Reports of Fertility Preferences:
Assessing the Effects of Priming with Social Contexts

Emily A. Marshall
Population Studies Center
University of Michigan
eamarsha@umich.edu

Hana R. Shepherd
Department of Sociology
Rutgers University
hshepherd@sociology.rutgers.edu

ABSTRACT
This study investigates how social context can influence reports of fertility preferences. We use experimental design in a web survey to examine how priming respondents to think of different social context affects their subsequent reports of fertility preferences. Using multiple measures of fertility preferences, we find that the effects of priming differ depending on the measure. We also investigate differences by gender, and find that the effects of priming do vary by gender. Additional exploratory analyses suggest that some priming effects may interact with other socio-demographic characteristics or aspects of social identity, such as political views. In addition to the goal of improving the measurement of fertility preferences, this research contributes to a larger research agenda to test theories of culture and cognition as a means to better understand social influences on demographic behaviors.

INTRODUCTION

Fertility preferences and ideals are a key variable for demographic research. Yet many studies have highlighted the fact that the relationship between attitudes, ideals, expectations, and behavior is far from straightforward (*e.g.*, Agadjanian 2006; Quesnel-Vallee and Morgan 2003; Barber 2001). Demographers have long questioned the reliability and validity of data on fertility preferences collected using conventional survey instruments (*e.g.*, Demeny 1988). Studies in other domains have shown that survey responses can be significantly affected by survey design, including question wording, question order, and answer format (Couper et al. 2004; Schwarz and Hippler 1991). Responses can also be affected by the social context in which the survey is administered, such as the presence of others, being located at home vs. work, etc. (Schwartz and Strack 1991). Nevertheless, massive investments in past, present and future data collection using conventional survey instruments mean that survey responses are a key source of information for researchers of demographic processes. Learning more about survey design and social context effects in demographic research will allow demographers to use this information most productively.

This study presents an innovative approach to data collection for a commonly-used demographic measure: desired family size. Using an experimental web survey, we examine how reported fertility preferences vary depending on the social context that respondents are primed to think of while reporting their preferences. This research design allows us to address two key questions:

1. How do social context primes affect measures of fertility preferences? Are some measures more sensitive to priming effects than others?
2. Do the effects of social context primes vary for different subgroups in the population? Specifically, does gender moderate the effects of social context primes?

This empirical study of variation in reported preferences is also part of a broader program to collect data that reflects the insight that cultural tools—including values, norms, narratives, and scripts—are not stable traits of individuals, but are constructed, learned and used by individuals in ways specific to the social contexts they find themselves in.

Theoretical Background

This project heeds recent calls for empirical demographic research to use more realistic theoretical models of the effects of culture and beliefs on demographic behavior, drawing on

recent advances in psychology and other social sciences (Bachrach and Morgan 2013; Thornton et al. 2012; Johnson-Hanks, Bachrach, Morgan and Kohler 2011). In this project, our research design incorporates findings from social psychology about the ways that human thought and behavior are shaped by social contexts. We draw on social-psychological theories of construal and attitude formation that explain observed priming effects in other domains in order to learn more about how survey respondents think about questions on fertility preferences, and how other domains of social life are related to their thinking about fertility preferences.

Research in social and cognitive psychology has moved away from models of behavior as mainly or exclusively the result of deliberative decisions, toward models that stress the contingency of judgments and attitudes. Reports of mental associations (e.g., attitudes and beliefs) are now believed to be highly context-specific, and to sometimes result from automatic mental processes that largely avoid both formal reasoning and explicit intentions (Schwarz and Strack 1999). These developments raise the question of how chronic or context-independent desired fertility is. Are fertility preferences deep-seated, cultivated across years of experience and exposure to cultural models, or are they constructed "on the fly" in the context in which the question is asked?

The malleability of responses to question context presents an opportunity to examine the factors that individuals weight most strongly in determining their desired fertility. If individuals are primed to think about their own family background, about religious messages encouraging larger families, or about the economic costs of having children before they report their desired family size, will their responses to the question vary from similar respondents for whom those images or messages are not made salient? This also touches on a question of interest to scholars of culture across disciplines: how do individuals use socially shared representations of child-bearing in making their own decisions about desired fertility? Among our "cultural toolkit" of representations and behaviors regarding fertility (Swidler 1986), under what conditions are some of these tools used? How do individuals assess the set of factors relevant to child-bearing, and how malleable are the weights of these factors? This study will begin to address these questions by examining which features of decision making around desired fertility, when made salient, have the greatest impact on reports of desired fertility.

Research Design

In order to learn more about how survey responses about fertility preferences change with social context, our study uses random assignment of respondents to conditions that prime different social contexts, and compares responses across groups. Each respondent randomly assigned to one of the versions of the survey, which was completed online. The first survey module varied across conditions, and was designed so that respondents reflected on a certain social context or social role. Immediately after this priming module, respondents received a second module with questions about their fertility preferences. Observing how their responses to this module vary *across* versions of the survey allows us to see how thinking about the topic in the previous module affects reported fertility preferences in aggregate. In addition, we observe whether priming effects occur more for certain measures of fertility preferences than for others. Observing variation in responses *within* each version of the survey allows us to see how respondents can react differently to a single priming context. In addition to aggregate comparisons across treatment groups, our study also examines differences by gender in responses within groups, as an example of how respondents' socio-demographic characteristics, or their social identities, can shape their responses to primes. A third module collected demographic characteristics and attitudinal measures. The second and third modules were identical across all versions of the survey. The control group received the second module of questions about fertility preferences with no priming questions preceding it, and were asked only the questions from the second and third modules.

