The Dating Preferences of Liberals and Conservatives

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Abstract   American politics has become more polarized. The source of the phenomena is debated. We posit that human mate choice may play a role in the process.
Spouses are highly correlated in their political preferences, and research in
behavioral genetics, neuroscience, and endocrinology shows that political preferences develop through a complex interaction of social upbringing, life experience,
immediate circumstance, and genes and hormones, operating through one's psychological architecture by Hatemi et al. (J Theor Politics, 24:305–327, 2012).
Consequently, if people with similar political values produce children, there will be
more individuals at the ideological extremes over generations. This said, we are left
with a mystery: spousal concordance on political attitudes does not result from
convergence over the course of the relationship, nor are spouses initially selecting
one another on political preferences. We examine whether positive mate assortation—like seeks like—on non-political factors such as lifestyle and demographics
could lead to inadvertent assortation on political preferences. Using a sample of
Internet dating profiles we find that both liberals and conservatives seek to date
individuals who are like themselves. This result suggests a pathway by which longterm couples come to share political preferences, which in turn could be fueling the
widening ideological gap in the United States.

Keywords   Ideology · Polarization · Human mate choice · Mate assortation

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Introduction

Over the past half-century we have witnessed increased political polarization in the United States, both among elected officials and within the mass public (see Layman et al. 2006 for a review, but also see Fiorina et al. 2005). For example, recent debate over the Obama Patient Protection and Affordable Care Act (i.e. "Obamacare") has focused not on the central policy issues of insurance coverage and cost, but rather on whether religious organizations should be required to cover contraceptive care for women if it runs against their religious beliefs, reframing economic issues in divisive social and cultural terms. In public discussion of the policy, public furor on both sides was further galvanized when a popular conservative talk radio host referred to a female advocate for contraception access as a "slut" (Stelter 2012), and a prominent Republican 2012 presidential candidate compared President Obama to Adolph Hitler (Milbank 2012). Meanwhile, some on the left have gone so far as to posit that Republicans are enabling, or even acting to cause, economic stagnation in order to strengthen their argument against Democrats in the 2012 elections (Gerson 2010). More broadly, on both sides social movements have fueled the fervor, from the Tea Party movement on the right to the Occupy movement on the left. In all, Gallup polling data from January of 2011 also show that there is a 78 % point gap in job approval for President Obama between Democrats (80 % approval) and Republicans (12 %); this gap is one of the highest in Gallup polling history (Jones 2012).

While these and other consequences of political polarization are abundant, the source of this phenomenon is debated (Layman et al. 2006). Until recently, human mate selection appeared unrelated to this debate. However, an increasing number of studies have identified a critical link between mate selection and political preferences. More specifically, a long history of scholarship has documented parent–child concordance in political attitudes, based on the assumption that such similarity results from processes of socialization (Botwin et al. 1997; Campbell et al. 1960; Jennings and Niemi 1968; Stoker and Jennings 1989; 2006; Zuckerman et al. 2005). Without rejecting this avenue of transmission, recent research shows that our political predilections are also heritable (Alford et al. 2005; Eaves et al. 1989; Eaves and Eysenck 1974; Fowler et al. 2008; Hatemi et al. 2010; Martin et al. 1986), and that individuals in long-term relationships tend to share similar political preferences (Coffé and Need 2010; Eaves et al. 1999; Eaves and Hatemi 2008; Jennings and Stoker 2000; Martin et al. 1986; Zietsch et al. 2011).[1] As a consequence, regardless of whether the transmission of political preferences is caused by socialization, genetics, or idiosyncratic life experiences, more often than not liberal parents produce liberal offspring, who then marry liberal partners, who then produce more liberal offspring, and so on (the same being said of conservatives). