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Childhood Socialization and Political Attitudes: Evidence from a Natural Experiment

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Scholars have argued that childhood experiences strongly impact political attitudes, but we actually have little causal evidence since external factors that could influence preferences are correlated with the household environment. We utilize a younger sibling's gender to isolate random variation in the childhood environment and thereby provide unique evidence of political socialization. Having sisters causes young men to be more likely to express conservative viewpoints with regards to gender roles and to identify as Republicans. We demonstrate these results in two panel surveys conducted decades apart: the Political Socialization Panel (PSP) and the National Longitudinal Survey of Youth (NLSY). We also use data collected during childhood to uncover evidence for a potential underlying mechanism: families with more female children are more likely to reinforce traditional gender roles. The results demonstrate that previously understudied childhood experiences can have important causal effects on political attitude formation.

How do childhood experiences affect the formation of political preferences? Although attitudes change somewhat over time, the development of political identity during childhood appears to profoundly influence future political decision making (e.g., Campbell et al. 1960; Green, Palmquist, and Schickler 2002).[1] Some of the most important evidence on the relationship between childhood experiences and later political attitudes comes from the groundbreaking survey research conducted by M. Kent Jennings and Richard Niemi. The numerous articles and books that emerged out of their longitudinal study of American youth generally explored how political attitudes are passed down from parent to child (e.g., Jennings and Niemi 1968, 1974; Tedin 1974, 1980). In the most recent analysis of the full four-wave panel, Jennings, Stoker, and Bowers (2009) find that intergenerational political influence persists 40 years later. In short, existing research has argued strongly for a crucial and enduring relationship between childhood experiences and political beliefs.

At the same time, a variety of potential explanations other than socialization can account for the similarity of political attitudes among members of the same household. For example, major events, people, or social forces outside of the household may simultaneously influence everyone in it, causing their attitudes to be similar. Further, recent research has suggested that some of the association between parent and child political attitudes can be attributed to genetics as opposed to environmental factors (e.g., Alford, Funk, and Hibbing 2005; Hatemi et al. 2009; Settle, Dawes, and Fowler 2009).[2] To identify the causal impact that the childhood environment has on political attitudes requires a natural experiment that enables us to isolate a specific aspect of that environment.

In this article, we consider such a natural experiment by examining the effect of siblings on political

[1]An online appendix for this article is available at http://dx.doi.org/10.1017/S0022381613000996 containing supplemental analyses. Data and supporting materials necessary to reproduce the numerical results in the article will be made available at the IQSS Dataverse under the name of the article title within one month of publication.

[2]Scholars have also explored other instances of intrahousehold political influence. For instance, Stoker and Jennings (2005) observe that husbands and wives have similar attitudes, a relationship that could be explained by spouses influencing each other. However, these findings are also subject to endogeneity bias as mates may select each other based on existing political predispositions (Alford et al. 2011; Huber and Malhotra 2012).

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attitudes. Our independent variable of interest is the share of an individual's siblings who are sisters.[3] Even assuming that child gender is randomly assigned, a major concern when analyzing the effect of sibling gender is endogenous fertility choice. Parents may choose stopping rules—whether to have additional children—that depend on the gender of the children they currently have so that an older sibling's gender is not randomly assigned. For example, parents who have a preference for boys may continue to have children when they have daughters, but not when they have sons. Therefore, children with older brothers may tend to be part of different kinds of families than children who have older sisters.[4] This means that the share of an individual's siblings who are sisters is endogenous since parents' choices about whether to have additional children determine the overall share of female children. On the other hand, *conditional on parents choosing to have an additional child*, the gender of the next sibling is assigned at random.[5] We can use this random variable to identify the effect of growing up with a greater proportion of sisters.

To estimate the effect of having sisters on political attitudes, we analyze data from the University of Michigan Political Socialization Panel (PSP) and the children of the National Longitudinal Survey of Youth (NLSY) young-adult sample. In addition to having detailed information on a respondent's siblings, each of these rich panel datasets offers unique advantages. The PSP has data on gender-role attitudes and partisanship collected over four waves—starting in 1965 and ending in 1997—enabling us to consider the effect of having sisters on political attitudes over a long stretch of time. In addition to making it possible to replicate the PSP results, the NLSY contains information on respondents' childhood experiences. Although the NLSY only asked political attitude questions recently, it asked detailed questions in earlier surveys about household tasks performed during childhood, allowing us to explore a potential underlying mechanism. Both datasets also contain detailed parental information which we use to conduct randomization checks that confirm the validity of the natural experiment. More broadly, findings in political behavior often come from a single survey or experiment. Being able to demonstrate a particular effect in two independent datasets is uncommon and increases the plausibility of the results.

In both datasets, we find that having sisters rather than brothers makes young men—but not young women—more likely to express conservative positions on gender roles and to identify as Republicans. The consistency of the positive effects for men (and the null effects for women) across specifications and datasets is striking. In the PSP, compared to male respondents whose siblings were all brothers, we estimate that male respondents who grew up with only sisters are up to a full category more conservative on gender roles on a 7-point scale. In the NLSY, which was administered more than 30 years after the first wave of the PSP, the effect of having sisters on males' gender-role attitudes is significant but smaller, suggesting that the effect may have been larger in a time of less progressive views on gender issues. The effects on partisanship are of similar size in the two datasets and statistically stronger in the NLSY due to its larger sample size.

Our analyses also suggest a potential mechanism. In the NLSY, detailed data collected from respondents during their childhood show that boys with sisters are substantially less likely to have performed female-stereotyped household tasks during childhood than boys with brothers. For girls, sibling gender has no effect on chore assignment. We also utilize the PSP data to show that men who grew up with sisters continue to perform fewer household chores even in middle age, suggesting the persistent effect of childhood experiences. As we describe in the following section, these effects of having sisters for males in particular is consistent with existing research on family interactions. The gender stereotyping of the childhood environment thus may help to explain the effects that sisters have on male political attitudes.