This approach differs from methods used to study within-individual variation across real-life social contexts, such as ecological momentary assessment (experience sampling) and day reconstruction (Kahneman, Kruger, and Schwarz 2006). Real-life contexts may well produce stronger effects than priming questions in a web survey, especially since we did not attempt to control the context in which respondents completed the web survey: they may have been at the library, in their dorms, or in other contexts that have their own priming effects. Our approach has some advantages, however: in addition to the expense of methods that follow respondents across real-life social contexts, they limit researchers' ability to assign respondents to a specific context. Although we cannot control where respondents complete the survey, random assignment to priming conditions within the survey is easily executed. The random assignment used in this

study ensures that with sufficiently large groups, respondents will differ systematically only in the experimental condition to which they were designed, and statistically significant differences in responses that appear across treatment groups can thus be attributed to the experimental treatment.

The treatment conditions chosen for testing are domains of social life that are known or hypothesized to be related to fertility preferences: respondent's family background, religion, financial limitations, uncertainty about the future, career aspirations, national or ethnic identity, modernization and development, politics, and gender roles. We expected that priming these domains might strengthen the effect of known associations. For example, since religiosity is known to be associated with fertility preferences (Hayford and Morgan 2008), we expected that priming respondents to think about religion would strengthen this association.

Hypotheses

Variation by Type of Response: Most broadly, we expected that both dependent variables would vary by treatment condition. However, we expected less variation in reports of desired family size than in responses to the work/children tradeoff question. First, we expected that a strong norm for two-child families would give respondents an anchor for this measure. Second, studies of priming effects in other domains show that effects are stronger for cases in which respondents may not have thought about the exact formulation of the question before. It is more likely that college students have thought about how many children they want to have than it is that they have thought about the specific tradeoffs presented as options in the work/children tradeoff question.

Variation by Gender of Respondents: We also expected that the effect of some treatment conditions would differ for male and female respondents. One cause of such differences could be differences in the *salience* of certain primes to the issue of fertility preferences. For example, it may be common for female respondents to think about their plans for family formation when they think about their career plans *outside* of the context of this survey (particularly in the context of recent highly publicized discussions of difficulties women face in balancing career and family responsibilities), while male respondents may rarely connect these two domains in their own thoughts. If this were the case, then career primes might not be as relevant to male respondents' reports of fertility preferences, and might not affect them as much as they affect

female respondents' reports. Another cause of gender differences in treatment effects could be the *kinds of associations* that respondents make between the primes and fertility. For example, if priming gender roles leads respondents to think of traditional gender roles, this could cause women to select responses to the work/children tradeoff question with less work for pay and more children, while it could cause men to select responses with more work for pay and fewer children.

Variation by Condition: In addition to the broader hypotheses outlined above, we have hypotheses about the effects of each specific condition on responses. Priming questions for each condition are provided in the Appendix.

Family Background: We expect that respondents from larger families will have higher desired family size, and will also choose more children (and less work) in response to the work/children tradeoff question, when compared with respondents from smaller families. We expect that the family background module (which ask respondents how many siblings they have, and to remember something they did with a close family member growing up) will strengthen this tendency, so that a positive association between number of own siblings and the two outcomes will increase in magnitude in the treatment group, compared to the control group.

Religion: Although associations between religious denomination and fertility have declined in the U.S. (Westoff and Jones 1979), an association between religiosity and fertility persists (Hayford and Morgan 2008). We predict that asking respondents about their religion—religiosity (importance of religion and religious attendance), denomination, and something important about their religious belief—will strengthen the positive association between desired fertility and religiousness, compared with the association observed in the control group. We expect that respondents will also follow more traditional gender roles after the religion prime, leading men to choose more work and less children, and women to do the reverse.

Financial limitations: Financial hardship can have important implications for fertility: economic downturns have been linked to lower fertility (Sobotka et al. 2010). In the financial limitations treatment group, respondents answer questions about times they have had to save up to buy something, and not been able to buy something because of the cost. We expect that for both genders, mean desired fertility will be lower for the financial limitations treatment group than for the control group. We also expect that for both genders, the treatment group's mean response to

the work/children tradeoff question will be closer to the "full-time" end of the tradeoff spectrum than the control group's mean response, although this latter effect may be stronger for men than for women, since men may feel more traditional pressure to be family breadwinners.

Future uncertainty: Concerns about stability, as well as strictly financial concerns, may also affect fertility. This priming module asks about the possibility of difficulty finding a job and being unemployed after graduation (these questions were designed with recent high unemployment rates in mind), as well as things respondents are afraid might happen in the near future. We expect that the effects of this condition on both dependent variables will be the same as the effects of the financial limitations condition.

Career: Young people's career aspirations and trajectories can affect family formation, since career goals can be "competing alternatives" to family priorities (Barber 2001). Conflicts between professional and family responsibilities, particularly for women, have been highly visible in recent public discussions of "work-family balance," as women with families and high-powered careers have contributed at times opposing views on the topic. The career module asks about career aspirations: respondents' dream job in 10 years, and what makes them a good fit for this job. We expect that the career condition will decrease women's desired fertility, but not men's, since women are more likely to see fertility preferences and career aspirations as competing goals on their own. Once a tradeoff is required by the work/children tradeoff question, however, we expect the career condition will move the mean response toward "full-time" for both genders.

