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Micro- and Macro-level Dynamics in Gender Attitudes in 1977-2012:
An Age-Period-Cohort Analysis*

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Abstract

A large body of research has traced the trajectory of historical change and cohort transition in gender attitudes, but it remains unclear to what extent these transformations are products of changes in micro-level characteristics or macro-level social shifts or net cohort and period transitions. We test these questions using cross-classified age-period-cohort models on data from the General Social Survey 1977-2012 (N = 39,351). Changes in individual education, demographic characteristics, marriage and family arrangements, religious practices, employment and income, and ideological orientations account for *more than 85 percent* of the cohort variations in gender attitude; they also account for *30 percent* of the period changes. Macro-level dynamics, historical transitions in female labor force participation and cycles of economy growth, account for another *half* of the variance in the period pattern. The size of the conservative swing in the 1990s remains unexplained by these models, so it could be interpreted as resulting from a rise of the "separate but equal" cultural gender scheme (Cotter et al. 2011).

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One of the most dramatic changes in Americans' attitudes in the last few decades is with regard to women's status in society. Since the late 1940s, change was already taking place in views on gender equality in the labor market (Spitze and Huber 1980) and acceptance of voting for a woman president (Ferree 1974). Since the 1960s, change also occurred in attitudes toward the division of domestic labor (Mason and Bumpass 1975; Mason et al. 1976; Spitze and Huber 1980; Thornton and Freedman 1979). American public opinions show a steady trend of rising gender egalitarianism (Cherlin and Walters 1981, Tallichet and Willits 1986, Brewster Padavic 2000, Brooks and Bolzendahl 2004). This change has been "large and generally monotonic" (Brooks and Bolzendahl 2004) and American's gender attitudes have become "significantly more liberal during the past half century" (Peltola et al 2004).

This historical trajectory toward egalitarian gender attitudes leveled off and experienced a reversal since the late 1990s (Brewster and Padavic 2000, Thornton and Young-DeMarco 2001, Cotter et al 2011). This shift is broad based, influencing both men and women, all ethnicities, all birth cohorts, and all levels of education and income (Cotter et al. 2011). The most current research exploring the sources of this transition failed to identify any structural changes or demographic transformation as an explanation (Cotter et al. 2011).

In this paper, we make two improvements to this research. First, we analyze both micro- and macro-level influences to consider structural changes that impact individuals both directly in their experiences and indirectly through exposure to the larger environment. Existing research

has analyzed a large number of individual characteristics measuring respondents' direct life experiences with agents of change, such as education, personal employment and proximity to working women, presence of young children, etc. These studies have also analyzed changes in the composition of individuals with these characteristics across time and cohorts as sources of shifts in gender values. However, they have not considered changes in the broad social conditions that impact the entire population simultaneously through bringing about historical changes over time. These broad changes may include the steady rise in female labor force participation since the 1960s and stagnation in the late 1980s and early 1990s, preceding a similar change in gender attitudes. These broad changes may also include the economic downturn in the late 1980s and early 1990s, the boom in the late 1990s, and the recession since the 2008. These large-scale social and economic conditions changed people's outlooks toward employment and family as well as their attitudes toward women's roles and status in society. Our analysis incorporates historical changes in the rates of female labor force participation and GDP growth as macro-level influences on gender attitudes.

Second, we analyze the cohort and period effects while controlling for the effect of age, using a new model that enables us to consider all three influences simultaneously. Due to modeling limitations, research on cohort and period variations in gender attitudes has been unable to consider age because age, period and cohort form a perfect linear relationship and cannot be used in an estimation model at the same time. Most researchers have had to leave age out of their model, thus resorting to flawed estimations of the period and cohort influences (Yang and Land 2006, 2008). This omission of age leads to erroneous estimation of both the cohort and

period effects, particularly an overestimation of the cohort effects for the younger and older cohorts, and an underestimation of the period effect for the early and later survey years.

We analyze sources of cohort and period variations in gender attitudes in the last three decades. We ask to what extent these transitions are products of changes in micro-level characteristics or macro-level social shifts or net cohort and period transitions. We test these questions using cross-classified age-period-cohort models on eighteen waves of data from the General Social Survey 1977-2012 (N = 39,720).

LITERATURE REVIEW

Cohort and period influences have been powerful influences on changes in gender attitudes. They transform population attitudes through micro-level individual characteristics and macro-level broad societal transitions.

Cohort- and Period- Processes as Contextual Influences

Studies have analyzed cohort and historical changes in gender attitudes at the aggregate level (Brooks and Bolzendahl 2003; Brewster and Padavic 2000; Farley 1995; Rindfuss, Brewster and Kavee 1996; Wilkie 1993; Mason and Lu 1988; Thornton, Alwin and Camburn 1983). Historical period, birth cohort, and social context indicative of broad socialization experiences influence individual attitude formation (Davis and Greenstein 2009). New ideas about women's status and gender relations disseminate through social learning and influence, via psychological processes within individuals' social networks. Through interactions with others in their networks, people tend to receive information biased toward their associates' beliefs and are

rewarded for adopting similar beliefs (Sprague 1982). Social contexts differ substantially by birth cohorts and historical times.

Inter-cohort transition and cross-time transformation are seen as "macrolevel dynamics underlying societal trends toward more egalitarian attitudes" (Brewster and Padavic 2000). Attitude transformation can result from changes in individual attitudes in the population from one historical period to another, or from changed population membership through the demographic process of birth and death, and both of these mechanisms significantly affect the process of change in gender attitudes (Davis and Greenstein 2009).

Period effects on gender attitude are most likely due to historical events or social changes that influence the entire population simultaneously (Brewster and Padavic 2000; Mason and Lu 1988). People exposed to the same historical event or social transformation may experience similar changes in value orientations. Period effects were implicit in the shift toward more egalitarianism regarding American women's familial roles in 1977-85, which can be attributed to women's influx into the labor force (Mason and Lu 1988). Both sexes held more egalitarian gender attitudes in the 1990s than they had before (Bolzendahl and Myers 2004). Period effects can also manifest through changes in individual predictors over time. Period effects can vary between men and women: in the case of Americans' gender ideology, the change in men's attitudes was slower than the change in women's attitudes after the 1970s (Ciabattari 2001).

The other macrolevel dynamic is the demographic process of cohort replacement. Birth cohorts encounter different social, economic, and political events during their formative years (Mannheim 1952; Ryder 1965), so they differ in attitudes, beliefs and values due to their unique socialization experiences. Attitude change unfolds through a "demographic metabolism" (Ryder

1965). Once formed, attitudes tend to crystallize as individuals integrate into social institutions such as work and family (Glenn 1980). Cohorts are replaced by younger cohorts raised in different social and economic contexts, and the new cohorts usher in social change (Ryder 1965). U.S. research found that cohort succession was significant in the shift toward egalitarian gender attitudes, more liberal family beliefs, and more permissive sexual outlooks (Bolzendahl and Myers 2004; Brewster and Padavic 2000; Mason and Lu 1988).

Sources of Period and Cohort Changes: Micro-Level Changes

Individuals' direct experiences shape their value orientations. Experiences in educational institutions, family life, and the labor market mold people's perceptions about women's rights and status in society. As the population composition on these characteristics changes, these micro-level influences lead to transformations between cohorts and over historical time.

Education. Better-educated individuals tend to have more egalitarian gender attitudes. Education—particularly college education for women—has the strongest effect on gender attitudes, resulting in college-educated women having the most egalitarian attitudes (Mason et al. 1976; Spitze and Huber 1980; Thornton et al. 1983; Thornton and Freedman 1979). The rising number of college-educated women over time and in the younger cohorts leads to more egalitarian attitudes.

Family Structure. Unmarried people with children tend to hold more liberal gender attitudes than their married counterparts (Cotter et al 2011). The rising level of education in the younger cohorts (Fischer and Hout 2006) as well as the increasing share of people living in

nontraditional families (Lichter and Qian 2005) account for some of the cohort and period

variations in gender attitudes.

      Women's Employment. Women who work in paid employment tend to hold more

egalitarian gender role attitudes (Wilcox and Jelen 1991; Cassidy and Warren 1996). The

increasing number of working women accounts for another portion of the cohort and period

variations in gender attitudes.

      Religion and Conservatism. People who adhere to fundamentalist and evangelical

religions and attend religious services more frequently are less likely to endorse an egalitarian

gender ideology (Peek, Lowe, and Williams 1991; Hoffmann and Miller 1997; Moore and

Vanneman 2003; Bolzendahl and Brooks 2005). Conservative orientations toward civil liberties,

civil rights, and sexual tolerance are associated with less egalitarian gender attitudes (Brooks and

Bolzendahl 2004, Cotter et al 2011).

Sources of Period and Cohort Changes: Macro-Level Transformations

      People exposed to the same historical event or social transformation may experience

similar changes in value orientations. New ideas about women's status and gender relations

disseminate through social learning and influence, via psychological processes within

individuals' social networks. Through interactions with others in their networks, people tend to

receive information biased toward their associates' beliefs and are rewarded for adopting similar

beliefs (Sprague 1982). Social contexts differ substantially by birth cohorts and historical times.

      Female Labor Force Participation Rate. Broad historical transformations have impacts

not only on those who directly experience these changes but also on those who are proximate to

these changes. Paid employment not only fosters egalitarianism in women, but also in their

husbands and children (Smith-Lovin & Tickamayer 1978; Smith 1985; Powell & Steelman 1982). Women who themselves are working hold more liberal gender attitudes; those who work with them may also start to accept women's work as normative; and these women's spouses, children and friends may also adopt more egalitarian gender attitudes (Fan and Marini 2000). Period effect was implicit in the shift toward more egalitarianism regarding American women's familial roles in 1977-85, which can be attributed to women's influx into the labor force (Mason and Lu 1988). Female labor force participation rate projected an almost a linear increase until the late 1980s, when it stagnated until the mid-1990s (Bureau of Labor Statistics 2013). Married mother's employment, after experiencing a steady increase, slowed down in the late 1980s to early 1990s, and stopped increasing in late 1990s (Cotter et al 2004). The leveling off of women's employment that took place in the late 1980s preceded a sharp conservative turn in gender attitude in the mid-1990s (Cotter et al 2011).

