(dis)agree' or 'strongly (dis)agree.' The more indirect Value of Children measures can use Likert type items to capture both direction and certainty. However, this approach is not readily applicable for many fertility preference questions. In particular, the questions on total number of children such as 'how many children would you like to have?' require a second follow-up item to measure uncertainty, such as 'how certain are you that you will have this number of children?' This is not always undertaken due to the time and space constraints of large general social surveys.

This represents a problem, since evidence suggests that individuals are frequently uncertain about their fertility preferences. (Ni Bhrolchain, Beaujouan et al. 2010) show that when asked about their expected age at childbearing respondents displayed a clear digit preference whereby they disproportionally choose ages ending in either 0 or 5. This is considered to be 'compelling evidence of substantial uncertainty' (Ni Bhrolchain, Beaujouan et al. 2010) page 26). Qualitative work by (Bernardi, Mynarska et al. 2010) has shown that the respondents who report 'don't know' as an answer category vary a great deal in what this response means to them. (Zabin 1999) has argued that a failure to adequately control for uncertainty has been major weakness in the analysis of fertility preference measures.

There are a whole range of factors such as partnership, employment and actual experience of having children that will influence fertility intentions. It is difficult for respondents to predict their future circumstances, which will in turn accumulate their uncertainty when considering their options for childbearing. The primary aim of this paper is to highlight the possibilities of internal question ordering 'context effects' within social survey questionnaires. It is because fertility preferences are so dependent on the external conditions of an individual's life that we suspect that priming individuals to think about particular topics will alter their responses to fertility preference questions.

The effect of preceding questions

Survey methodologists are well aware of the risk of preceding question or 'context effects' (Tourangeau, R., L. J. Rips, et al. 2000) (Rimal and Real 2005). Preceding questions have been shown to significantly influence the reporting of subjects as diverse as visual impairments (Todorov 2000), life satisfaction (Schwarz, Strack et al. 1991) and the approval of census data collection (Tourangeau, Singer et al. 2003). In the process of answering an attitudinal item, respondents generally have a very short amount of time to produce an opinion, often on a highly complex issue. Formulating such an attitude requires a respondent to almost instantaneously retrieve from their memory relevant information, potentially over a whole range of topics. Previous items may result in certain information being retrieved more readily than other information.

Because fertility preferences are related to so many contextual factors there are numerous potential priming effects that could influence them. For example, preceding questions could (unintentionally) prime a respondent towards thoughts of the costs of children; being potentially detrimental to a career, the physical pain of childbirth or, more positively towards the benefits of children; such companionship and old age support.

Methods
In this paper we use randomised experiments. This is a rather different method to those usually employed by demographers. Randomised groups are created that are theoretically systematically identical except for one manipulated 'treatment' characteristic; in this case the preceding priming questions that the participants received prior to the measurement of their fertility preferences. Statistical analysis is used to examine the differences between the groups, and the observed differences are attributed to the manipulated characteristic. Experiment participants are normally recruited from a non-probability purposive sample. Such experimental studies have strong 'internal validity' (Shadish, Cook et al. 2001) though caution should be exercised on their generalisability to wider populations because of the non-representative nature of the sample.

In this paper we show the effect of preceding questions in two different samples. In our first study we use a non-probability sample of UK students. The second study is embedded in the broadly representative Innovation Panel of Understanding Society - the UK Household Longitudinal Study (UKHLS). The Innovation Panel is a sub-sample of the UKHLS that has been reserved for methodological experiments.[1] Our study represents a unique opportunity to test context effects in a sample that is more representative of the UK population than is standard for most psychological testing.

Increasing the representativeness of the experiment's participants come at a potential cost of increased heterogeneity in these participants. This increases the risk that the allocated groups randomly contain differences in their background characteristics, and that aggregate effects mask variance in the effects within sub-groups. Whilst the first study draws its participants from UK higher education students this group is still quite diverse in terms of socio-economic background, ethnicity etc. Therefore both studies use multivariate controls in their analysis.

In psychological experiments replication is important. Bishop, Oldendick et al. (1985) showed that some context effects are not easily replicated. We have used two samples, and several different sets of priming questions to highlight the range of questions that might risk inducing context effects on fertility attitudinal items. This strengthens our arguments that fertility intentions are at genuine risk of context effects. Both studies obtained the appropriate levels of ethical clearance.