Heritage: In this condition, respondents are asked to think of an association with a certain national, ethnic, or regional identity, and to think of something related to that identity that they are proud of. We expect that this treatment will vary with the identities that respondents report. If they report ethnic identities that are associated with distinct fertility preferences, we predict that this treatment condition will strengthen that association.

Modernization and development: There is increasing evidence that many people associate modernization and development with smaller family size, both descriptively and causally (Thornton 2005; Thornton et al. 2012). Following this theory, we expect that asking people about how family life has improved since the 1950s will reduce desired family size. We expect that

women's responses to the work/children tradeoff question will move toward fewer children and more work, but that men's responses will be unaffected.

Politics: Links between liberal political beliefs and lower birthrates have been related at the population level to behaviors characteristic of Lesthaeghe's "second demographic transition," including later age at first birth and more women who remain childless (Lesthaeghe and Neidert 2006). We expect that the politics condition, in which respondents place themselves on a liberal-conservative spectrum and report which political party best represents their views, will strengthen this association.

Gender: Traditional gender roles incorporate expectations for family roles. We expect that by priming gender identity (asking respondents about same-sex friends and what they do together, asking about a time they "felt like a real man/woman"), we will increase conformity with traditional family roles. We expect desired family size to increase for both men and women, but for men to choose more work and fewer children, and women to choose less work and more children, in this condition compared to the control group.

DATA, MEASURES, AND ANALYTIC STRATEGY

Sample, Response Rate, Selection and Attrition

Survey respondents were drawn from the population of undergraduate students at the University of Michigan and Princeton University. All analyses reported below combine responses from students at both universities. This population was chosen partly because university students provide an unusually accessible and complete sampling frame for web surveys. In addition, nearly all of these students belong to a narrow age group, and most of them have not had children yet, which greatly simplifies our analysis, as fertility preferences often change over the life course to correspond to actual fertility (Morgan and Rackin 2010). Although this is a select population not representative of a broader population, a representative sample is not required to achieve the study's goals. Our main goal is to study processes that affect reports of fertility preferences, not to make population estimates. We expect that findings from a study drawing from a different population would be different in some respects and similar in others.[1]

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[1] A version of the survey with fewer conditions, conducted at a selective university in Turkey, will allow us to test these expectations. Comparative analyses of these data are ongoing. We hope to later expand the study to a representative sample of a population that includes young people other than university students, as well.

An invitation to participate in the survey was sent to the population of undergraduate students at Michigan (26,000 students) and Princeton (4,884 students), with a link to the web survey. Students who completed the survey were entered into a drawing for prizes of $50. A total of 6,467 students responded to the survey, for a response rate of about 21%. This response rate is in line with other web surveys of undergraduate students using similar recruitment methods (Kaplowitz et al. 2004:98). We expect that the students represented in this study are not representative of the entire student body with respect to some characteristics, but we do not expect that they differ from non-respondents in ways that threaten the validity of our findings. This study is designed to examine differences in across experimental conditions to which respondents are randomly assigned. Since the main goal is to study variation resulting from experimental manipulation of contexts, low response rates would only threaten our findings if respondents react to the experimental conditions differently than non-respondents would have— if thought processes about family size somehow operated differently for respondents and non-respondents. We did attempt to minimize selection on characteristics such as interest in family and children by representing the survey as a study of "life after college." Most of the selection into the study took place before respondents saw the first survey question. Of respondents who began the survey, 83% completed it.

Differential attrition across treatment conditions is the greatest threat to this research design, as it would introduce problems of selection despite random assignment to treatment conditions. Some proportion of survey respondents always drops out; in web surveys most of this attrition occurs on the first few pages of the survey. Across all treatment conditions of the study, between 79 and 84 percent of respondents completed the survey, and 88 percent of respondents dropped out during the priming module, so attrition rates were similar across conditions. Although this does not completely rule out the possibility of some selection into conditions, it is the best available measure of differential attrition. In addition, lower attrition in the control group may well be due to the fact the control group's survey was shorter, since they did not complete a priming module. It therefore does not suggest to us selection related to the variables of interest.

Table 1 provides descriptive statistics for the respondents, pooled across all treatment conditions. (All tables appear at the end of the paper.)

Measures

In the control condition, participants received no initial module of questions designed as context primes, and instead began with the questions that served as dependent variables described below. In the treatment conditions, the first set of questions respondents saw provided the context prime (priming questions for each condition are provided in the Appendix). The questions were designed to evoke memories or thoughts related to a domain. For example, the family background condition, participants were asked how many siblings they had, what words described the family they grew up in, and what activities they did regularly with a member of their family.[2] Simple questions were presented first to minimize attrition in each of the treatment modules.

After the priming module questions in the treatment conditions, participants responded to the main dependent variables. The first dependent variable used in this analyses, is based on a common measure of desired fertility used in demographic surveys: "How many children do you want to have?" (Response categories ranged from 0 to "5 or more"). The second question asked respondents to choose among four specific trade-offs between work and number of children: no children and a full-time job, one child and a three-quarter-time job, two children and a half-time job, or three children and no job.[3] Responses to this question thus formed a four-point scale where lower values indicate a stronger preference for work over children and higher values indicate a stronger preference for children over work.

Following the dependent variables, respondents answered questions about their background characteristics including gender, age, race and ethnicity, number of siblings, parents' educational attainment, US-born status (both respondents' and their parents'), number of cousins, mothers' work outside the home, religious denomination and religiosity, political views, and importance of future career.

Analytic Strategy

For each of the two dependent variables of interest (desired family size and work/kids tradeoff), for each treatment condition we compared the mean response for that condition to the

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[2] In some cases, the replies to these questions also appear in the third module of the other groups, and respondents in other conditions can be compared on these dimensions. For example, the question on political beliefs that appears in the politics treatment condition also appears in the background characteristics module for respondents in other conditions. When such appear in the priming module of a certain treatment group, they are removed from the background module for that group, so that no question appears twice to any respondent.

[3] This measure was previously used in the Intergenerational Panel Study of Parents and Children, although in that study men were asked about their preferences for their wives, not themselves (Thornton, Axinn, and Xie 2007).

mean response for the control group. Since treatment effects, as well as associations with other characteristics, are expected to vary by gender, in addition to pooled models where gender was included as a control variable, we conducted separate regression models for male and female respondents. We first used bivariate linear regression models, with the predictor being a dummy variable with value 0 for observations in the control group, and value 1 for observations in the treatment group tested in that model. The intercept is then the control group mean, and the coefficient of the treatment dummy is the difference between the treatment-group mean and the control-group mean. The significance level of the coefficient shows the significance of the difference in group means for the control and treatment groups, with the same results as a two-tailed t-test.

We then ran nested models, again with a separate model for each outcome of interest for each condition. The first set of models with covariates uses measures of family background and socio-demographic characteristics: number of own siblings, race, nativity, and mother's educational attainment and work status. The second set models adds covariates comprising measures of attitudes and beliefs: political position (on a 5-point liberal-conservative scale), religiosity, and importance of future career (on a 100-point slider scale). These covariates were chosen since they are known to be associated with fertility in the U.S., and were also observed to be associated with the outcomes of interest in this sample. Since our study uses an experimental design, the controls are not needed to establish a causal relationship between the treatment condition and differences between the control and treatment group. The regression models with covariates allow us to examine how the effect of the treatment condition on the dependent variable compare to the associations between the dependent variable and other factors associated with fertility preferences. They also give us the opportunity to examine whether the treatment effect may be moderated by the characteristics used as control variables. Planned analyses will also test alternate specifications for the regression models, in addition to OLS: zero-inflated Poisson models for desired family size and ordered logistic regression for the work/children tradeoff.

RESULTS

1. Desired Number of Children

The distribution of the first dependent variable, desired number of children, is shown by gender for the control group in Figure 1 (N=5,419). Bivariate regressions for this dependent variable, comparing each treatment condition group to the control group, showed no significant difference between the control group and any treatment group in desired number of children. Splitting the sample by gender, separate bivariate models for men and women also found no significant differences between treatment and control groups for any condition for either gender. The nested models described above found only one marginally significant treatment coefficient for women, for the heritage condition. In light of the number of models run in this analysis, it is not clear whether this finding of statistical significance truly represents a significant difference.

2. Job/Children tradeoff

The distribution of the second dependent variable, the choice of tradeoffs between work and children, is shown by gender for the control group in Figure 2 (N=5,408). Bivariate regressions for this dependent variable comparing each treatment condition group to the control group find significant differences between the control group and the future uncertainty, modernization/development, and gender roles treatment groups (Figure 3). All of the significant differences are in the negative direction. (A lower value for this variable is closer to the "full-time work, no kids" endpoint of the four-point scale, and farther from the "no work, 3 kids" endpoint.) The future uncertainty treatment effect is significant at the 0.05 level; the other two significant effects are significant at the 0.10 level.

Splitting the sample by gender, separate bivariate models for men and women found only one significant difference between treatment and control groups for men: for the religion treatment group, the group mean is marginally significantly lower than the control group mean ($p < 0.10$). The results for women are quite different. Treatment group means are significantly lower than the control group mean in five of the treatment conditions (see Figure 4). The difference is marginally significant ($p < 0.10$) for the future uncertainty, career, and gender treatment groups, and significant ($p < 0.05$) for the heritage and modernization/development groups.

Three of the observed effects support our hypotheses. We expected that thinking about future uncertainty would cause women to focus more on work and less on children in their responses, since children bring financial costs, including less resources to devote to a career.

(However, we did not expect to find a significant effect for women, but not for men, in this treatment group. We will return later to the lack of significant effects of treatment for men.) We also expected that thinking of career aspirations would have the observed effect on women's responses: if some women see family and work opportunities and responsibilities as competing with each other, then focusing on their careers should lead them to downplay their family aspirations. In addition, we expected that thinking of modernization (in the form of "how families today have improved over the 1950s") would lead to cognitive associations with the benefits of smaller families, and thus responses oriented toward fewer children.

Two of the observed effects are not in the expected direction. The gender treatment group was expected to prime thoughts of traditional gender roles, which we expected to lead women to prefer more children and less work. However, the opposite proved to be the case. It's possible that the questions intended to prime traditional gender roles instead provoked an oppositional position in some respondents, who might disagree with assumptions of traditional gender roles. Our limited data seems to support this theory. Women's free-response replies to the prompt "describe a time you felt like a real woman" were coded as gender-traditional, gender-non-traditional, or refusal to answer. The "gender-traditional" subgroup's replies to the work/children tradeoff item were significantly more child-oriented and less work-oriented than those of the rest of the group. The second unexpected result is in the heritage condition, which we expected to lead women to choose options with more children and less work, on average, than the women in the control group chose. In this case, we don't have additional information that can help us understand how this prime operated differently than we expected.

Regression with Covariates

To better understand how treatment effects are related to respondents' socio-demographic characteristics, we ran OLS regressions for the most of the comparisons that showed significant differences between treatment and control in t-tests, controlling for other characteristics. (Later analyses will use zero-inflated Poisson and ordered logit models as well.) These analyses focus on the combinations of dependent variable and gender that showed significant differences for more than one treatment condition: the work/children tradeoff dependent variable and the pooled-gender and women-only samples.

Work/children tradeoff, pooled-gender sample: The results from the bivariate regressions and the full regression model (including a covariate for gender) are shown in Table 2. Effects of treatment condition on the outcome that are significant in the bivariate model (the future uncertainty, modernization/development and gender roles conditions) are robust to the addition of covariates, with the exception of the gender roles condition. In addition, two treatment conditions whose coefficients are not significant in the bivariate models are significant in the full model: finance and heritage. Since the value for the treatment variable is the result of random assignment, it is difficult to substantively interpret the meaning of these changes. It seems likely that processes that vary by gender are an important part of the story. To clarify these relationships, we turn to the same analysis for the sample of women only. The analysis for men had only only one significant treatment effect (religion), and due to the number of trials, we hesitate to make too much of this result.)

Work/children tradeoff, women-only sample: The results from the regression models for women only are shown in Table 3. Of the five significant treatment effects found in the bivariate models, three are robust to the addition of covariates: career, heritage, and modernization/development. For the future condition, which is not robust to the addition of covariates, regression results show that the coefficient for the effect of the treatment is significant and in the expected direction. Nested models (not shown) demonstrate that the treatment coefficient remains significant when controls for respondent's number of siblings and number of cousins (both significantly and positively associated with the dependent variable) are added to the model, as it does when political views and religiosity are added. Although the p-value crosses the 0.10 threshold in the full model, neither magnitude of the coefficient nor the p-value for the treatment dummy variable changes very much across these models.

Of the robust treatment effects, the career and modernity effects are in the expected direction: thinking of career aspirations leads women to choose more work and fewer children, compared to women in the control group. Thinking of improvements in family life since the 1950s has the same effect, as predicted. The effect for heritage is more difficult to interpret. Our predictions were conditional on the associations respondents made with particular national, ethnic, or regional identities. The closest proxy for this in the socio-demographic characteristics we collected is race, and there is some indication that the effect is strongest for women who

report their race as East Asian, although small sample size limits our ability to confirm the significance of this (results not shown). Hand coding of the text responses provided by respondents when asked which identity they identify with could provide additional information on this for future analyses.

Interaction of treatment with key covariates

In addition to the regression models described above, for each dependent variable, for each treatment for which it was possible, we tested whether the treatment interacted with a characteristic of respondents that we had hypothesized could affect how respondents reacted to the treatment. For example, for the religion condition, we tested for an interaction of treatment with religiosity, since we would expect that priming religious concepts might affect responses differently for very religious respondents and non-religious respondents.

For the work/children tradeoff question with pooled genders, we found that coefficients for the main effects and interaction for the politics condition were significant at the 0.10 level. We tested an interaction of the treatment with respondents' position on the political spectrum, with conservatives on the low end and liberals on the high end. The main effect coefficients were positive for the treatment and negative for the political beliefs coefficient – as expected, respondents with more liberal beliefs wanted fewer children. Each one-point increase on the five-point political beliefs scale was associated with The interaction coefficient was also negative, indicating that the association of political beliefs and desired number of children was stronger for those in the treatment condition than those in the control, as we had predicted.

For desired family size with pooled genders, we found significant interactions and significant main effects for the key covariate for the politics and family conditions. The coefficients for the main effect of treatment were not significant (p = 0.11 and 0.18, respectively). For the politics condition, we tested an interaction of the treatment with respondents' position on the political spectrum, with conservatives on the low end and liberals on the high end. The main effect coefficients were positive for the treatment and negative for the political beliefs coefficient – as expected, respondents with more liberal beliefs wanted fewer children. The interaction coefficient was also negative, indicating that the association of political beliefs and desired number of children was stronger for those in the treatment condition than those in the control, as we had predicted.

For the family condition, we tested the interaction with the number of the respondent's siblings, and found positive coefficients for treatment and number of siblings, but a negative (but smaller) interaction effect. The results indicate that, with no other controls, each additional sibling is associated with a 0.3 increase in desired number of children for control group members – the more siblings someone has, the larger his or her desired family size. However, the size of this association is *smaller* for the treatment group than the control group: the interaction coefficient is negative. This finding is not what we had predicted. Examining the distribution for the control and treatment groups (Figure 5), we see that indeed, respondents with 4 or more siblings in the family treatment condition have lower mean desired fertility than their counterparts in the control group. These additional analyses show that treatment effects indeed interact with respondents' characteristics in some cases.

DISCUSSION

Using a web survey of over 5,000 undergraduates at two universities, this study has tested the application of findings from social psychology to demographic research on fertility preferences, asking two central questions:

1. How do social context primes affect measures of fertility preferences? Are some measures more sensitive to priming effects than others?

2. Do the effects of social context primes vary for different subgroups in the population? Specifically, does gender moderate the effects of social context primes?

We found that priming respondents with different social contexts before asking them to report fertility preferences did not affect responses to the question "How many children do you want to have?" Priming with social contexts did, however affect responses to a question about preferred trade-offs between job commitment and desired fertility. We also found large differences by gender, with men's responses changing almost not at all, in contrast to changes observed in several treatment conditions for women. Our findings of gender differences may suggest that women are more likely to perceive conflicts between their family roles and other social roles.