Economic Growth. Cross-national studies show that people in high-GDP countries are less supportive of maternal employment (Shu 2012). Perhaps women in rich societies have been promoted and can afford to "indulge in" their "gendered selves" as evidenced by their high rates of specializing in "female" typed fields of study or profession, or devoting themselves to their maternal roles more than women in less wealthy countries (Charles and Bradley 2009; Charles and Grusky 2004). During the economic boom in the late 1990s, younger cohorts of female executives were more likely to embrace the idea of family devotion than their older counterparts (Blair-Loy 2001). A period of high economic growth fosters optimistic outlooks and makes female employment less necessary for survival purposes, and affords women more "liberty" to indulge in their "feminine" selves when mothering expectations are high and state policies

discourage institutional childcare. Economic growth may also influence people's perception of

women's employment through working hours and their impact on family life. Working hours

have experiences large rises in the 1990s among married men and women (Hout and Hanley

2002). This decade saw the combined work hours of husbands and wives in families with

children increase by 4 hours, while those without children increased by 3 hours (Hout and

Hanley 2002). The "overworked" families may reconsider their time allocation between paid

employment and domestic work and childcare, and some may conclude that a traditional division

of labor with men specializing in paid employment and women in domestic work may be the

solution.

DATA, MEASURES AND MODEL

We used data from eighteen waves of the General Social Survey from 1977-2012 (Smith,

Marsden, Hout, and Kim, 2013). Similar to earlier analyses (Cotter et al., 2011), we examined

four questions about gender roles that were asked in 1977, 1985-1986, and 1988-2012. We also

use a data set on GDP growth rate and female labor force participation at year-level for each of

the eighteen survey years. We compiled these measures from the World Bank (2013) and the

U.S. Bureau of Labor Statistics (2013).

Gender Attitudes

The four items on gender attitudes asked respondents if they agreed or disagreed with the

following statements: "A working mother can establish just as warm and secure a relationship

with her children as a mother who does not work" (FECHLD); "It is much better for everyone

involved if the man is the achiever outside the home and the woman takes care of the home and family" (FEFAM); "A preschool child is likely to suffer if his or her mother works" (FEPRESCH); and "Most men are better suited emotionally for politics than are most women" (FEPOL). We constructed a scale using these four items (Cotter et al., 2011). The scale was constructed using the mean of the standardized scores for each item (Cronbach's $\alpha = 0.70$). The GSS contains an additional four questions about gender roles, but we excluded these from our analysis because they stopped appearing on surveys after 1998 and thus failed to capture recent attitudinal trends.

We divided the sample into five generations according to prior research on the distinctive characteristics and life experiences of age groups in the United States (Strauss and Howe 1991, Pew Research Center 2010). Members of *the Greatest Generation* (also the *G.I. Generation*) were born in 1901-27, coming of age during the Great Depression, and many served in the Second World War. *The Silent Generation* was born in 1927-45. They are generally recognized as the children of the Great Depression, and their label refers to their conformist instincts (Pew Research Center 2010). The *Baby Boomers* were born after World War II in 1946-64, and gained their namesake from the high birth rates of the time. Baby boomers are associated with a rejection or redefinition of traditional values (Jones 1980). *Generation X* was born in 1965-80 and used to be called the Baby Bust. *The Millennial Generation* was born after 1980 and was the first generation to come of age in the new millennium (Pew Research Center 2010). Since each generation is associated with a span of 25 years or more, we further classify these five generations into fourteen cohort groups, with each containing approximately a span of five years. These are three cohorts of the Greatest Generation: I 1900-09, II 1910-18, and III 1919-27; three

cohorts of the Silent Generation: I 1928-33, II 1934-39, and III 1940-45; three cohorts of the

Baby Boomers: I 1946-51, II 1952-58, and III 1959-64; three cohorts of the Generation X: I

1965-69, II 1970-74, and III 1975-80; two cohorts of the Millennial Generation: I 1981-87 and II

1988-94. Demographic research has commonly created cohorts by mechanically dividing the

sample into five-year intervals, but this practice may separate members of the same birth cohort

who share similar experiences (Yang 2008). Instead, we divided the cohorts around historical

events that were likely to create distinctive experiences for respondents during their formative

years.

We included several demographic variables which have been linked to gender role

attitudes in previous research (Cotter et al. 2011; Mason and Lu 1988). The respondent's age was

calculated by subtracting their birth year from the survey year. The respondent's gender was

represented by a dichotomous variable. The highest completed year of formal education was

calculated for respondents, their spouses, and their parents. Many respondents were missing data

on their parents' education, so we identified the missing cases with a dummy variable and used

mean substitution for the missing values. If the respondent was married, a dichotomous variable

indicated whether the wife (either the female respondent or the spouse of a male respondent) had

more education; all other cases were 0.

The race of the respondent was represented by four dummy variables for non-Hispanic

white, non-Hispanic black, Asian, and Hispanic. We categorized marital and parental status as

four mutually exclusive, dichotomous variables: currently married with children under 18 at

home, currently married with no children at home, not currently married with children at home,

and not currently married with no children at home. The reference category was married with

children. The number of young children (0-6 years old), preteens (6-12 years old) and teenagers (13-17 years old) in the household were included in the model.

The model included several measures of employment for the respondent and his or her spouse, if applicable. To understand the relationship between women's labor force participation and gender attitudes, we included employment measures for female respondents and the spouses of male respondents. We included a dummy variable to measure whether the woman was in the labor force, and we also included a dummy variable for full-time employment (all other women and men were coded 0). The managerial-professional status of both men and women were included as dummy variables (professional or managerial = 1, all others = 0). In order to estimate family income, we calculated the logged constant dollar midpoints from the categories represented in the GSS data.

Religious affiliation was measured by a set of seven dichotomous variables (Steensland et al. 2000). The frequency of church attendance was also included as an ordinal measure of religious participation. Self-reports of respondents' political conservatism and liberalism were included as a seven-point scale, with -3 indicating extreme liberalism, 0 indicating moderate views, and 3 indicating extreme conservatism. We also included a measure of liberal rights ideology to see how changes in gender attitudes were related to broader ideological changes. Following Brooks and Bolzendahl (2004) and Cotter et al. (2011), we constructed a scale using standardized measures of attitudes on civil rights, civil liberties, and sexual tolerance (Cronbach's $\alpha = 0.92$). The scale included eighteen items measuring respondents' attitudes about

which rights should be afforded to atheists, racists, communists, militarists, and homosexuals, as well as the morality of sex education, premarital sex, and homosexuality.[1]

Several variables were structurally missing in the sample; for example, unmarried respondents had no data for spouse's education and employment. In these cases, we coded the responses as 0 and marked them with a dummy variable. Spouse's education still had substantial missing data after correcting for structurally missing data, so we marked these missing data with another dummy variable and imputed the missing values using an OLS regression.[2] The means and standard deviations for all the variables used in our analyses are in Table A1 in the Appendix.

We used two variables to measure historical dynamics for each of the survey years. We included the annual GDP growth rate to explore the relationship between macro-economic trends and changes in gender attitudes. This measure was compiled from the World Bank (2013), and we lagged it by two years to allow the effect to take place. We also included a measure of female labor force participation in order to understand the influence of women's employment on attitudes about gender. We used a measure calculated by the Bureau of Labor Statistics (2013) of the percent of females in the civilian non-institutional population aged 16 years and over in the labor force. We also lagged this measure by two years.

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[1] The liberal rights ideology scale created by Brooks and Bolzendahl (2004) also included a measure of racial attitudes. Similar to Cotter et al. (2011), we excluded this measure from the scale because it has not appeared on the GSS since 2000.

[2] Spouse's education (in years) was regressed on spouse's highest degree, spouse's employment status, respondent's sex, and respondent's education. Unfortunately, the GSS does not contain additional spousal data, but this imputation technique is nevertheless superior to simple mean substitution (Cotter et al., 2011).

Multilevel Cross-classified Age-Period-Cohort Models

Our repeated cross-sections from the General Social Survey data include individuals who are nested within cells created by the cross-classification of two types of social contexts: birth cohorts and survey years. Table 1 displays this data structure. The 39,531 respondents were nested within fourteen cohorts and eighteen survey years. In recognition of this data characteristic, we formulated a multilevel cross-classified model, which overcomes the methodological difficulties in traditional age, period, and cohort models (hence APC models). Because age, period, and cohort have a perfect linear relation: period = age + cohort, it is impossible to estimate a linear model with all three variables together. A cross-classified APC model allows us to simultaneously analyze the effects of age, period, and cohort on gender attitudes, and provides improved estimation of individual effects (Yang and Land 2006, 2008; Yang 2006).

[TABLE 1 ABOUT HERE]

This model has two components: the "within-cell" and the "between-cell." The "within-cell" or individual model can be expressed as the following:

$$y_{ijk} = \pi_{0jk} + \pi_{1jk} Age_{ijk} + \sum \pi_{mjk} GenRace_{ijk} + \sum \pi_{pjk} Structure_{ijk} + \sum \pi_{qjk} FLP + \sum \pi_{sjk} Ideo \tag{1.0}$$

where y_{ijk} is the gender attitude scale score for individual i in birth cohort j and survey year k, π_{0jk} is the intercept, $\pi_{1jk}, \pi_{mjk}, \pi_{pjk}, \pi_{qjk}$ *and* π_{sjk} are regression coefficients for individual-level predictors for individual i in birth cohort j and survey year k including age, a series of measures

of gender and race, a series of measures of social structural changes, a series of measures of women's female labor force participation, and measures of ideological orientation.