Our results provide two unique contributions to the literature on political socialization. The first contribution is methodological. Our findings provide quasi-experimental evidence that childhood experiences can play an important role in shaping people's political preferences. Accordingly, our findings support a causal interpretation of earlier research. Second, our results provide evidence that socialization can happen in subtle and unexpected ways. The vast majority of the literature has argued that socialization causes children's views to resemble their parents' views. Our findings suggest that having sisters may influence men in such a way that

[3]Below, we sometimes use the more colloquial term "having sisters" to refer to our independent variable of interest.

[4]Recently, Urbatsch (2011) examined the effect of sibling gender using the 1994 General Social Survey (GSS), but he looked at older sibling gender and therefore did not analyze the data as a natural experiment. Unlike the PSP and the NLSY, the GSS is not a longitudinal study and does not have detailed household-register data collected during respondents' childhoods.

[5]The gender of the younger sibling may affect some parents' decisions about whether to have subsequent children, which would simply introduce heterogeneity and noise into the estimated treatment effects.

could actually tend to make them agree less with their sisters rather than more.

Gender Roles and Political Attitudes: Theory and Evidence

While most research on political socialization has focused on the effect that parents have on their children (however, see Tedin, Brady, and Vedlitz 1977), evidence from sociology and psychology indicates that siblings can often have just as big an impact (e.g., Smetana, Campione-Barr, and Metzger 2006).[6] This effect can occur through direct interactions between siblings or indirectly through the parents. With respect to the latter mechanism, previous research has found that having sisters has an important impact on how children, particularly boys, are raised.[7] For example, in assigning housework, daughters are more likely to be given tasks such as doing the dishes. As a result, boys are less likely to perform female-stereotyped tasks when they have sisters who get assigned those tasks (Gager, Cooney, and Call 1999; McHale et al. 1990; Raley 2006).[8] Conversely, if a male child has a brother, feminized housework will be split amongst the sons, and it will be less associated with "women's work." While these effects are present to some extent for female children as well, they are less pronounced because girls tend to be assigned feminized chores and shielded from masculine chores regardless of the gender composition of the household (e.g., Brody and Steelman 1985; Crouter, Manke, and McHale 1995). Evidence from the NLSY also accords with this pattern. Sibling gender has a substantial effect on the tasks assigned to boys but no significant effect on the types of chores that girls are asked to perform.

We hypothesize that experiencing more traditional gender roles in childhood will lead boys to adopt as adults a more conservative viewpoint with respect to gender roles. Lindsey (1997) posits that exposure to the structure of gender roles during childhood perpetuates into adulthood due to social learning. Children are socialized to adopt traditionally male and female behaviors via rewards and punishments within the household. Sociologists refer to these learned patterns of acculturation as "doing gender" (West and Zimmerman 1987).

We further hypothesize that experiencing a family environment with more traditional gender roles will cause males to be more likely to identify as Republicans given that traditional gender-role attitudes are positively correlated with political conservatism (Ciabattari 2001; Howell and Day 2000; Kaufmann 2002; Lye and Waldron 1997). For instance, Ciabattari (2001) shows that compared to men with egalitarian attitudes, those with traditional views on gender roles are 25% more politically conservative on the standard 7-point scale. In addition, the Democratic Party has recently been more supportive of measures to support gender equality and female participation in the workplace, while the Republican Party is often perceived as defending traditional family roles.[9] These differences between the parties have been highlighted by legislation such as the Family and Medical Leave Act of 1993 and the Lilly Ledbetter Fair Pay Act of 2009 that were adopted during times of unified Democratic control.

As a caveat, we note that the sociological evidence relating to gendered households and male protectionism uniquely apply to political and social attitudes related to the role of women in society. Our posited mechanism would not, for example, apply to men's empathy toward women more broadly (e.g., Brody and Hall 2010).

Data and Empirical Strategy

Description of Datasets

For the first set of analyses that follow, we use the four-wave PSP. The four waves were conducted in 1965, 1973, 1982, and 1997. In the first wave, most subjects were in their senior year of high school; 98.5% of the sample was between 17 and 19 years old. By 1997, most of the respondents were about 50 years old. The dataset

[6]In addition to affecting their siblings, children may influence the political views of their parents. Recent studies have found that child gender affects parental attitudes, particularly for fathers (e.g., Conley and Rauscher 2011; Glynn and Sen 2012; Oswald and Powdthavee 2010; Shafer and Malhotra 2011; Washington 2008). Most of this evidence finds that daughters lead parents to adopt more progressive attitudes, although Conley and Rauscher (2011) is an exception. They find that daughters make men more politically conservative, positing the mechanism that men's instincts to protect women lead them to be more paternalistic.

[7]It also appears that the gender of children can affect how well families function and the levels of trust that children develop (e.g., Morgan, Lye, and Condran 1988).

[8]Further, parents often encourage sex-typed activities and play among children, with boys given toys such as trains and toolkits and girls given dishes, dolls, houses, ovens, etc., reinforcing tasks that children are to perform later in life (Lytton and Romney 1991).

[9]Prior to the 1970s, the Republican Party was generally more supportive of women's rights (e.g., Sanbonmatsu 2004).

has detailed family information, including the gender and age of a respondent's siblings. These data thus provide the share of a respondent's siblings who are sisters and the quasi-random indicator for the younger sibling being a sister. Since our empirical strategy is based on the random assignment of younger sibling gender, our estimation sample consists of survey respondents who had at least one younger sibling.