These results demonstrate that respondents' reports of desired fertility are malleable in the context of situational primes, but that there are limits to this malleability. When respondents are asked questions for which they have an anchor (such as a two-child norm), or questions they are likely to have devoted some thought to, priming may not affect responses as much as lab

experiments might suggest. However, when presented with a question they have never thought about before, or a question formulated in a new way, respondents may be affected more strongly by primes in the survey instrument or in their environment.

As the psychological literature on priming suggests, we found that primes affect survey responses, but not always in straightforward ways. For one thing, there is no true "control" group that is free not primed by the research instrument—the contexts of participating in research, giving informed consent, taking a survey, and (in this case) using a computer, will prime certain thoughts in respondents. In addition, respondents will be primed by many factors beyond the control of researchers. For example, with our web survey design, college students might take the survey in their dorm rooms, in the library, or another location. Each location could prime different thoughts in respondents. Differences in priming beyond the control of the researchers can come from other sources, too: for example, a student who is struggling financially or academically may be thinking about that problem most of the time, so it might be on their mind during the survey, regardless of the primes introduced by the researchers. Ferguson et al. (2009) provide a systematic comparison of why participants might differ in their response to primes. In order to explore the processes by which primes produce changes in responses, our analysis examines variation in the dependent variable *within* conditions, as well as across conditions, including correlations between this variation and respondents' observed characteristics (both demographic characteristics and attitudinal measures).

This method suggests a way in which to understand, at the individual level, patterns of association between decision domains, in this case, between fertility and career, finances, and politics. Additionally, it suggests that there are systematic differences in how different individuals respond to the same situational primes. This is part of a larger project of measuring culture by examining how different patterns of cognitive associations may shape responses to contextual primes, illuminating how environmental contexts interact with individual cognition to produce responses and behaviors (e.g., Shepherd 2011).

Appendix

<u>Treatment conditions</u>
Control group
Family background
Religion
Financial limitations
Uncertainty about the future
Career aspirations
Heritage (ethnic/national/regional)
Modernization/Development
Political views
Gender roles

<u>Priming Questions by Condition</u>

I. Family background
First we'd like to ask you a few questions about your family background.
1. How many sisters do you have? (Include half-sisters and step-sisters.)
❍ 0
❍ 1
❍ 2
❍ 3
❍ 4
❍ 5 or more

2. How many brothers do you have? (Include half-brothers and step-brothers.)
❍ 0
❍ 1
❍ 2
❍ 3
❍ 4
❍ 5 or more

3. If you had to describe the family you grew up in to an interested stranger, what are some words you would use to describe them?

_____
_____
_____

4. What family member did you spend a lot of time with growing up?

Describe something you did regularly with that family member.

II. Religion

First we'd like to ask you a few questions about your religious beliefs.

1. How important is religion in your life?
- ❍ Not at all important
- ❍ A little important
- ❍ Fairly important
- ❍ Very important

2. In the year before you started college, how often did you attend religious services?
- ❍ Never
- ❍ A few times per year
- ❍ Once or twice a month
- ❍ Once a week or more

3. What is your religious or spiritual affiliation?

4. Describe the most important part of your religion or belief system.

III. Financial limitations

First we'd like to ask you a few questions about how you handle money.

1. How much money do you normally spend in one week on entertainment and eating out?
- ❍ $0-$50
- ❍ $50-$100
- ❍ $100-$150
- ❍ $150-$200
- ❍ More than $200

2. What is the last thing you bought that you had to save up for?

3. How long did you have to save up for it?

4. Describe a time in the last year when you did not, or could not, get something that you wanted because it cost too much.

IV. Future uncertainty
First we'd like to ask you a few questions about your expectations for the future.
1. How easy or difficult do you think it will be to find your first job when you finish college?
- ⭕ Very Difficult
- ⭕ Difficult
- ⭕ Somewhat Difficult
- ⭕ Somewhat Easy
- ⭕ Easy
- ⭕ Very Easy

2. How likely do you think it is that you will be unemployed sometime in the first 5 years after you finish college?
- ⭕ Very Unlikely
- ⭕ Unlikely
- ⭕ Somewhat Unlikely
- ⭕ Somewhat Likely
- ⭕ Likely
- ⭕ Very Likely

3. What are three things that you're worried might happen in your life in the next 5 years?

　　　_____

　　　_____

　　　_____

4. List the initials or first names of up to 10 people you could rely on if something bad happened to you and you really needed help.

V. Career
First we'd like to ask you a few questions about your career plans and goals.
1. Have you chosen a major?
- ⭕ Yes
- ⭕ No

2. Do you plan to use your major (current or anticipated) in your future career?
- ⭕ Yes
- ⭕ No

3. What is the dream job that you'd like to have 10 years from now?

4. Describe two or three qualities you have that make your planned career a good fit for you. (If you don't know what career you want to have, describe two or three qualities that you hope to use in your career.)

VI. Heritage

First we'd like to ask you a few questions about where you come from.

1. Which city, state, and country were you born in?
    City
    State
    Country

2. Which national, regional, or ethnic identity do you most strongly identify with?

3. Describe something about your heritage (for example: characteristics, ideals, events) that you're proud of.

VII. Modernization and development

First we'd like to ask you a few questions comparing life today with life in the 1950s.