The micro component of individual attitudes varies by cohort and historical period. We specify the "between-cell" model as random-effects. The intercept π_{0jk} in Equation (1) is expressed as:

$$\pi_{0jk} = \theta_0 + \sigma_0 + \lambda_0 \tag{2.1A}$$

where θ_0 is the model intercept, the expected value of π_{0jk} when all explanatory variables are set to zero, σ_0 and λ_0 are residuals or random effects of cohort and survey year, respectively.

All other regression coefficients in Equation (A1) are expressed as:

$$\pi_{pjk} = \theta_p \tag{2.2}$$

where p = 1, 2,…, and θ_p is the regression coefficient of each individual-level explanatory variables which does not vary by cohorts or periods, cell-level explanatory variables. We estimated these models using HLM 7.0 (Raudenbush and Bryk 2002).

It is also appropriate to treat cohort and survey years as unique entities, estimating these as fixed effects (Yang and Land 2008, p. 321). This provides us with explicit t-test scores for evaluating statistical significance. We thus specify the "between-cell" model as fixed-effects. The intercept π_{0jk} in Equation (1.0) is expressed as:

$$\pi_{0jk} = \theta_0 + \beta_{0j} \sum_{j=1}^{14} Cohort_j + \gamma_{0j} \sum_k SurveyYear_k \tag{2.1B}$$

where θ_0 is the model intercept, the expected value of π_{0jk} when all explanatory variables are set to zero, and β_{0j} and γ_0 are the fixed effects of the dummy variables representing birth cohorts and survey year, which are estimated by the incorporation of two sets of dummy variables for *J-1* cohorts (13 cohorts) and *K-1* periods (17 survey years).

After we estimated a series of cross-classified random-effect models and cross-classified

fixed-effect models, we carried out Hausman tests (Wu 1973; Hausman 1978; Yang and Land

2008, p313) which is a Wald Chi-squared test: $W = \chi^2[K] = [\hat{B}_F - \hat{B}_R]^T [Var\hat{B}_F - Var\hat{B}_R]^{-1}[\hat{\beta}_F - \hat{\beta}_R]$,

where $\hat{B}_F$ is the vector of individual-level regression coefficients estimated from the CCFEM

model using Equation (2.1A), $\hat{B}_R$ is the vector of regression coefficients estimated from the

CCREM model using Equation (2.1B), and $[Var\hat{\beta}_F - Var\hat{\beta}_R]$ is the difference of the variance-

covariance matrices of the two estimators. W is a chi-squared distribution with K degrees of

freedom, where K is the dimensions of the $\hat{B}_F$ and $\hat{B}_R$ vectors. All Hausman tests show P > .001,

as our large sample sizes result in very small standard errors (N = 39,531). We fail to reject the

null hypothesis that there are no systematic differences in the coefficient vectors estimated by

CCFEM and CCREM. Both sets of estimates from CCFEM and CCFEM are consistent.

Because our main purpose is to estimate whether there are statistically significant cohort

and period variations, results from the CCFEM afford us with statistical tests that can inform us

whether there are between-cohort or between-period variations. With small sample sizes in some

of the cells, we run substantial risk in underestimating cohort and period variances and standard

errors while such risk is minor in estimating standard errors of fixed effects (Yang, 2006). The

assumption of random effect models that the independent variables are randomly selected from a

population and are normally distributed around a zero mean is unlikely to hold. We thus provide

CCFEM estimates in the graphs and CCREM results in a table for comparison.

ANALYSIS

We move forward in our analysis in three steps. We first graph period and generation variations in gender attitudes. We then graph age and generation variations in these attitudes. We last estimate a series of multilevel cross-classified age-cohort-period models to unravel micro-, macro-level influences as well as age, cohort and period variations.

Generation and Period Variations in Gender Attitudes

The trajectory of change in gender attitudes in 1977-2012 shows both period- and cohort-related changes. These are in Graph 1A. In the upper left panel, attitudes on "women not suited for politics" experienced substantial change toward the egalitarian direction from 1977 until 1994, when the change reversed for 10 years until 2004, and then it picked up again. This pattern is consistent across all five generations. There have been successively liberal changes between the three older generations, the Greatest, the Silent and the Boomers, with each younger generation holding more egalitarian attitudes. However, the two youngest generations, the Gen X and the Millennials, have reversed this liberal trend, holding attitudes as traditional or even more traditional than the Boomers. The change in attitudes toward "Mother working does not hurt children" in the upper right panel shows a similar pattern, with the attitudes reaching a height in 1994, then plummeting until 2000, and rebounding in later years. Again, the two youngest generations halted the liberal inter-generational trend toward more liberal attitudes, with their attitudes more similar to the Boomers. Attitudes toward "Preschool kids suffer if mother works" show a similar pattern, with the level dipping in the mid-1990s and rebounding at 2000. The two youngest generations appear to be slightly more liberal than the Boomers. Lastly,

the attitudes on "Better for man to work, woman tend home" had a slightly different pattern. Liberal attitudes peaked in the mid-1990s for all generations and rebounded after 2000 among the two oldest generations, although it has not recovered to the highest level. For the three youngest generations, the decline continued and stagnated until 2012. Again, the two youngest generations did not show upward change relative to the Boomers. These graphs show that it is likely that the two youngest generations have more conservative attitudes than the Boomers, given the data showing that they have similar attitudes in the same survey years, despite the age differences. As people tend to become more traditional when they age, it is possible the Generation X and the Millennial Generation are more conservative than the Boomers at the same age.

[GRAPH 1A ABOUT HERE]

We next inspect the general trend in value transition in 1977-2012 over the generations and generation dynamics in Graph 1B. When considering gender attitudes as one single construct, it demonstrated the same pattern we evaluated in Graph 1A. The left panel shows that gender attitudes peaked in the mid-1990s and declined until 2000, then rebounded to almost the highest historical level. The two youngest generations did not continue with the liberal trend, registering similar levels of attitudes as the Boomers. When considering the large-scale population-level transformation, change in population composition is an important force driving the cultural shift. This population metabolism, as shown in the left panel, shows that the Baby Boomers account for a substantial proportion (more than 40%) of the samples in 1982-98. Their share fell below 40% after 2000 and has since declined. The two youngest generations reached 20% in 1996 and accounted for 50% of the population in 2012. The two oldest generations

declined from 50% of the population in 1977 to 40% in the mid-1990s and to only 20% in 2012.

This population replacement process generally maintains a liberal trend of attitudinal change, as the two oldest generations shrink and are replaced by the two newest generations. However, this liberal trend will be slow and even stagnate because the two youngest generations are no more nontraditional than the Boomers.

[GRAPH 1B ABOUT HERE]

Generation and Age Variations in Gender Attitudes

Changes over the calendar years can also be the product of aging process, as individuals enter into adult social roles and experiences and adjust their orientations. Graph 2A illustrates changes in gender attitudes by age for each generation separately. In the upper left panel on "women not suited for politics," the three oldest generations show an upward trend over the life course, although the Silent Generation also goes through a downward movement in their 70s. The two youngest generations show neither upward nor downward changes with age. Although the two youngest generations start at levels higher than the Boomers, they are now at levels similar to the Boomers, now that they are in their mid-40s and 30s, respectively. This upward trend should not be interpreted as an aging effect, as they may also reflect an upward period effect as individuals of all ages and generations become more egalitarian. The upper right panel shows the attitude on "preschool kids suffer if mother works." With the exception of the three young generations that show an upward change during their teens and earlier twenties, all generations do not demonstrate patterns of change related to the passage of time. This again should not be interpreted as minimal age-based changes; rather, an upward historical pattern can

20

cancel out a downward life course pattern. The other measure on attitudes toward working mothers is in the left bottom panel, on "mother working doesn't hurt children," does not show any movement either. Again, this pattern could be the result of opposing life course changes and historical changes. Lastly, the bottom right panel shows the attitudes toward "better for man to work, woman tend home." Except for the youngest generation who has too short of a trajectory to reach a decline, all of the other generations show a decline over time. This is indicative of a decline with age.

[GRAPH 2A ABOUT HERE]

We last evaluate age and generation variations on the single construct of gender attitudes in Graph 2B. It has the same pattern as two of the graphs we analyzed earlier. For all five generations, there is little change with age in levels of gender attitudes, except for two generations whose attitudes experienced upward movement in their twenties for the Boomers and late 30s among the Silent Generation. Although the two youngest generations started with more egalitarian attitudes than the Boomers in their teens and early twenties, all three generations were at the same level because the Boomers raised their attitudes in their twenties sharply toward the liberal direction. These generational gaps among the three older generations maintain the same size over the life course. Since it is impossible to untangle the joint effects of aging, historical times, and cohort, we need to use statistical models to unravel these influences.

[Graph 2B ABOUT HERE]

Cohort and Period Effects in Cross-classified APC Models

We estimated a series of multilevel cross-classified APC models to estimate the effects of cohort, period, age, and other predictors of gender attitudes. The coefficients are in Table 2. In Model A, we included only cohort and period as random effects at column- and row-level, respectively. In Model B, we added age as an individual-level variable. In Model C, we included measures of gender and race. In Model D, we included measures of social structural changes. In Model E, we expanded to include measures of women's labor force participation. Lastly in Model F, we completed the analysis with measures of political ideology. In the first APC model without any other predictors in Model B, age was negatively associated with egalitarian gender attitudes. Period and cohort effects accounted for 7.6% of the variance in gender attitudes (4.5% for period and 3.1% for cohort) while 92% of the variance was at the individual level. Race and gender characteristics accounted for 4% of individual-level variances in Model C, while cohort and period variances remained unchanged. In Model D, social structural characteristics of marital and parental status, number of children, education, parental education, religious affiliation and attendance, family income, and man's occupational prestige accounted for 12.2% of the individual-level variance, as well as 57.2% of the cohort-level variance. Model E had measures of women's labor force participation and it explained 14.4% of the variance at period level and 73.7% of the variance at cohort level, as well as 1.39% of the individual-level variance. Lastly in Model F, measures of ideology pushed the percentage of variances accounted for by period to 31.8 and by cohort to 86.7. A great majority of the cohort variance was a result of the cohorts' different locations in the social structure, patterns of women's labor force participation, and ideological orientations. Historical changes in these

characteristics of the population have also played a role in bringing about changes in gender

attitudes, but to a lesser extent.

[TABLE 2 ABOUT HERE]

To visualize the changes in cohort and period effects in these models, we show the size of

cohort and period random effects in Graphs 3A & B. These graphs are based on an identical

scale, so we can evaluate changes in the size of the variances by the height of the bars. In Model

A, with no individual-level variables in the model, the top-left most graph shows large amount of

variance and declining negative cohort effects among the first seven cohorts and the same

amount of positive cohort effects among the younger seven cohorts. With the effect of age

controlled for in Model B, the top middle panel shows that the size of the cohort effects is much

smaller, with the first eight cohorts having a successive pattern of ranging from largely negative

to largely positive effects. These positive cohort effects start to decline among the youngest

Boomers and become smaller in each of the younger cohorts. In Model C with gender and race

added, the cohort effect remains unchanged. In Model D with social structure measures

included, the size of the cohort effect is much smaller, but the general pattern persists of moving

from negative to positive effects among the older cohorts and declining back to negative effects

among the youngest cohort. In Models E and F, the sizes of the cohort effects are further

reduced, although the same inter-cohort pattern continues. The total between-cohort variance

unexplained by Model F is less than 13%.

[GRAPHS 3A & 3B ABOUT HERE]

The reduction in period variances is less dramatic in Graph 3B. Model A shows that the

gender attitudes continue the liberal trend and peak in 1993-4, decline until 2000, and rebound

back to slightly lower than the peak. After controlling for age in Model B, this same period

pattern persists, although the size of the change appears to be enlarged. With gender and race

included in Model C, this same pattern persists. When measures of social structural changes are

added in Model D, the same general pattern still exists, but the swing appears to be cyclical.

There is a general upward long-term trend, with swings up and down over the period we study.

This same pattern appears in Model E, after considering women's labor force participation.

Lastly in Model F where 33% of the variances in period is accounted for, the remaining period

effects again show a general upward trend with small swings that peak in 1993 and with negative

effects in the years 1977-86, 1980-81, and 1994-98.

The remaining period effect unaccounted for by these models can be seen as associated

with historical changes in women's labor force participation rates and the rate of economic

growth. Graph 4 shows the association between the unaccounted-for year variation in gender

attitude by female labor force participation (FLFP) rate and GDP growth rate. In the left panel,

the residual effect on gender attitude is fairly strongly associated with the rate of female labor

force participation, with most years concentrating at the high 50s in FLFP rate. The R-squared

is .57. On the right panel, GDP growth rate is negatively associated with residuals in gender

attitude for each year, with the R-squared at .10.

[GRAPH 4 ABOUT HERE]

In Models G we used FLFP rate as a year-level variable to account for the residuals. In

Model H, we further added GDP growth rate as a second year-level variable. Graph 5 shows the

amount of unexplained period variances in this model. Both coefficients for FLFP and GDP

growth are statistically significant. The residues in Model F show an upward tendency with year,

with higher residues in recent years. This may be a result of rising FLFP rates over the years. In Model G, after we added the annual FLFP rate, 71% of the period variance was accounted for by this new model. More importantly, the residues did not show a correlation with year, i.e. the upward trend over the years disappeared. In Model H, after we expanded the model to include annual GDP growth rate, 81% of the period variance in period was now accounted for. These two macro-level variables effectively accounted for half of the period-based variance in gender attitudes.

[GRAPH 5 ABOUT HERE]

CONCLUSION

In this paper, we made two contributions to the growing literature on Americans' changing attitudes about gender roles. First, we utilized a relatively new statistical model in order to simultaneously consider the influences of age, period, and cohort on changes in gender attitudes. This cross-classified age-period-cohort model offers a substantial improvement over earlier models, which were constrained to estimating only period and cohort influences and thus yielded flawed estimations.

One of the most striking results of our analysis was the degree of cohort-related differences in gender attitudes. Prior research suggested that newer cohorts are "no longer that much more liberal" than the cohorts they replace (Cotter et al. 2011), yet our analysis suggests that the youngest two generations may actually be more conservative than their predecessors. These younger generations reported similar gender attitudes to the Baby Boomers despite their different ages, and given the tendency for attitudes about gender to become more conservative

with age, we can reasonably expect their attitudes to become less liberal than the Boomers' over time. Cohort replacement has played an important role in the shift toward more egalitarian gender attitudes, so the declining liberalism among younger cohorts is especially troubling for those who would like to see the general trend toward egalitarianism continue.

Our results indicate that the vast majority of cohort variations in gender attitudes can be explained by the individual-level characteristics in our model. Changes in individual education, demographic characteristics, marriage and family arrangements, employment, income, and ideological orientations accounted for more than 85% of the cohort variations in gender attitudes. More recent cohorts have higher levels of education and generally express more liberal attitudes about civil rights and social issues, which helps explain cohort differences in gender attitudes. The larger number of respondents in younger cohorts reporting nontraditional family arrangements and female employment also helps explain variations across cohorts. Individual-level characteristics accounted for a much smaller percentage (around 30%) of the period variations in gender attitudes.

The second major contribution of our paper was the inclusion of macro-level indicators of broad social conditions. Previous research on gender attitudes has focused primarily on individual-level factors (Mason and Lu 1988, Cotter et al. 2011), but these factors have explained very little of the period variations in gender attitudes. Our analysis included two macro-level indicators which we hypothesized would change people's outlooks on family and work, as well as their attitudes toward women's roles and status in society: female labor force participation and economic growth. These indicators move beyond individual-level measures of female employment and income to capture the broader impacts of shifts in labor force composition and

economic health, independent of respondents' personal situations. In our analysis, these two variables accounted for nearly half of the period variations in gender attitudes. Previous research discounted the explanatory power of social structural influences on period effects and attributed these shifts to cultural patterns and feminist social movements (Cotter et al. 2011). Culture and protest are likely influences on gender role attitudes, but our analysis suggests the additional importance of demographic and economic influences.

Our models fail to explain one of the more interesting historical trends in American gender attitudes: the size of the conservative swing in the 1990s. Failing to find a structural explanation for this trend, Cotter et al. (2011) suggested that it could have resulted from growing endorsement of the "separate but equal" cultural gender frame. This frame appeared to emerge in the 1990s and centered around a woman's right to choose her role. Women could choose full-time motherhood or a career outside the home, and either role could be identified as a feminist act under this new egalitarian worldview. This cultural frame allowed for a horizontal division of gender roles without a vertical gender hierarchy, unlike earlier frames which equated traditional family arrangements with conservative gender ideologies. The GSS questions on gender do not allow for a nuanced examination of attitudes about women's roles and social status, so additional research will need to explore the extent to which the conservative shift in the 1990s can be explained by new cultural gender frames or other structural patterns.

REFERENCES

Blair-Loy, M. 2001. "Cultural Constructions of Family Schemas: The Case of Women
Executives." *Gender & Society* 15: 687-709.

Brewster, Karin L., and Irene Padavic. 2000. "Change in Gender-Ideology, 1977-1996: The
Contribution of Intracohort Change and Population Turnover." *Journal of Marriage and
the Family* 62: 477-487.

Brooks, Clem, and Catherine Bolzendahl. 2003. "The Transformation of US Gender Role
Attitudes: Cohort Replacement, Social-Structural, and Ideological Learning." *Social
Science Research* 33: 106-133.

Cassidy, Margaret L., and Bruce O. Warren. 1996. "Family Employment Status and Gender Role
Attitudes: A comparison of Women and Men College Graduates." *Gender and Society* 10:
312-29.

Charles, Maria and Karen Bradley. 2009. "Indulging Our Gendered Selves? Sex Segregation by
Field of Study in 44 Countries." *American Journal of Sociology* 114: 924-76.

Charles, Maria and David Grusky. 2004. *Occupational Ghettos: The Worldwide Segregation of
Women and Men*. Stanford, CA: Stanford University Press.

Cherlin, Andrew, and Pamela Barnhouse Walters. 1981. "Trends in United State Men's and
Women's Sex Role Attitudes: 1972-78." *American Sociological Review* 46: 453-60.

Ciabattari, T. 2001. "Changes in Men's Conservative Gender Ideologies—Cohort and Period
Influences." *Gender and Society* 15: 574-91.

Cotter, David, Joan M. Hermsen, and Reeve Vanneman. 2011. "The End of the Gender

    Revolution? Gender Role Attitudes from 1977 to 2008." *American Journal of Sociology*

    117(1): 259-289.

Davis, Shannon N. and Theodore N. Greenstein. 2009. "Gender Ideology: Components,

    Predictors, and Consequences." *Annual Review of Sociology* 35: 87-105.

Fan, Pi-Ling and Magaret Mooney Marini. 2000. "Influences on Gender-Role Attitudes during

    the Transition to Adulthood." *Social Science Research* 29: 258-83.

Ferree, Myra Marx. 1974. "A Woman for President? Changing Responses: 1958-1972." *Public*

    Opinion Quarterly 38: 390-99.

Fischer, Claude S. and Michael Hout. 2006. *Century of Differences: How America Change in the*

    Last One Hundred Years. New York: Russell Sage.

Hout, Michael and Caroline Hanley. 2002. "The Overworked American Family: Trends and

    Nontrends in Working Hours, 1968-2001." Working Paper, Survey Research Center, UC

    Berkeley.