We consider the effect of having sisters on people's preferences on gender roles and their partisanship. The phrasing of the gender-role question in 1973 was: "Recently, there has been a lot of talk about women's rights. Some people feel that women should have an equal role with men in running business, industry, and government. Others feel that women's place is in the home. Where would you place yourself on this scale or haven't you thought much about this?"[10]

Response options were represented by a scale ranging from 1 ("Women and men should have an equal role") to 7 ("Women's place is in the home"). Party identification was asked in the standard way following the question wording used in the American National Election Study (ANES). See online Appendix 1 for all question wordings and response options.

During the first two waves, data were also collected on a sample of the subjects' parents. We use these data to conduct randomization checks to confirm that having a younger sister (as compared to having a younger brother) does not predict pretreatment baseline characteristics for the PSP sample, as we would predict if younger sibling gender is randomly assigned.[11] These variables indeed are very similar for men (and women) with younger brothers compared to those with younger sisters (see online Appendix 2).[12] We chose variables that were entirely exogenous — either characteristics of the parents' own environments when they were children or other characteristics that could not be affected in any way by child gender. In these checks, as with all the regressions using these data, we cluster the standard errors at the primary sampling unit (PSU) level.

To evaluate the robustness of the results from the PSP, we also analyze a completely different dataset: the National Longitudinal Survey of Youth's Children and Young Adults sample (NLSY79-YA). The NLSY79-YA interviewed the children of the women of the original NLSY79 survey starting in 1986. Questions about gender-role attitudes and political partisanship were asked in the 2006 and 2008 waves, respectively, when respondents were between 21 and 38 years of age. Most of the respondents were on the young side of this range, with the median age for both female and male respondents being 22 in 2006. Most importantly, respondents were asked similar questions about partisanship and the role of women as were asked in the PSP. As a result, we can assess whether the main results from the PSP replicate using an entirely new sample surveyed in recent years. To measure views on gender roles, respondents were presented with the statement "A woman's place is in the home, not the office or shop" and were asked if they strongly disagree, disagree, agree, or strongly agree with it. In all analyses using the NLSY, we cluster standard errors by mother since sometimes more than one child in a household was interviewed.

Unlike the PSP, the NLSY also contains data on children's experiences in their early household environment. Starting at the age of 10, the same children who were later asked about their partisanship and political attitudes answered questions about the types of chores they did. As a result, we can use the NLSY to test for differences in the household assignment of tasks according to respondent gender, as well as differences according to sibling gender.

As with the PSP, we first conduct a series of randomization checks. We predict a set of pretreatment characteristics (e.g., mother's race, mother's number of siblings, grandmother's education, etc.). Since all these variables were determined before the younger sibling was born, if the gender of the younger sibling is randomly assigned, it should have no relationship with these variables. Having a younger sister indeed predicts none of these variables in the NLSY, both

[10]In 1982 and 1997, the question was phrased identically except for the addition of "and other people have opinions somewhere in between."

[11]There is some evidence that certain kinds of people are slightly more likely to have daughters than others. For example, families that have had two boys are approximately 2.3% less likely to have a girl for the third child than families that have had two girls (Rogers and Doughty 2001). These small differences cannot explain our results and would attenuate the effects that we do find if families that had more girls were generally more progressive with respect to gender roles.

[12]An omnibus test statistic indicates that, across the different pretreatment covariates, we fail to reject the hypothesis that respondents with younger sisters are identical to respondents with younger brothers ($p = .292$ for male respondents, $p = .634$ for female respondents; see Hansen and Bowers 2008). The data also indicate that Democratic parents in the sample were no more or less likely to have girls than Republican parents. If we regress parental partisan identification on a dummy variable for the next-youngest child being a girl, we estimate a near-zero coefficient ($p=.879$). See online Appendix 2 for complete details.

for male and female respondents (see online Appendix 2).[13]

Empirical Strategy

Given that we are analyzing a natural experiment, our main specifications are very simple. First, we compare men who have a sister as the next-youngest sibling to men who have a brother as the next-youngest sibling. Likewise, we compare women who have a younger sister to women who have a younger brother. Since we are interested in estimating the overall effect of growing up in an environment with more female siblings, we consider two possibilities that reasonably bracket the effect that siblings have on respondents' attitudes.

Assumption 1: All siblings have the same impact on attitudes.

Assumption 2: Any impact that siblings have on attitudes happens entirely through the immediately younger sibling with all other siblings having no effect.

Although we might expect the immediately younger sibling to be somewhat more important than other siblings who are much younger or much older, the sociological literature has posited that parents structure gender roles within the household based on the overall gender composition of children, not singling out adjacent children (see online Appendix 3 for complete details). Therefore, we think that the former assumption is more likely than the latter, but the important point for our purposes is that the truth is likely somewhere in the middle.

The estimate that we obtain under Assumption 1 (all siblings are equally important) represents the upper bound of the effect of growing up with sisters on political attitudes since it implicitly assumes that any sibling will have the same impact as the immediately younger one. The estimate of the effect of having sisters that we obtain under Assumption 2 (younger sibling is all that matters) represents a lower bound since it assigns an effect of zero to all siblings but the next-youngest one. By estimating specifications under each assumption, we thus bracket the true effect of growing up with sisters. As we show below, under both assumptions the estimated effects are statistically significant and substantively meaningful.

We first consider the model specification under Assumption 1. Define S_i to be the share of a respondent's siblings who are female. Where P_i is the respondent's gender role attitude or partisanship and $\mathbf{X}_i$ represents controls for family size (explained below), our specification is:

$$P_i = \beta_0 + \beta_1 S_i + a\mathbf{X}_i + u_i. \quad (1)$$

Here, the regression is not identified by ordinary least squares (OLS) since the share of a respondent's siblings who are sisters is endogenous for the reasons described earlier (e.g., stopping rules). However, under Assumption 1, all siblings have an impact only through the overall gender makeup of the household. Therefore, we have an ideal instrumental variable for S_i, namely a dummy variable indicating whether the younger sibling is female. This variable, which we call Z_i, is both randomly assigned and strongly correlated with the endogenous variable of interest in equation (1). It also satisfies the other requirements for a valid instrumental variable, as we describe in detail in online Appendix 3. Therefore, we estimate equation (1) using two-stage least squares (2SLS) as the estimation method.

Under Assumption 2, we simply need to regress a respondent's attitudes on a dummy variable for the younger sibling being female. Our regression equation is:

$$P_i = \beta_0 + \beta_1 Z_i + a\mathbf{X}_i + u_i. \quad (2)$$

Since we have an experimental environment, the regression is identified by OLS. In the equation, β_1 is the parameter of interest, representing the effect of having a younger sister on a respondent's gender roles attitude or partisanship.[14]

In the discussion that follows, we refer to equation (1) as the *instrumental variables* regression and equation (2) as the *reduced-form* regression. We obtain results that are nearly the same in terms of statistical significance under both specifications. For both dependent variables, we rescale respondents' answers to range from 0 to 1, with 1 representing the most conservative position.

The results remain essentially the same if we include additional control variables in the regressions. As emphasized earlier, the natural experiment of child gender should ensure that control variables are not necessary. Still, as a robustness check, we

[13]The omnibus test statistic fails to reject the hypothesis that the gender of the younger sibling is randomly assigned ($p = .436$ for male respondents, $p = .642$ for female respondents). In Figure S1 in the online appendix, we also include simple plots to illustrate that the balance statistics are what we would expect under random assignment (Rosenbaum 2010).

[14]For ease of interpretation and to avoid making additional modeling assumptions (Angrist and Pischke 2009), we use OLS as the estimation method. Results are nearly identical if an ordered logit (or standard logit for dichotomous items) is used instead.

estimated a range of specifications with controls for other pretreatment demographic variables. One particularly interesting covariate that we consider is parental attitudes, which we include to assess whether we are simply picking up parent-child transmission. The main results for each dataset remain almost exactly the same when control variables are included (see online Appendix 7).

Econometrics of Family Size

The share of a respondent's siblings who are sisters depends on family size in that the number of possible values for the sister-share variable increases when family size goes up. For example, the support of this variable for a respondent with only one sibling is {0, 1} whereas the support for a respondent with four siblings is {0, $^1/_4$, $^1/_2$, $^3/_4$, 1}. In this sense, the natural experiment is blocked within family size.

While the share of siblings who are sisters is not correlated in a linear way with the number of siblings a respondent has—the correlation coefficient is .002 in the PSP and .033 in the NLSY (see online Appendix 4)—we could be concerned that the effect of the independent variable is conditional on family size.[15] To ensure that the sister-share variable is not capturing effects that should actually be attributed to family size, we report specifications that control for the respondent's number of siblings (1) linearly and (2) nonlinearly with fixed effects for family size. In the fixed-effect regressions, due to the small number of very large families, we collapse cases where a respondent is in the top 3% for number of siblings into a single category. The estimates then reflect the average effect across the family sizes, weighted by the number of observations for each family size. The effects that sisters have on people's political attitudes remain essentially the same regardless of how we control for family size.

The Effect of Sisters on Political Attitudes

First-Stage Results

As described above, our empirical strategy exploits the quasi-random assignment of the indicator for the younger sibling being female. Earlier, we presented evidence that this variable is indeed randomly assigned by showing that respondents whose younger sibling was a sister were similar to respondents whose younger sibling was a brother on a host of pretreatment baseline characteristics. Not surprisingly, the first stage for the instrumental variables regression shows that the instrument is very strong (see Table S3 in the online appendix). In the PSP, regressing the share of a respondent's siblings who are female on a dummy variable for the next-youngest sibling being female gives a coefficient of .489 and a t-statistic of 24.1 ($p < .0001$).[16] In other words, a respondent's next sibling being a sister leads to a respondent having a share of female siblings that is 48.9 percentage points higher than if the next sibling was a brother. Specifically, respondents whose next sibling is a sister grow up with on average 73% of their siblings being female, whereas people whose next sibling is a brother grow up with on average 24% female siblings. We obtain a similarly strong first stage for the NLSY. We use this difference to identify the impact of growing up in an environment with more female siblings.

Attitudes on Gender Roles

To examine gender-role attitudes, we first analyze data from 1973, the year when respondents in the PSP first answered detailed questions about their views on the topic. As shown in the first column of Table 1 where we control for the number of siblings linearly, having more female siblings makes young men more conservative with respect to gender roles. The coefficient estimate of .171 ($p = .046$, two-tailed) indicates that compared to men with all brothers, growing up with all sisters shifted men's positions towards the conservative end of the gender-role scale by 17.1% of the 0–1 range of the dependent variable. This represents about a full category on the 7-point response scale. We obtain similar results when controlling for family size with fixed effects (see column 2).[17] We also find that having a younger sister makes men more conservative in their gender-role attitudes when estimating the reduced-form models under Assumption 2 (see columns 3 and 4). The effect sizes are 7.9–8.3%, about half the size of the estimates from the 2SLS regressions. As described

[15]Additional discussion of the econometrics of family size (as well as the distribution of siblings according to family size) appears in online Appendix 4.

[16]This t-statistic is larger than the rough threshold of 10 that puts instruments in the "safe zone" of avoiding bias (Angrist and Pischke 2009; Stock, Wright, and Yogo 2002).