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[1] For more information on the Innovation Panel and the UKHLS please see
http://www.understandingsociety.org.uk/design/innovation/default.aspx

Study One: The effects of preceding questions about mortality

Methods

In this study we used 2,315 voluntary participants from UK universities, who answered a question on fertility preferences after a battery of questions on adult mortality, childhood mortality or dental health, or without any preceding questions. The fertility preferences question asked was the same as used in the Demographic and Health Survey series '*If you could choose exactly how many children to have over your whole life, how many would that be?*'

We compared the preferences of those participants primed with mortality or dental health to a control group who answered questions on fertility preferences before those on mortality or dental health items. In line with demographic transition theory (Montgomery and Cohen 1998) our hypothesis was that higher mortality perceptions would increase fertility preferences, while non-fatal dental health questions would not have any effect on fertility preferences.

Results

The bivariate results are set out in Table 2. Additional multivariate analysis controlling for heterogeneity showed that the significant effects largely occurred in male respondents. The multivariate results are set out in Table 3. In this multivariate analysis we modelled separately the probability of desiring at least one child, using logistic regression on all respondents, and the number of children desired, using OLS only for those respondents who wanted at least one child. We present both regression results in terms of the regression coefficient to aid the comparability of the effect sizes (rather than the coefficient's exponentiated 'odds-ratio' which is often used to show logistic regression results). In this study we do not present the control variables due to the non-representative nature of the sample, though we do show the analysis split by sex.

Compared to controls, preceding questions on adult mortality increased the desired number of children for males. Priming with child mortality perceptions increased a desire for childlessness, again most strongly in males. Preceding questions on dental health actually had marginally significant effects, whereby they marginally increased the likelihood of a respondent reporting to want to be childless.

Study Two: The effects of preceding questions about a respondent's close social network

Methods

The second study looks at question-ordering effects in the Innovation Panel, a subsample of 1,500 representative households from the UK HLS. Here participants were randomly asked two questions on fertility intentions either side of a battery of questions on their close social network (consisting of the respondents' three closest family or friends). The fertility intentions questions used were the same as used in British Household Panel Study: *a) 'Do you think you will have [any more/any] children?'* and *b) 'If yes, how [many more/many] children do you think you will have?'*

Our hypothesis was that respondents who receive the questions on fertility intentions *after* the questions on close family and friends should report increased fertility intentions. Very simply, thinking about their close social network (particularly their relatives) will prime the individual's salient thoughts towards potential informal 'free' childcare and social support when having children. Such childcare and support reduces the cost and opportunity costs of children, and thus should lead respondents to report higher intended fertility (Turke 1989; Newson, Postmes et al. 2005).

Results

Our initial analysis compares differences between the experimental conditions. These results are set out in Table 4. The initial results are generally in the expected direction. However the bivariate effects are not statistically significant. The Innovation Panel contains a range of different experiments. This experiment was limited to the 409 respondents who completed the computer aided self-completion instrument, and who were eligible to be asked such a question (e.g. women were not asked the fertility preference questions when they were over 45). There were only 123 valid responses to the second question, and the effect was therefore unsurprisingly non-significant. The effect on the second question is also biased by an outlier. Removing the outlier makes the effect even weaker.

We conducted multivariate analysis for the first question by fitting a logistic regression model to predict if the respondent answered 'Yes' i.e. they will have (more) children. We controlled for sex, age, whether the respondent currently has children, employment, household composition and marital status. The main effect of the treatment is only marginally significant in this model. However when an interaction with marital status is included then the priming treatment for those who are not married is significant at the 5% level. Those who are not married may have thought less about having children, and so will be more influenced by preceding question priming. Those who not have a partner may rely more on their close social support network if they did decide to have children. No other interaction effects were significant at the 5% level. These results are given in Table 5.

These are preliminary results. A second wave of the experiment is also being conducted in late 2012.

Conclusions

Fertility intentions are important. Yet analysis of both qualitative interviews (Bernardi, Mynarska et al. 2010) and quantitative surveys (Ni Bhrolchain, Beaujouan et al. 2010) has highlighted the uncertainty surrounding fertility intentions. Here we employ experimental methods, often used in psychology but not often employed in demography, to demonstrate this same point. The effect sizes shown here are not particular great, and are influenced by the characteristics of the respondent, but we hope we have highlighted that it is plausible that some fertility preference measures might be influenced by their preceding questions. The key argument that we wish to make is that it is important to carefully design and interpret fertility intentions items within multipurpose surveys.