Jones, Landon. 1980. *Great Expectations: America and the Baby Boom Generation*. New York:

    BookSurge Publishing.

Lichter, Daniel T., and Zhenchao Qian. 2005. "Marriage and Family in a Multiracial Society."

    Pp. 169-200 in *The American People: Census 2000* by R. Farley and J. Haaga (eds.).

    New York: Russell Sage.

Mannheim, Karl. 1952. "The Problem of Generations." Pp. 276-322 in *Essays in the Sociology of Knowledge*, edited by P. Kecshemeti. Boston: Routledge and Kegan Paul.

Mannheim, Karl. 1952. *Essays on the Sociology of Knowledge.* London: RKP.

Mason, Karen Oppenheim, and Larry Bumpass. 1975. "U.S. Women's Sex-Role Ideology, 1970." *American Journal of Sociology* 80: 1212-1219.

Mason, Karen Oppenheim, John L. Czajka, and Sara Arber. 1976. "Changes in U.S. Women's Sex-Role Attitudes, 1964-1974." *American Sociological Review* 41: 573-596.

Mason, Karen Oppenheim, and Yu-Hsia Lu. 1988. "Attitudes toward Women's Familial Roles: Changes in the United States, 1977-1985." *Gender and Society* 2: 39-57.

Peltola, Pia, Melissa A. Milkie, and Stanley Presser. 2004. "The Feminist Mystique: Feminist Identity in Three Generations of Women." *Gender and Society* 18: 122-44.

Powell, Brian and Lala Carr Steelman. 1982. "Testing an Undertested Comparison: Maternal Effects on Sons' and Daughters." *Journal of Marriage and the Family* 44: 349-356.

Rindfuss, Ronald R., Karin L. Brewster, and Andrew L. Kavee. 1996. "Women, Work, and Children: Behavior and Attitude Change in the United States." *Population and Development Review* 22: 457-478.

Ryder, Norma B. 1965. "The Cohorts as a Concept in the Study of Social Change." *American Sociological Review* 30: 843-861.

Shu, Xiaoling. 2012. "Mapping Gender Ideologies Globally: Gender Attitudes in 47 Countries."

    Paper presented at the American Sociological Association conference, Denver, CO.

Smith, Tom W., Peter Marsden, Michael Hout, and Jibum Kim. 2013. *General Social Surveys,*

    1972-2012. Machine-readable data file. Chicago: National Opinion Research Center.

Smith-Lovin, Lynn and Ann R. Tickamyer. 1978. "Nonrecursive Models of Labor Force

    Participation, Fertility Behavior, and Sex Role Attitudes." *American Sociological Review*

    43: 541-557.

Spitze, Glenna, and Joan Huber. 1980. "Changing Attitudes toward Women's Nonfamily Roles."

    Sociology of Work and Occupations 7: 317-335.

Sprague, J. 1982. "Is There a Micro Theory Consistent with Contextual Analysis?" Pp.99-121 in

    Strategies of Political Inquiry, edited by E. Ostrom. Beverly Hills: Sage Publications.

Steensland, Brian, Jerry Z. Park, Mark D. Regnerus, Lynn D. Robinson, W. Bradford Wilcox,

    and Robert D. Woodbury. 2000. "The Measures of American Religion: Toward

    Improving the State of the Art." *Social Forces* 79(1): 291-318.

Strauss, William and Neil Howe. 1991. *Generations*. New York, NY: Harper Perennial. Coward,

    McCann and Geoghegan.

Tallichet, Suzanne E., and Fern K. Willits. 1986. "Gender Role Attitude Change of Young

    Women: Influence Factors from a Panel Study." *Social Psychology Quarterly* 49: 219-27.

Thornton, Arland, and Deborah Freedman. 1979. "Changes in Sex Role Attitudes of Women,

    1962-1977: Evidence from a Panel Study." *American Sociological Review* 44: 831-842.

Thornton, Arland, Duane F. Alwin, and Donald Camburn. 1983. "Causes and Consequences of

       Sex-Role Attitudes and Attitude Change." *American Sociological Review* 48: 211-227.

Thornton, Arland, and Linda Young-DeMarco. 2001. "Four Decades of Trends in Attitudes

       toward Family Issues in the United States: the 1960s through the 1990s." *Journal of*

       Marriage and the Family 63: 1009-37.

U.S. Bureau of Labor Statistics. 2013. "Labor Force Statistics from the Current Population

       Survey: Employment Status of the Civilian Noninstitutional Population 16 Years and

       Over by Sex, 1972 to Date." (http://bls.gov/cps/cpsaat02.htm).

Wilcox, Clyde, and Ted G. Jelen. 1991. "The Effects of Employment and Religion on Women's

       Feminist Attitudes." *International Journal for the Psychology of Religion* 1: 161-71.

Wilkie, Jane Riblett. 1993. "Changes in U.S. Men's Attitudes towards the Family Provider Role,

       1972-1989." *Gender and Society* 7: 261-279.

Wohl, Robert. 1979. *The generation of 1914*. Cambridge, Mass.: Harvard University Press.

World Bank. 2013. "Data on the United States." (http://data.worldbank.org/country/united-

       states).

Yang, Yang. 2008. "Social Inequalities in Happiness in the United States, 1972 to 2004: An Age-

       Period-Cohort Analysis." *American Sociological Review* 73: 204-226.

Table 1. Cross classified by Birth Cohort and Survey Year of the American General Survey (1077-2012) (N = 39531)

Birth Cohort (J)	Survey Year (K)																		Cohort Total
	1977	1985	1986	1988	1989	1990	1991	1993	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	
The Greatest Generation I 1900-09	141	87	83	50	55	51	43	29	49	32	12	0	0	0	0	0	0	0	632
The Greatest Generation II 1910-18	180	145	127	139	115	118	114	98	159	103	101	102	60	33	40	0	0	0	1634
The Greatest Generation III 1919-27	239	203	182	177	177	144	153	157	262	205	209	185	155	115	173	77	70	47	2930
The Silent Generation I 1928-33	145	113	93	97	97	90	105	98	171	157	157	146	166	114	193	90	73	62	2167
The Silent Generation II 1934-39	160	137	108	91	131	87	97	115	214	182	166	166	178	168	256	111	88	100	2555
The Silent Generation III 1940-45	188	138	156	134	149	119	126	140	300	261	225	192	194	231	328	141	162	128	3312
Baby Boomers I 1946-51	207	192	191	199	186	170	189	203	368	346	304	296	286	271	446	195	205	191	4445
Baby Boomers II 1952-58	223	264	266	223	250	250	268	291	474	465	430	453	371	408	638	286	255	223	6038
Baby Boomers III 1959-64	3	186	189	215	208	174	203	202	468	424	438	387	324	365	573	243	223	222	5047
Generation X I 1965-69	0	49	60	138	134	128	148	157	298	312	306	294	311	270	467	171	191	163	3597
Generation X II 1970-74	0	0	0	3	31	41	68	106	187	293	275	268	270	287	461	208	171	192	2861
Generation X III 1975-80	0	0	0	0	0	0	0	5	36	118	205	269	335	328	479	203	228	228	2434
Millennials I 1981-87	0	0	0	0	0	0	0	0	0	0	0	51	101	213	419	223	263	243	1513
Millennials II 1988-94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	65	112	170	366
Year Total	1486	1514	1455	1466	1533	1372	1514	1601	2986	2898	2828	2809	2751	2803	4492	2013	2041	1969	39531

Table 2: Coefficients for Multilevel Cross-Classified Models of Gender Role Attitudes, with Cohort and Survey Year as Random Effects

	Model A Coef.	S.E.	Model B Coef.		S.E.	Model C Coef.		S.E.	Model D Coef.		S.E.	Model E Coef.		S.E.	Model F Coef.		S.E.
Intercept	-0.01	0.08	-0.04		0.07	-0.02		0.07	-0.11	*	0.05	-0.11	*	0.05	-0.14	**	0.05
Age			-0.002	***	0.0007	-0.003	***	0.0007	-0.003	***	0.0007	-0.003	***	0.0007	-0.0004		0.0007
Male						-0.24	***	0.009	-0.22	***	0.01	-0.21	***	0.01	-0.2	***	0.009
Race																	
Non-Hispanic White[a]						-		-	-		-	-		-	-		-
Non-Hispanic Black						0.02		0.01	0.06	**	0.02	0.06	**	0.02	0.05	**	0.02
Asian						-0.26	***	0.04	-0.29	***	0.04	-0.29	***	0.04	-0.25	***	0.03
Hispanic						-0.24	***	0.02	-0.12	***	0.02	-0.12	***	0.02	-0.13	***	0.02
Marital and Parental Status																	
Married with Children[a]									-		-	-		-	-		-
Married with No Children									-0.06	**	0.02	-0.06	**	0.02	-0.07	***	0.02
Not Married with Children									0.13	***	0.01	0.14	***	0.01	0.1	***	0.01
Not Married with No Children									0.06	***	0.02	0.07	***	0.02	0.03	*	0.02
Number of Children in Household																	
Below 6 Years Old									-0.02	*	0.009	-0.02		0.009	-0.007		0.009
6-12 Years Old									-0.01		0.007	-0.01		0.007	-0.009		0.007
13-17 Years Old									-0.005		0.009	-0.007		0.009	-0.003		0.009
Education									0.03	***	0.002	0.03	***	0.002	0.02	***	0.002
Wife Has More Education									0.05	***	0.01	0.05	***	0.01	0.05	***	0.01
Mother's Education									0.01	***	0.002	0.01	***	0.002	0.008	***	0.002
Father's Education									0.002		0.002	0.002		0.002	0.0008		0.001
Religious Affiliation																	
Mainline Protestant[a]									-		-	-		-	-		-
Evangelical									-0.17	***	0.01	-0.17	***	0.01	-0.09	***	0.01
Baptist									-0.01		0.03	-0.01		0.03	-0.008		0.03
Catholic									-0.004		0.01	-0.003		0.01	-0.02		0.01
Jewish									0.1	**	0.03	0.1	**	0.03	0.02		0.03
Other Faith									-0.11	***	0.02	-0.11	***	0.02	-0.09	***	0.02
Nonaffiliated									0.005		0.02	0.004		0.02	-0.03		0.02
Religious Attendance									-0.03	***	0.002	-0.03	***	0.002	-0.01	***	0.002
Family Income (Logged Constant Dollars)									0.02	***	0.006	0.02	***	0.006	0.02	***	0.006
Man is Manager/Professional									-0.017		0.012	0.005		0.01	-0.003		0.01
Woman Working												0.08	***	0.02	0.08	***	0.01
Woman Working Full-Time												0.11	***	0.02	0.11	***	0.01
Woman is Manager/Professional												0.07	***	0.01	0.06	***	0.01
Liberal Rights Ideology															0.21	***	0.02
Political Conservatism															-0.07	***	0.003
Missing Data Controls																	
Mother's Education Missing									-0.04	*	0.01	-0.04	*	0.01	-0.02		0.01
Father's Education Missing									0.02	*	0.01	0.02	*	0.01	0.02	*	0.01
Family Income Missing									-0.05	**	0.02	-0.05	**	0.02	-0.03		0.02
Variance Component																	
Period	0.007		0.022			0.022			0.022			0.019			0.015		
Cohort	0.089		0.015			0.015			0.007			0.004			0.002		
Individual	0.454		0.453			0.436			0.398			0.391			0.363		
Total	0.549		0.491			0.473			0.427			0.415			0.380		
Prop. Variance Accounted Relative to Model B. For Model B, Prop. Variance of Total.																	
Period			0.045			0.000			0.000			0.144			0.318		
Cohort			0.031			0.000			0.572			0.737			0.867		
Individual			0.923			0.040			0.122			0.139			0.199		
Total						0.036			0.131			0.155			0.226		
Deviance	41221		41213.2			40403.3			38259.9			38231.5			36798.3		