[17]We collapse the highest fixed effect to represent respondents with seven or more siblings.

TABLE 1 The Effect of Having Sisters on Gender-Role Attitudes for the Political Socialization Panel

	1973 Gender-Role Attitude				1982 Gender-Role Attitude			
	IV Regression		Reduced Form		IV Regression		Reduced Form	
A. Attitudes in 1973 and 1982	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Male Respondents								
Effect of having sisters compared to brothers	.171 (.084) p =.046 N=279	.161 (.085) p =.062 N=279	.083 (.041) p =.045 N=279	.079 (.041) p =.061 N=279	.135 (.066) p =.043 N=285	.13 (.065) p =.05 N=285	.066 (.032) p =.04 N=285	.064 (.032) p =.047 N=285
Linear control for number of siblings?	Y	N	Y	N	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y	N	Y	N	Y
Female Respondents								
Effect of having sisters compared to brothers	-.054 (.083) p=.518 N=331	-.045 (.083) p=.587 N=331	-.027 (.041) p=.517 N=331	-.023 (.041) p=.586 N=331	-.077 (.065) p=.241 N=327	-.059 (.064) p=.358 N=327	-.038 (.032) p=.236 N=327	-.03 (.032) p=.354 N=327
Linear control for number of siblings?	Y	N	Y	N	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y	N	Y	N	Y

	1997 Gender-Role Attitude: Original Question				1997 Gender-Role Attitude: New Question			
	IV Regression		Reduced Form		IV Regression		Reduced Form	
B. Attitudes in 1997	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**
Male Respondents								
Effect of having sisters compared to brothers	.037 (.051) p =.462 N=281	.034 (.049) p =.491 N=281	.018 (.025) p =.459 N=281	.016 (.024) p =.488 N=281	.165 (.075) p =.031 N=284	.178 (.077) p =.024 N=284	.081 (.036) p =.028 N=284	.087 (.037) p =.021 N=284
Linear control for number of siblings?	Y	N	Y	N	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y	N	Y	N	Y
Female Respondents								
Effect of having sisters compared to brothers	-.067 (.057) p=.243 N=331	-.058 (.055) p=.299 N=331	-.033 (.028) p=.234 N=331	-.029 (.027) p=.293 N=331	-.147 (.08) p=.069 N=334	-.136 (.077) p=.081 N=334	-.072 (.039) p=.068 N=334	-.067 (.038) p=.082 N=334
Linear control for number of siblings?	Y	N	Y	N	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y	N	Y	N	Y

Note: The instrumental variable in each IV regression is a binary variable for whether the younger sibling is a sister (0=brother, 1=sister). Those regressions are estimated by 2SLS. The reduced form regressions are estimated by OLS with the binary variable for the younger sibling's gender as the independent variable. In regressions 1-12, the dependent variable is the respondent's gender role attitude in 1973, rescaled from 0 to 1, with 1 corresponding to the response that a "woman's place is in the home." In regressions 13-16, the dependent variable is the respondent's position on whether mothers should remain at home with young children (1=strongly agree). All standard errors (in parentheses) are corrected for clustering at the PSU level.

earlier, these OLS estimates represent lower bounds on the effect of having sisters on gender-role attitudes, while the 2SLS estimates are the upper bounds.[18]

At the same time, sibling gender has no effect on women's gender-role attitudes in 1973 as shown in the regressions for the female respondents. Women who grew up with sisters appear to be similarly conservative as women who grew up with brothers. We cannot reject the hypothesis of equality at any standard significance level ($p = .518$ in column one).

The effect of having sisters on males' gender-role attitudes for the standard question persists through 1982. As shown in the fifth column of Table 1, having sisters caused men to be 13.5% more conservative in 1982 on the same gender-role question that was asked in 1973 ($p = .043$). As shown in column 6, the results are robust to including family-size fixed effects.[19] We also obtain similar results in terms of statistical significance in the reduced-form regressions. Finally, we again find no effect of sisters for female respondents.

As shown in the bottom half of Table 1, by 1997 the effect of having sisters on men's opinions on the repeated gender-role question is no longer significant ($p = .462$). This diminished effect may be due in part to a change in the distribution of answers to the question caused by shifting norms on what constitutes a socially desirable response. By 1997, only one man out of 454 responded that "a woman's place is in the home" (a 7 on the 7-point scale), and 78.2% of respondents chose 1 or 2, the two options closest to "women should have an equal role with men in running business, industry, and government." In 1973, there was considerably more variation in responses. 7.6% of men chose the extreme "a woman's place is in the home" response option, and only 50.6% of respondents selected points 1 or 2.[20]

However, another question about gender roles was asked in 1997 where responses may be less subject to social desirability effects. For this question, we find a similar effect of having sisters on gender-role attitudes as we found in 1973 and 1982 for the other question. In 1997, respondents were asked the following question: "Mothers should remain at home with young children and not work outside the home. Do you agree or disagree?" "Agree" responses are indicative of more conservative viewpoints on gender roles, but they are less likely to be associated with explicit sexism than expressing the opinion that a woman's place is in the home. Respondents were asked to answer the question on a scale from 1 (strongly agree) to 5 (strongly disagree). There is much greater variation in men's responses to this question than the gender-role question repeated from 1973. For the five categories ("agree strongly," "agree somewhat," "neither agree nor disagree," "disagree somewhat," and "disagree strongly"), the percentages of men giving each answer were 9.2, 25.2, 16.8, 29.1, and 19.7, respectively. As shown in the bottom half of Table 1, for this new gender-role question, having sisters causes men to be 16.5 percentage points ($p = .031$) more conservative. These results are consistent across specifications; the reduced-form estimates are again about half the size of the 2SLS estimates. For this question in 1997, we also find a marginally significant effect of the opposite sign for female respondents. Since no similar effects emerge for female respondents on any other gender role questions or for partisanship, we think these results do no generalize.