1. For someone like you, is life today easier, about the same, or more difficult than life in the 1950s?
❍ Easier
❍ About the same
❍ More difficult

2. Do you think that the changes in society since the 1950s have made life better for most people, or worse for most people?
❍ Much Better
❍ Better
❍ About the same
❍ Worse
❍ Much Worse

3. What are two words that come to mind when you think of families in the 1950s?

    _____
    _____

4. What are two words that come to mind when you think of families today?

    _____
    _____

5. What are some things about family life that you think have improved since the 1950s?

VIII. Politics
First we'd like to ask you a few questions about your political views.
1. How would you describe your political beliefs?
○ Very conservative
○ Conservative
○ Moderate
○ Liberal
○ Very liberal

2. How important are your political beliefs in your life?
○ Not at all important
○ A little important
○ Fairly important
○ Very important

3. Which political party best represents your political beliefs?

4. Describe a time in the past year when you stood up for or acted on your political views or beliefs.

IX. Gender roles
First we'd like to ask you a few questions about social life.1. Are you male or female?
○ Male
○ Female

[If "Male" is selected:]
2. List 3 things you and your male friends like to do together.

　　　_____
　　　_____
　　　_____

[If "Female" is selected:]
2. List 3 things you and your female friends like to do together.

　　　_____
　　　_____
　　　_____

[If "Male" is selected:]
3. Describe a time when you felt like you were "acting like a real man".

[If "Female" is selected:]
3. Describe a time when you felt like you were "acting like a real woman".

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Acknowledgments

TABLES

Table 1: Descriptive statistics of full sample

	Proportion	N		Proportion	N
Gender		5419	*Father's Education*		5368
Male	0.35		Less than 4-year college	0.22	
Female	0.65		4-year college	0.27	
Race and Ethnicity		5361	MA	0.26	
White	0.68		Other graduate degree	0.25	
Black or African-American	0.05		*Nativity status*		5425
Latino/a or Hispanic	0.04		US-born	0.88	
East Asian	0.13		Non-US-born	0.12	
South Asian	0.05		*Parents' nativity status*		5387
Other	0.05		All parents US-born	0.69	
Mother's Education		5388	At least 1 parent non-US-born	0.31	
Less than 4-year college	0.26		*Number of siblings*		5427
4-year college	0.37		0	0.09	
MA	0.24		1	0.44	
Other graduate degree	0.13		2	0.29	
			3	0.11	
			4 or more	0.06	

Table 2: Linear regression models of treatment condition on work/children tradeoff choice, sample includes both men and women

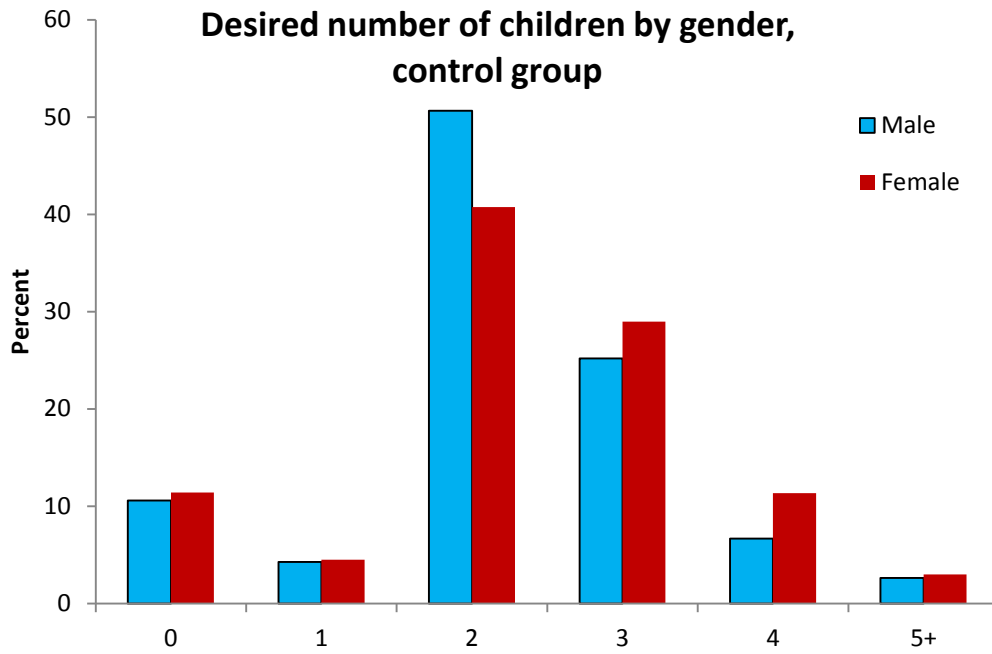|					Condition				
	Family	Religion	Finance	Future	Career	Heritage	Modernity	Politics	Gender
Bivariate model									
Treatment	**-0.02**	**-0.08**	**-0.08**	**-0.12** **	**-0.07**	**-0.07**	**-0.10** *	**-0.03**	**-0.11** *
N	1015	1034	1031	1036	1061	1017	1004	995	1021
Full model									
Treatment	**-0.04**	**-0.08**	**-0.09** *	**-0.13** **	**-0.08**	**-0.10** *	**-0.11** **	**-0.03**	**-0.09**
# of siblings	0.06 **	0.07 ***	0.07 ***	0.03	0.08 ***	0.06 **	0.07 ***	0.07 ***	0.06 **
Black *(ref = white)*	-0.23 *	-0.55 ***	-0.42 ***	-0.35 ***	-0.34 ***	-0.48 ***	-0.28 **	-0.30 **	-0.20
US-born *(ref = US-born)*	-0.07	-0.20 **	-0.10	-0.25 ***	-0.15 *	-0.18 **	-0.18 **	-0.30 ***	-0.12
Mom worked full-time *(ref = part-time/none)*	-0.08	-0.04	-0.09 *	-0.09	-0.07	-0.02	-0.12 **	-0.10 *	-0.09
Mom's education *(ref = < 4-year degree)*	-0.13 **	-0.15 **	-0.07	-0.10	-0.09	-0.16 ***	-0.17 ***	-0.04	-0.10
Political views	-0.03	-0.01	-0.04	-0.03	-0.03	0.00	-0.04	-0.07 **	-0.01
Religiosity	0.13 ***	0.12 ***	0.16 ***	0.13 ***	0.15 ***	0.18 ***	0.13 ***	0.12 ***	0.16 ***
Career importance	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***
Gender *(ref = male)*	0.44 ***	0.46 ***	0.39 ***	0.44 ***	0.36 ***	0.30 ***	0.38 ***	0.42 ***	0.41 ***
Constant	2.73 ***	2.91 ***	2.78 ***	2.91 ***	2.74 ***	2.85 ***	2.83 ***	2.90 ***	2.66 ***
N	943	965	967	970	994	952	939	927	956