a Omitted category

* p < .05, ** p < .01, *** p < .001

Table 3. Changes in Cohort and Period Effects from Cross-classified APC Fixed Effect Models

	Model B Coeff.	Std. Dev	Model C Coeff.	Std. Dev	Model D Coeff.	Std. Dev	Model E Coeff.	Std. Dev	Model F Coeff.	Std. Dev
Survey Years										
1977	-0.37 ***	0.04	-0.37 ***	0.04	-0.14 **	0.05	-0.16 **	0.05	-0.27 ***	0.04
1985	-0.11 **	0.03	-0.10 **	0.03	0.03	0.03	0.06	0.03	-0.05	0.03
1986	-0.07 *	0.03	-0.08 *	0.03	0.00	0.04	-0.01	0.04	-0.22 ***	0.04
1988										
1989	0.00	0.03	0.00	0.03	0.12 **	0.04	0.14 **	0.04	0.02	0.03
1990	0.03	0.03	0.03	0.03	0.22 ***	0.04	0.20 ***	0.04	-0.09 *	0.04
1991	0.02	0.03	0.02	0.03	0.12 **	0.04	0.11 **	0.04	-0.10 *	0.04
1993	0.11 **	0.04	0.12 **	0.03	0.22 ***	0.04	0.19 ***	0.04	0.17 ***	0.04
1994	0.12 **	0.03	0.12 **	0.03	0.25 ***	0.04	0.23 ***	0.04	-0.08	0.04
1996	0.06	0.04	0.06	0.03	0.32 ***	0.04	0.29 ***	0.04	0.00	0.04
1998	0.07	0.04	0.07	0.04	0.17 **	0.04	0.15 **	0.04	-0.09 *	0.04
2000	-0.03	0.04	-0.01	0.04	0.06	0.04	0.08	0.04	0.03	0.04
2002	0.05	0.05	0.06	0.05	0.16 **	0.05	0.19 **	0.05	0.09	0.05
2004	0.05	0.05	0.08	0.05	0.25 ***	0.06	0.23 ***	0.06	0.09	0.05
2006	0.08	0.05	0.11	0.05	0.42 ***	0.06	0.37 ***	0.06	0.15 *	0.05
2008	0.11	0.06	0.14	0.06	0.23 **	0.06	0.21 **	0.06	0.03	0.06
2010	0.18 **	0.06	0.21 **	0.06	0.26 ***	0.06	0.26 ***	0.06	0.13	0.06
2012	0.20 **	0.07	0.24 **	0.07	0.34 ***	0.07	0.33 ***	0.07	0.05	0.07
Birth Cohort										
The Greatest Generation I 1900-09	-0.31 **	0.07	-0.32 **	0.07	-0.24 **	0.07	-0.22 **	0.07	-0.15 *	0.07
The Greatest Gneration II 1910-18	-0.20 **	0.05	-0.21 **	0.05	-0.15 **	0.05	-0.13 **	0.05	-0.09	0.05
The Greatest Generation III 1919-27	-0.09 *	0.03	-0.09 *	0.03	-0.07 *	0.03	-0.05 *	0.03	-0.04 *	0.03
The Silent Generation I 1928-33										
The Silent Generation II 1934-39	0.08 *	0.03	0.08 *	0.03	0.05	0.03	0.04	0.03	0.02	0.03
The Silent Generation III 1940-45	0.17 **	0.04	0.17 **	0.04	0.11 *	0.04	0.08 *	0.04	0.05	0.04
Baby Boomers I 1946-51	0.21 **	0.05	0.21 **	0.05	0.12 *	0.05	0.08 *	0.05	0.04	0.05
Baby Boomers II 1952-58	0.24 **	0.07	0.24 **	0.07	0.16 *	0.06	0.12 *	0.06	0.08	0.06
Baby Boomers III 1959-64	0.18 *	0.08	0.18 *	0.08	0.10	0.08	0.06	0.08	0.03	0.07
Generation X I 1965-69	0.17	0.10	0.17	0.09	0.09	0.09	0.07	0.09	0.05	0.09
Generation X II 1970-74	0.17	0.11	0.17	0.11	0.09	0.10	0.06	0.10	0.03	0.10
Generation X III 1975-80	0.10	0.12	0.12	0.12	0.04	0.11	0.02	0.11	-0.01	0.11
Millennials I 1981-87	0.13	0.14	0.14	0.14	0.05	0.13	0.03	0.13	0.00	0.12
Millennials II 1988-94	0.07	0.16	0.07	0.16	0.02	0.15	0.02	0.15	0.00	0.14
Prop. Variance Accounted										
Cohort					0.572		0.737		0.867	
Period					0.000		0.144		0.318	