Partisanship

Similarly, having sisters causes young men to be more likely to identify as Republicans. Table 2 presents the results for partisanship, where the 7-point measure is rescaled to range from 0 to 1, with 1 corresponding to being a strong Republican. The results suggest that having sisters affected partisanship for men only in early adulthood, in contrast to the more persistent effect that sisters have on men's gender-role attitudes. In 1965, male respondents with all sisters are 14.9 percentage points, or about one category on the 7-point partisanship scale, more likely to identify as Republicans in 1965

[18]Respondents were also asked where they would place other men on the scale. Having more sisters causes male respondents to perceive other men to be .137 units more conservative with respect to women's roles (p=.037), consistent with the false consensus effect where people project their own attitudes onto others (Ross, Greene, and House 1977). The findings are robust to including a complete set of family-size fixed effects. Once again, the reduced-form estimates are about half the size of the 2SLS estimates and nearly the same in terms of statistical significance. See online Appendix 5 for complete results.

[19]The effect is even larger for people's recollections of how they reported their gender roles opinions in the earlier survey. In 1982, men with sisters perceive themselves to have been 25.7% more conservative in 1973 than men with brothers. See online Appendix 5 for complete results.

[20]Indeed, the data provide little evidence that the preference ranking of people's opinions on this question actually changed from 1973 to 1997. If we run a Wilcoxon signed-ranks test comparing the preference ordering for the 1973 gender roles question to the preference ordering for the 1997 question, we get a p-value of 0.464 (N = 912).

TABLE 2 The Effect of Having Sisters on Partisanship for the Political Socialization Panel

	1965 Partisanship				1973 partisanship				1997 Partisanship			
	IV Regression		Reduced Form		IV Regression		Reduced Form		IV Regression		Reduced Form	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Male Respondents												
Effect of having sisters compared to brothers	.149 (.078)	.15 (.078)	.073 (.037)	.073 (.037)	.082 (.063)	.085 (.063)	.04 (.03)	.041 (.03)	.057 (.086)	.061 (.088)	.028 (.042)	.03 (.043)
	p =.06 N=282	p =.059 N=282	p =.053 N=282	p =.052 N=282	p =.195 N=286	p =.185 N=286	p =.189 N=286	p =.178 N=286	p =.508 N=281	p =.488 N=281	p =.507 N=281	p =.486 N=281
Linear control for number of siblings?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
Female Respondents												
Effect of having sisters compared to brothers	.031 (.075)	.021 (.072)	.015 (.037)	.01 (.036)	.038 (.067)	.035 (.066)	.019 (.033)	.018 (.033)	-.024 (.067)	-.025 (.066)	-.012 (.033)	-.013 (.033)
	p =.685 N=330	p =.77 N=330	p =.686 N=330	p =.771 N=330	p =.568 N=329	p =.594 N=329	p =.568 N=329	p =.594 N=329	p =.725 N=330	p =.702 N=330	p =.724 N=330	p =.701 N=330
Linear control for number of siblings?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y

Note: The instrumental variable in columns 1, 2, 5, 6, 9, and 10 is a binary variable for whether the younger sibling is a sister (0=brother, 1=sister). Those regressions are estimated by 2SLS. The regressions in columns 3, 4, 7, 8, 11, and 12 are estimated by OLS with the binary variable for the younger sibling's gender as the independent variable. In columns 1-4, the dependent variable is the respondent's partisanship in 1965 on a seven-point scale, rescaled from 0 to 1, with 1 corresponding to a strong Republican. The results in columns 5-8 refer to a respondent's partisanship in 1973, and the results in columns 9-12 refer to a respondent's partisanship in 1997. All standard errors (in parentheses) are corrected for clustering at the PSU level.

than respondents with all brothers ($p = .060$, column 1). The effect dissipates to 8.2 percentage points by 1973 ($p = .195$, column 5). The large p-value is a product of the relatively small PSP sample (and the small number of PSUs). This point estimate is similar to the strongly significant one we later find for partisanship in the larger NLSY sample that was collected from respondents who were also primarily in their early 20s. However, we are better able to distinguish the effect size from zero in the NLSY due to increased statistical power. In 1982 and 1997 for the PSP, the effect of sibling gender on partisanship continues to diminish so that the point estimate approaches zero in later years.[21] Sibling gender thus appears to affect men's party identification but only significantly so in the first wave of the data. Again, having sisters has no discernible effect on female respondents (see bottom panel of Table 2).

Household Chores

The 1997 wave also provides some indirect evidence on why the observed effects for gender-role attitudes and partisanship may occur. In 1997, respondents in the PSP were asked if they or their spouses did more of the household chores. Consistent with the idea that boys with sisters were asked to do fewer household chores and that such learned childhood behavior carries over into adulthood, men with sisters appear to do less household work, even in middle age. In these data, men with all sisters were 17 percentage points ($p = .063$) more likely to say that their spouse did more housework compared to men with all brothers, suggesting that the gendered environment from childhood may have permanently altered men's conception of gender roles and, consequently, their political opinions.[22] More detailed questions about chores conducted *during childhood* are found in the NLSY data, reported below.

All of the results remain largely the same when we include a series of control variables (see online Appendix 7). Likewise, we find suggestive evidence that having sisters makes men in the PSP more conservative on other issues in addition to gender roles (see online Appendix 8).