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Linear regression models of treatment condition on work/children tradeoff choice, sample includes women only
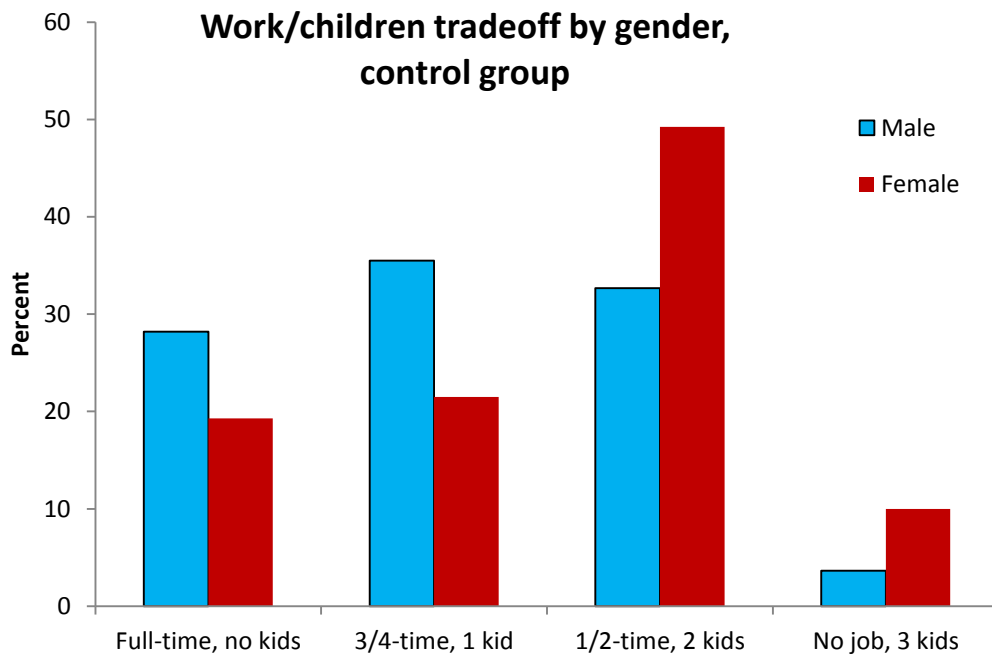
				Condition					
	Family	Religion	Finance	Future	Career	Heritage	Modernity	Politics	Gender
Bivariate model									
Treatment	**-0.06**	**-0.02**	**-0.10**	**-0.12** *	**-0.12** *	**-0.15** **	**-0.16** **	**-0.05**	**-0.12** *
N	665	640	635	638	673	644	619	632	643
Full model									
Treatment	**-0.03**	**-0.05**	**-0.11**	**-0.10**	**-0.12** *	**-0.18** ***	**-0.14** **	**-0.03**	**-0.09**
# of siblings	0.09 ***	0.08 ***	0.08 ***	0.05	0.10 ***	0.05 *	0.10 ***	0.10 ***	0.07 **
Black (ref = white)	-0.26 *	-0.72 ***	-0.53 ***	-0.40 ***	-0.37 ***	-0.61 ***	-0.43 ***	-0.38 ***	-0.39 ***
US-born (ref = US-born)	-0.13	-0.25 **	-0.24 **	-0.38 ***	-0.16	-0.28 **	-0.15	-0.37 ***	-0.14
Mom worked full-time (ref = part-time/none)	-0.19 ***	-0.06	-0.17 **	-0.21 ***	-0.13 *	-0.12 *	-0.15 **	-0.13 *	-0.17 **
Mom's education (ref = < 4-year degree)	-0.17 **	-0.13 *	-0.09	-0.11	-0.15 **	-0.12	-0.15 *	-0.07	-0.07
Political views	-0.08 *	-0.09 **	-0.07 *	-0.09 **	-0.08 **	-0.06	-0.10 **	-0.09 **	-0.06
Religiosity	0.12 ***	0.10 ***	0.16 ***	0.14 ***	0.15 ***	0.17 ***	0.12 ***	0.11 ***	0.13 ***
Career importance	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***	-0.01 ***
Constant	3.51 ***	3.81 ***	3.48 ***	3.79 ***	3.44 ***	3.65 ***	3.60 ***	3.64 ***	3.46 ***
N	648	626	624	627	661	630	604	616	624

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1

Desired number of children by gender, control group

Figure 2

Work/children tradeoff by gender, control group

Figure 3

Work/kids tradeoff, pooled genders

Figure 4

Work/kids tradeoff, women

Figure 5

Desired fertility, by own siblings and condition