Graph 1A. Changes in Four Gender Attitudes by survey years (1997-2012) and Generations (The Greatest Generation 1900-27, The Silent Generation 1928-45, The Baby Boomers 1946-64, Generation X 1965-80 and The Millennials 1981-).
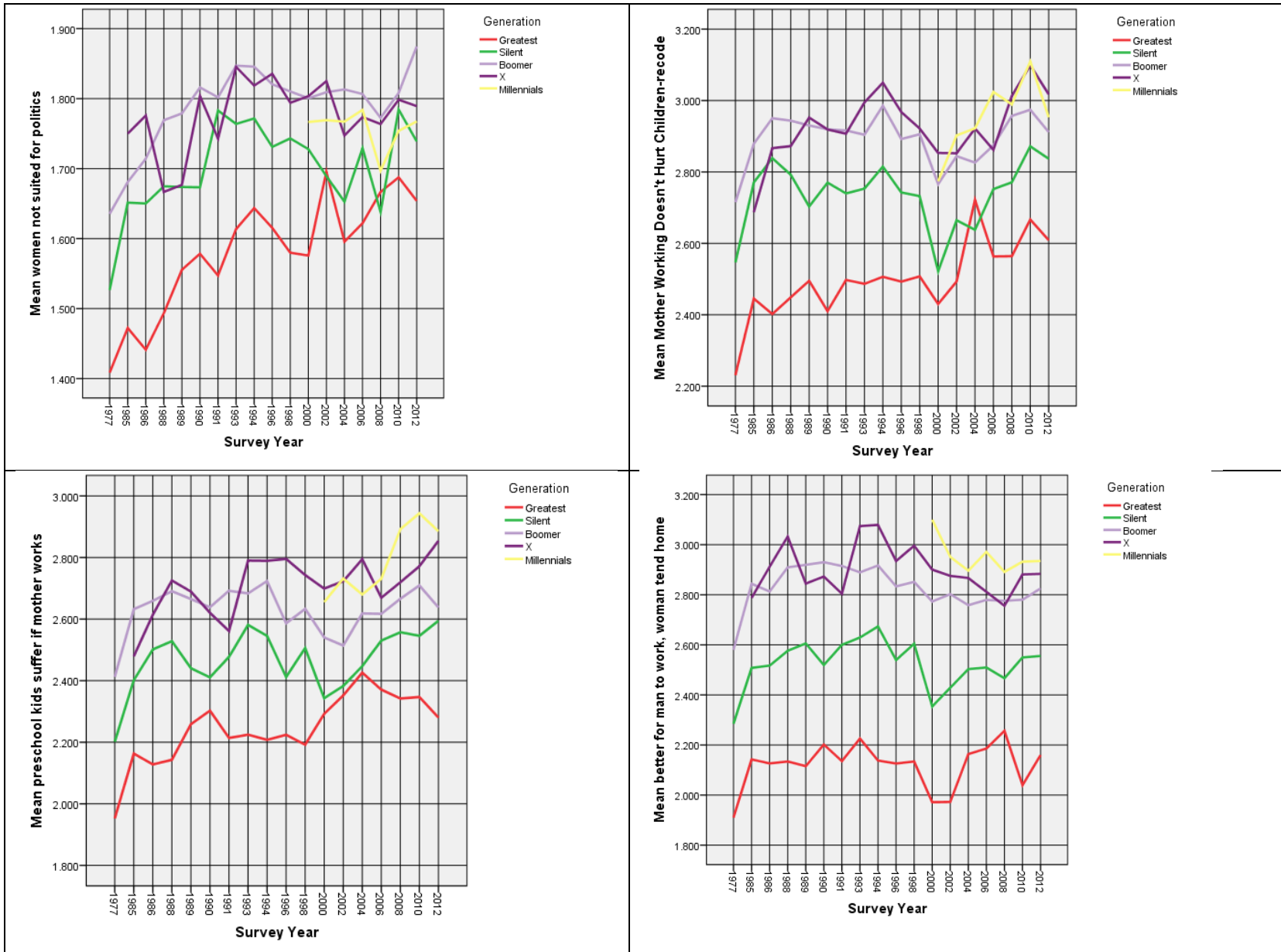
Graph 1B. Change in the Gender Attitude Scale and Change in Sample Composition by Cohorts.
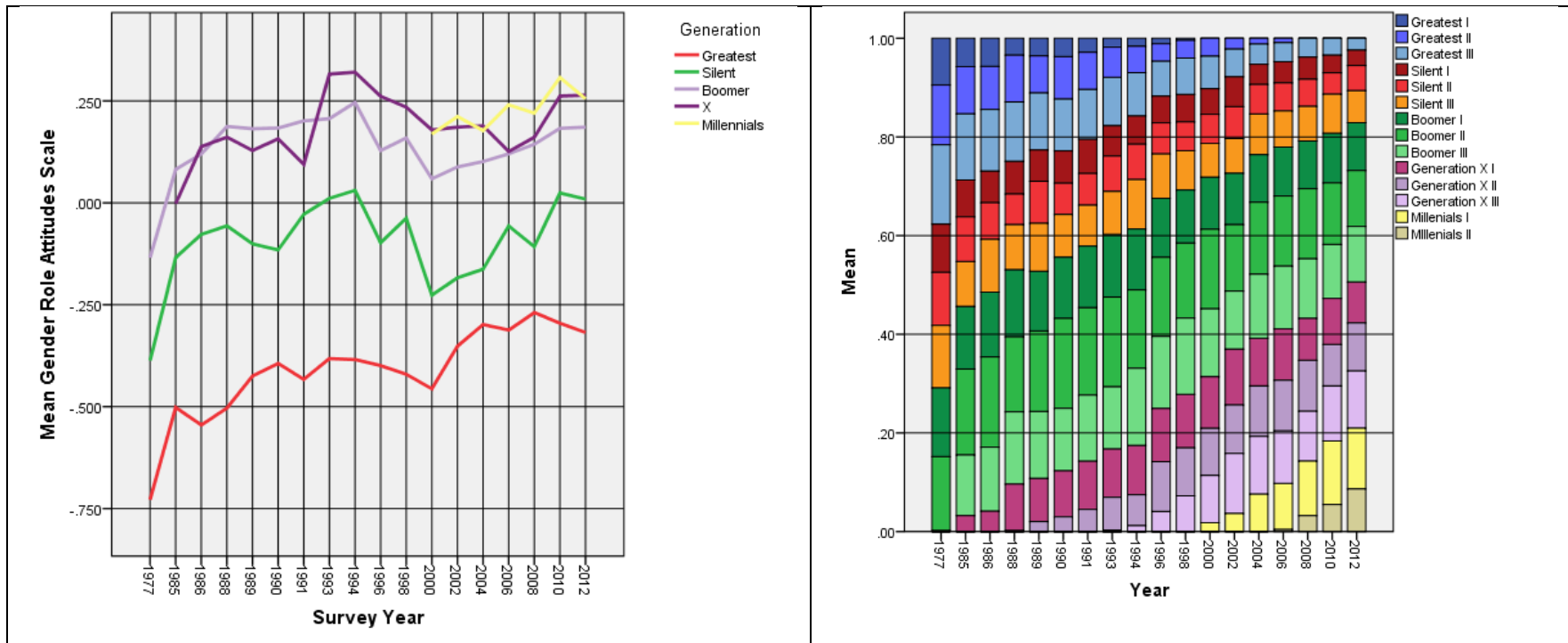
Graph 2A. Changes in Gender Attitudes by Age and Generations (The Greatest Generation 1900-27, The Silent Generation 1928-45, The Baby Boomers 1946-64, Generation X 1965-80 and The Millennials 1981-).
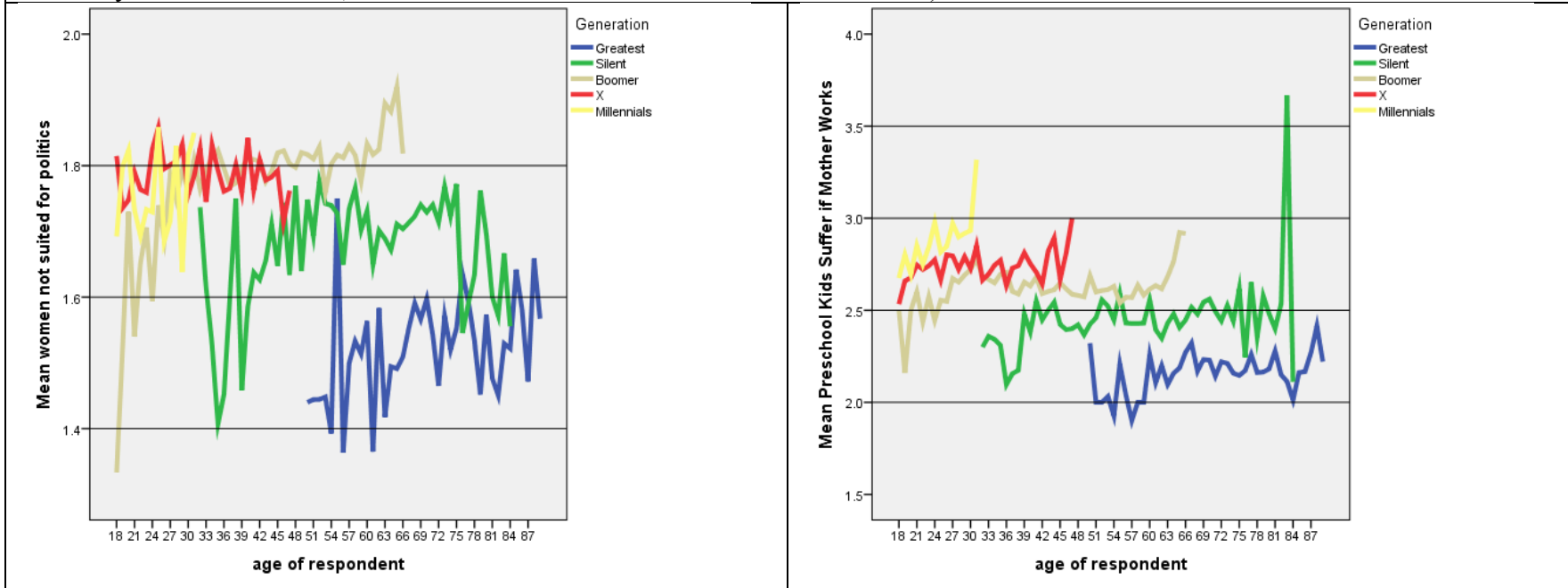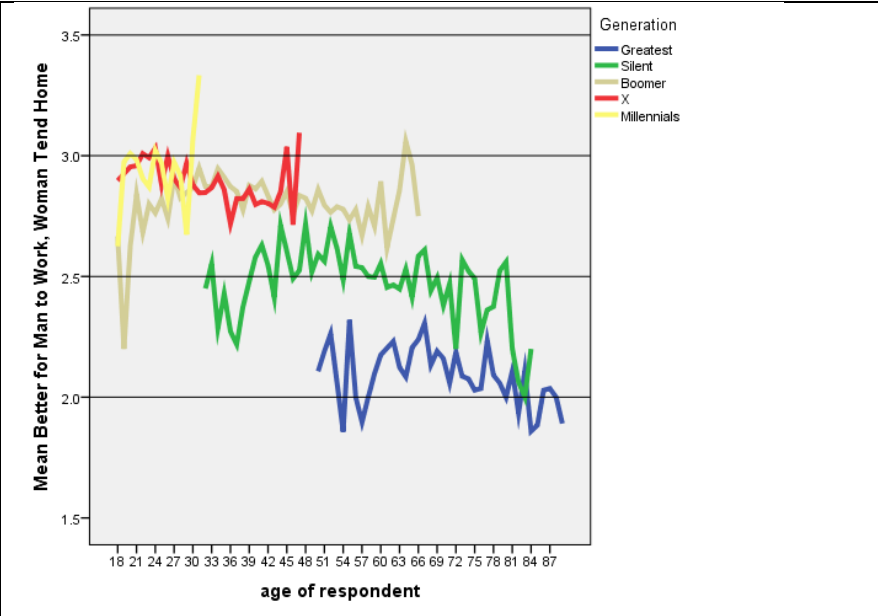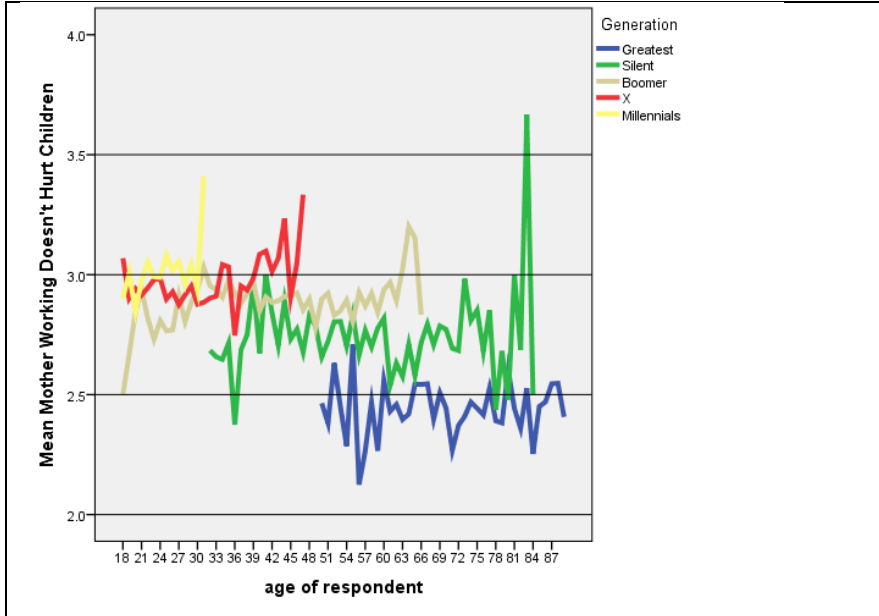
Graph 2B. Changes in the Gender Attitude Scale by Age and Generations (The Greatest Generation 1900-27, The Silent Generation 1928-45, The Baby Boomers 1946-64, Generation X 1965-80 and The Millennials 1981-).
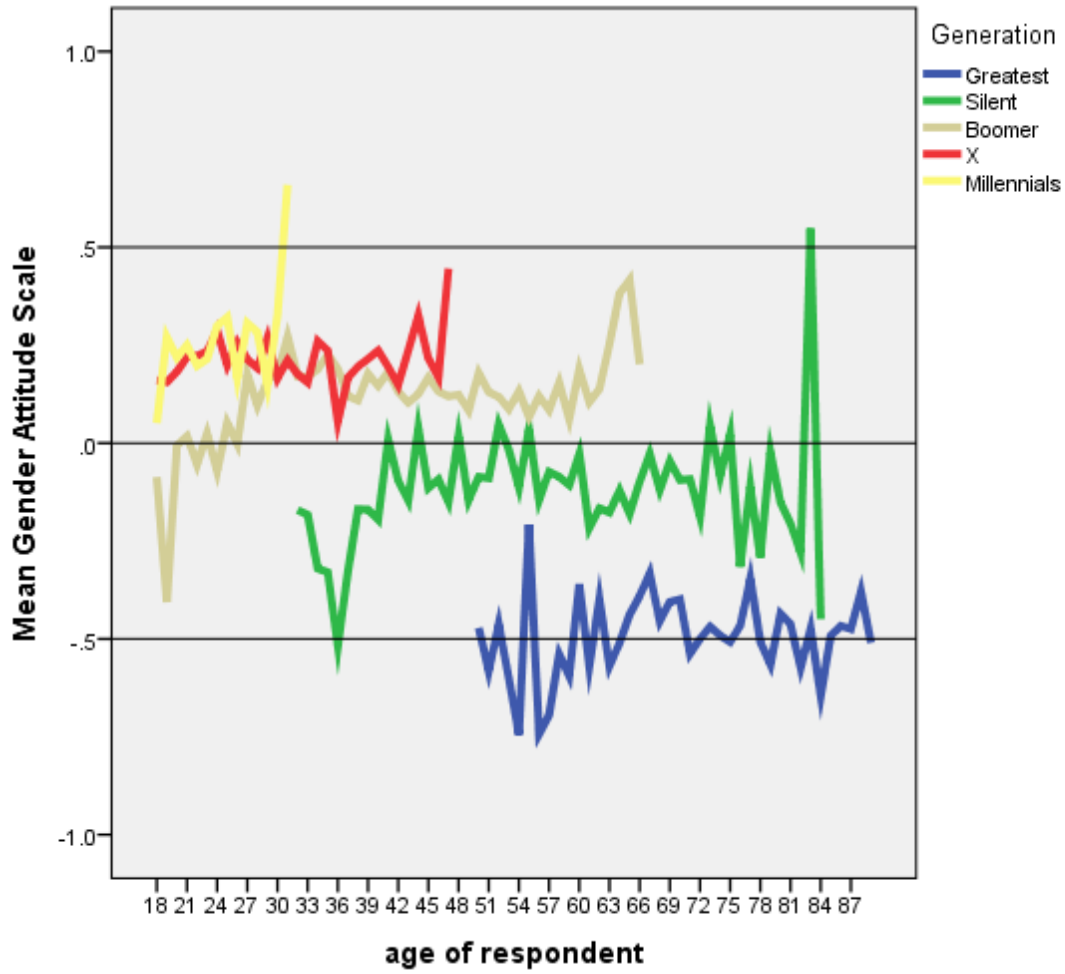
Graph 3A. Cohort Effects from Six APC Radom Effect Models