Gender Roles and Partisanship in the NLSY

We investigate here whether the results from the PSP replicate in a different sample that is a generation younger and was interviewed in a more gender-equal era. As shown in Table 3, we find that having sisters made men in the NLSY sample more likely to express conservative attitudes with respect to gender roles. The NLSY asked a similar gender-role question about whether a "woman's place is in the home" to the one asked in the PSP, but with four response options ranging from "strongly agree" to "strongly disagree," rather than a 7-point scale. We again rescale the answers to range from 0 to 1. As in the last wave of the PSP, there is relatively little variation in people's responses to this question. Of respondents, 88% disagreed or strongly disagreed. Even with the limited variation, the larger sample size in the NLSY makes it possible to detect an effect of having sisters on young men's views on this question. Compared to men with all brothers, men with all sisters were 3.9 percentage points more likely to agree with the statement that "a woman's place is in the home" ($p = .044$, column 1 of Table 3). We obtain similar results when including fixed effects for family size ($p = .054$, column 2).[23] As in the PSP, the reduced-form estimates are about half the size of the 2SLS estimates (columns 3 and 4). As shown in the bottom panel of Table 3, we did not observe significant effects for female respondents.

Likewise, as shown in Table 4, men with sisters are more likely to identify as Republicans. Having sisters made male respondents 5.9 percentage points more Republican ($p = .044$, column 1). We find a similar estimate in column 2, where we include family-size fixed effects. The reduced-form estimates are reported in columns 3 and 4. The p-values are similar across the different specifications. As shown in the lower half of Table 4, the corresponding effects of sisters on partisanship for female respondents are smaller and not statistically significant. Overall, the results are similar to those from the PSP for respondents of a similar age over 30 years earlier. Having sisters appears to make young men more likely to support traditional gender roles and more likely to identify as Republicans.

Household Chores in the NLSY

In addition to making replication of the PSP results possible, the NLSY child sample includes unusually detailed data on childhood experiences that provide evidence of one of the potential mechanisms underlying the results we identified in both datasets. As

[21]To conserve space, we only report the results from the 1997 wave in Table 2. The results for the 1982 wave are presented in online Appendix 6.

[22]See online Appendix 9 for complete results.

[23]Due to the limited number of large families in the NLSY, we collapse the highest fixed effect to represent respondents with six or more siblings.

TABLE 3 The Effect of Having Sisters on Gender-Role Attitudes for the National Longitudinal Survey of Youth (NLSY)

	IV Regression		Reduced Form	
	(1)	(2)	(3)	(4)
Male Respondents				
Effect of having sisters compared to brothers	.039	.038	.021	.02
	(.019)	(.02)	(.01)	(.011)
	p =.044	p =.054	p =.044	p =.054
	N=1940	N=1940	N=1940	N=1940
Linear control for number of siblings?	Y	N	Y	Y
Fixed effects for number of siblings?	N	Y	N	N
Female Respondents				
Effect of having sisters compared to brothers	.023	.027	.013	.015
	(.019)	(.019)	(.01)	(.01)
	p =.219	p =.161	p =.219	p =.161
	N=1979	N=1979	N=1979	N=1979
Linear control for number of siblings?	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y

Note: The instrumental variable in columns 1 and 2 is a binary variable for whether the younger sibling is a brother or sister (0=brother, 1=sister). Those regressions are estimated by 2SLS. The regressions in columns 3 and 4 are estimated by OLS with the binary variable for the younger sibling's gender as the independent variable. All standard errors (in parentheses) are corrected for clustering at the level of the mother. The dependent variable is the respondent's gender role attitude, rescaled from 0 to 1, with 1 corresponding to strongly agreeing that a "woman's place is in the home."

discussed earlier, sibling gender composition appears to affect the ways in which parents treat their children. Younger sisters have been found to make male siblings less likely to be assigned to female-stereotyped tasks. In the NLSY sample, this effect emerges in a striking way for boys.

First, we describe the gender differences in the assignment of household tasks. The NLSY asked about four chores in the supplemental data collected from children. We consider the answers given by the children in the sample from the first time the questions were asked in 1988 until the last time in 1996. For children who answer the questions in multiple years, we take the average answer given across the years so that our regressions are based on a single observation per respondent.[24]

Children who were 10 years of age or older were asked if they regularly helped with straightening out their room, keeping the rest of the house clean, doing the dishes, and cooking. Girls are more likely than boys to perform each of these tasks, but the differences are substantially larger for one variable than for the others: doing the dishes. Considering everyone in the sample who had a younger sibling, 60% of boys responded that they helped with the dishes, compared to 82.2% of girls ($p < .001$).[25] We also separately considered the results for children who were at least 12 years old because these were children's self-reports, and there is likely less measurement error in responses for children who are 12 and older than for the 10 and 11 year olds.[26] Boys with younger siblings who were at least 12 years old were 23.1% less likely to help with the dishes than girls who also had younger siblings and were at least 12 years old ($p < .001$).

Having identified a task that boys are less likely to perform than girls, we now consider how having sisters rather than brothers impacts whether a child performs the task. For the entire sample, we see that boys with all sisters are predicted to be 6.6% less

[24]We take the average of the younger sister variable across the years with chore data for each respondent. Only one respondent with chore data has a change in their younger sister variable from one chore response to the next. Results remain essentially identical if that respondent is dropped.

[25]The chore with the next-largest gender difference—cooking—had a gap of 13% between boys and girls.

[26]Since children filled out these questionnaires on their own, it is plausible that there would be more issues with accurate reporting for younger children. On the other hand, if there were reasons that children might choose to deliberately misreport their behavior, we might expect younger children to perhaps be less likely to engage in that behavior.