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Table 1: A selection of some questions on fertility attitudes asked in social surveys

Survey	Questions asked
General Household Survey	"Do you think that you will have any (more) children (after the one you are expecting)?" "How old do you think you will be when you have your first/next baby (after the one you are expecting)?"
British Household Panel Study	Do you think you will have any (more) children?O How many (more) children do you think you will have?
National Child Development Study (1991) and British Cohort Study (1999-2000)	Do you intend to have any (more) children? How many (more) children do you intend to have?
Millennium Cohort Study	*[To parents]* Do you plan to have any more children? (2001-2003)
European Social Survey (ESS)	Do you plan to have a child within the next three years? (Round 2) How much do you approve or disapprove if a man/woman…chooses never to have children? (Round 3)
Eurobarometer survey	Generally speaking, what do you think is the ideal number of children for a family? And for you personally, what would be the ideal number of children you would like to have or would like to have had?' How many more children do you (still) plan to have
American National Longitudinal Survey of Youth	How many (more) children do you expect to have?
Household, Income and Labour Dynamics in Australia survey (HILDA)	Would you like to have [a child of your own/ more children] in the future? And how likely are you to have [a child/ more children] in the future?
Demographic and Health Survey (DHS)	If you could choose exactly how many children to have over your whole life, how many would that be?'

Table 2: Study One - Bivariate analysis all respondents – Frequency and %

	Adult mortality		Child mortality		Dental health		Control	
0	30	(10%)	28	(10%)	29	(9%)	89	(6%)
1	9	(3%)	10	(3%)	15	(5%)	71	(5%)
2	121	(39%)	109	(38%)	147	(46%)	580	(42%)
3	96	(31%)	73	(26%)	81	(25%)	400	(29%)
4	38	(12%)	51	(18%)	38	(12%)	192	(14%)
5	20	(6%)	15	(5%)	10	(3%)	63	(5%)
Chi2 test p=0.054								

Table 2: Study One - Multivariate regression analysis

	A: Ideal number of children (1-5) (OLS)		B: Desires Childlessness (Logit predicting if desires childlessness)	
	coef	p	coef	p
MALES *Omitted category: Control - No prior questions*				
Adult (own) mortality	0.23**	0.034	-0.40	0.501
Child mortality	0.54	0.649	1.03**	0.011
Dental health	-0.050	0.702	0.848*	0.062
n	478		555	
FEMALES *Omitted category: Control - No prior questions*				
Adult (own) mortality	-0.05	0.502	0.56*	0.052
Child mortality	-0.05	0.543	0.31	0.326
Dental health	-0.13*	0.092	0.55*	0.062
n	1182		1306	

*** p<0.01, ** p<0.05, * p<0.1 Removing participants who were already parents and controlling for Age, Expected Income, Parental education, Country of origin, Ethnicity, Religiosity, Partnership status, Prior consideration of childbearing, Total sibship size, Recent experienced of mortality, Life expectancy and Index of Multiple Deprivation score for participant's current address. Dummy variables used for missing values

Table 3: Study Two – Bivariate analysis

	Asked **before** 3 close social network questions	Asked **after** 3 close social network questions	Total
a) Do you think you will have any more/any children?			
No (Freq)	165	120	285
Yes (Freq)	61	63	124
% Yes	26.99%	34.43%	
Total	226	183	409
Chi2 test: p = 0.104			
b) If yes, how many more/many children do you think you will have?			
One	21 (34%)	26 (42%)	47
Two	32 (52%)	23 (37%	55
Three	7 (11%)	11(18%)	18
Four	1 (2%)	1 (2%)	2
Eleven	0	1 (2%)	1
Mean desired children	1.80	1.93	
t-test p=0.26			

1 respondent removed at part b stage as they responses was 'Don't know'

Table 4: **Study Two - Multivariate regression analysis**

	Thinks they will have any/ any more children (Logit model predicting if expects more children)			
	Model 1		Model 2	
	coef	p	coef	p
Treatment of preceding questions on close social network (omitted category no preceding social network questions)	0.462*	0.089	0.693**	0.047
Interaction: Treatment * Married			-0.604	0.282
Male (omitted category Female)	-0.875**	0.015	-0.886**	0.014
Age under 30 (omitted category Over 30)	2.355***	0.000	2.359***	0.000
Parent (omitted category Childless)	-0.810*	0.067	-0.823*	0.063
Employed (omitted category Not Employed)	0.415	0.223	0.437	0.203
Household contains (omitted household does not contain parents or siblings):				
Parents	0.473	0.294	0.522	0.249
Siblings	0.198	0.677	0.179	0.706
Married	0.051	0.883	0.353	0.427

*** p<0.01, ** p<0.05, * p<0.1