Model A. Year & Cohort	Model B. Year & Cohort + Age	Model C. Year & Cohort + Age + Gender & Race

Model D. Year & Cohort + Age + Gender & Race + Social Structure (account for 57.2% in cohort variance)	Model E. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP (account for 73.7% in cohort variance)	Model F. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP + Ideology (account for 86.7% in cohort variance)

Graph 3B. Period Effects from Six APC Random Effect Models.

Model A. Year & Cohort	Model B. Year & Cohort + Age	Model C. Year & Cohort + Age + Gender & Race
Model D. Year & Cohort + Age + Gender & Race + Social Structure (account for 1.8% in period variance)	Model E. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP (account for 14.4% in period variance)	Model F. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP + Ideology (account for 31.8% in period variance)

Graph 4. Gender Attitude, Female Labor Force Participation, and GDP Growth

Left panel:
- Y-axis: Gender Attitude (.300, .100, -.100, -.300, -.500, -.700)
- X-axis: Female Labor Force Participation Rate (lagged 2-year) (47.50, 50.00, 52.50, 55.00, 57.50, 60.00)
- Equation box: y=-1.57+0.03*x
- R^2 Linear = 0.569

Right panel:
- Y-axis: Gender Attitude (.300, .100, -.100, -.300, -.500, -.700)
- X-axis: GDP Growth Rate (lagged 2-year) (-2.00, .00, 2.00, 4.00, 6.00, 8.00)
- Equation box: y=0.06+-0.02*x
- R^2 Linear = 0.100

ROWID legend (both panels): 1977, 1985, 1986, 1988, 1989, 1990, 1991, 1993, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012

Graph 5. Reduction to Period Variances by Macro-level Predictors: Female Labor Force Participation Rate and GDP Growth Rate

Model F. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP + Ideology (account for 31.8% in period variance)	Model G. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP + Ideology + Female Labor Force Participation Rate (account for 70.6% in period variance)	Model H. Year & Cohort + Age + Gender & Race + Social Structure + Women's LFP + Ideology + Female Labor Force Participation Rate + GDP Growth Rate (account for 81.0% in period variance)

Table A1: Descriptive Statistics

Variable	N	Mean	SD	Min	Max	Missing
Gender Attitudes						
Gender Attitudes Scale	25539	0.012	0.727	-2.008	1.577	14181
Working Mother Establishes Secure Attachment	25278	0.655	0.475	0	1	14442
Preschool Children Suffer from Working Mother	24978	0.545	0.498	0	1	14742
Woman Should Take Care of Home and Family	25003	0.596	0.491	0	1	14717
Men Better Suited for Politics	23675	0.729	0.444	0	1	16045
Survey Year	39720	1997.906	8.703	1977	2012	0
Birth Year	39600	1951.726	19.068	1888	1994	120
Age	39600	46.18	17.371	18	89	120
Age Squared	39600	2434.307	1769.973	324	7921	120
Birth Cohort	39531	8.011	3.038	1	14	189
Male	39720	0.44	0.496	0	1	0
Race						
Non-Hispanic White	39109	0.79	0.407	0	1	611
Non-Hispanic Black	39109	0.134	0.341	0	1	611
Black	39109	0.018	0.134	0	1	611
Hispanic	39109	0.058	0.233	0	1	611
Education (in years)	39612	13.123	3.08	0	20	108
Wife Has More Education	39720	0.154	0.361	0	1	0
Mother's Education	39720	11.061	3.322	0	20	0
Mother's Education Missing	39720	0.177	0.382	0	1	0
Father's Education	39720	10.897	3.581	0	20	0
Father's Education Missing	39720	0.301	0.458	0	1	0
Religious Affiliation						
Mainline Protestant	37763	0.187	0.39	0	1	1957
Evangelical	37763	0.262	0.44	0	1	1957
Baptist	37763	0.086	0.28	0	1	1957
Catholic	37763	0.256	0.436	0	1	1957
Jewish	37763	0.021	0.142	0	1	1957
Other Faith	37763	0.059	0.235	0	1	1957
Nonaffiliated	37763	0.13	0.336	0	1	1957
Religious Attendance	39261	3.73	2.735	0	8	459
Marital and Parental						
Married with Children	39593	0.434	0.496	0	1	127
Married without Children	39593	0.069	0.253	0	1	127
Not Married with Children	39593	0.29	0.454	0	1	127
Not Married without Children	39593	0.208	0.406	0	1	127
Number of Children in Household						
Under 6 Years Old	39451	0.214	0.547	0	6	269
6-12 Years Old	39426	0.261	0.628	0	8	294
13-17 Years Old	39494	0.188	0.506	0	7	226
Woman Working	39720	0.439	0.496	0	1	0
Woman Working Full-Time	39720	0.333	0.471	0	1	0
Woman's Professional/Managerial Status	39720	0.23	0.421	0	1	0
Man's Professional/Managerial Status	39720	0.215	0.411	0	1	0
Family Income	39720	10.357	0.953	5.948	12.103	0
Family Income Missing	39720	0.112	0.315	0	1	0
Liberal Rights Ideology	35273	0.047	0.69	-2.509	1.67	4447
Political Conservatism	35206	0.123	1.386	-3	3	4514