TABLE 4 The Effect of Having Sisters on Partisanship for the National Longitudinal Survey of Youth (NLSY)

	IV Regression		Reduced Form	
	(1)	(2)	(3)	(4)
Male Respondents				
Effect of having sisters compared to brothers	.059	.056	.031	.03
	(.029)	(.03)	(.016)	(.016)
	p =.044	p =.057	p =.044	p =.057
	N=1589	N=1589	N=1589	N=1589
Linear control for number of siblings?	Y	N	Y	Y
Fixed effects for number of siblings?	N	Y	N	N
Female Respondents				
Effect of having sisters compared to brothers	.011	.011	.006	.006
	(.027)	(.027)	(.015)	(.015)
	p =.674	p =.676	p =.674	p =.676
	N=1668	N=1668	N=1668	N=1668
Linear control for number of siblings?	Y	N	Y	N
Fixed effects for number of siblings?	N	Y	N	Y

Note: The instrumental variable in columns 1 and 2 is a binary variable for whether the younger sibling is a brother or sister (0=brother, 1=sister). Those regressions are estimated by 2SLS. The regressions in columns 3 and 4 are estimated by OLS with the binary variable for the younger sibling's gender as the independent variable. All standard errors (in parentheses) are corrected for clustering at the level of the mother. The dependent variable is a respondent's partisanship on a seven-point scale, rescaled from 0 to 1, with 1 corresponding to a strong Republican.

likely to do dishes than boys with all brothers (p = .09, column 1 of Table 5). If we consider only boys who were at least 12 years old when they answered the question, boys with sisters are 9.2% less likely to do dishes (p = .044, column 2). As shown in the third and fourth columns of Table 5, the effects are about half as large but still statistically significant in the reduced-form regressions.[27]

As was the case for the political questions in both the PSP and the NLSY, these effects occur only for the male respondents in the sample. Sisters have no discernible effect on whether females in the sample performed the female-stereotyped task, and the point estimates are close to zero (see bottom panel of Table 5).

The results provide clear evidence that male respondents in the NLSY had substantially different childhood experiences depending on whether they had sisters or brothers. For a task that girls were much more likely to do in childhood, males with sisters were much less likely to perform that task than males with brothers. The pattern in the data thus suggests a potential mechanism underlying our findings.[28]

Conclusion

In summary, we find that having sisters makes males more politically conservative in terms of gender-role attitudes and partisanship. Particularly for gender-role attitudes, we find that these effects persist into adulthood. Since sibling gender is randomly assigned, we can interpret our results as causal evidence that the household environment (cleaned of genetics, social forces, and other such omitted variables) influences political attitudes.

Our results provide a new perspective on the extant literature on political socialization in the household. Studies on parental influence generally have shown homogenization in that children's attitudes become aligned with their parents' beliefs.

[27]The regressions in Table 5 control for the number of siblings nonlinearly via fixed effects. We obtain similar results when including family size linearly (see online Appendix 9).

[28]If we regress a respondent's partisanship on the variable representing whether he or she helped out with the dishes, we find that performing the female-stereotyped task predicts that male respondents are more Democratic with no similar effect for female respondents. This result could, of course, be driven by the endogeneity of the assignment of household tasks.

TABLE 5 The Effect of Having Sisters on Task Assignment in Childhood for the National Longitudinal Survey of Youth (NLSY)

	IV Regression		Reduced Form	
	(1)	(2)	(3)	(4)
Male Respondents				
Effect of having sisters compared to brothers	-.066	-.092	-.036	-.051
	(.039)	(.046)	(.021)	(.025)
	p =.09	p =.044	p =.09	p =.044
	N=1503	N=1166	N=1503	N=1166
Restrict to children over 12 years old?	N	Y	N	Y
Female Respondents				
Effect of having sisters compared to brothers	-.027	.014	-.015	.008
	(.03)	(.032)	(.017)	(.018)
	p =.375	p =.656	p =.375	p =.656
	N=1544	N=1205	N=1544	N=1205
Restrict to children over 12 years old?	N	Y	N	Y

Note: The instrumental variable in columns 1 and 2 is a binary variable for whether the younger sibling is a brother or sister (0=brother, 1=sister). Those regressions are estimated by 2SLS with standard errors in parentheses. The regressions in columns 3 and 4 are estimated by OLS with the binary variable for the younger sibling's gender as the independent variable. Each regression also includes a set of fixed effects for the number of siblings. All standard errors (in parentheses) are corrected for clustering at the level of the mother. The depedent variable is a binary indicator for whether the child helps with the dishes.

However, our findings instead show how the childhood environment can push family members' attitudes in different ways, potentially leading to ideological heterogeneity within the household.

Further, this article has highlighted an often-ignored aspect of the household environment that can substantially affect political socialization. While an extensive amount of research has explored how attitudes are transmitted from parent to child, we show that siblings can influence each other as well. Recent research in education has underscored the importance of peers more broadly on educational outcomes (e.g., Calvo-Armengol, Patacchini, and Zenou 2009; Zimmerman 2003). Our results suggest that peers within the household may have similarly sized effects on political attitudes and identities.

By pointing towards the importance of the childhood environment, our quasi-experimental results support previous findings that experiences early in life play an important role in the development of political identity. Subsequent work can apply our general technique of looking for a quasi-experimental situation to revisit studies of the parent-child relationship in addition to other aspects of the childhood experience. Natural experiments have proved valuable for demonstrating effects that major life events and exposure to partisan media have on people's policy views (e.g., Della Vigna and Kaplan 2007; Erikson and Stoker 2011). These sorts of effects may be particularly important when children's political identities are being formed. As we have shown for sibling gender, natural experiments that isolate specific explanatory variables may help to identify important aspects of the complicated process of political socialization.

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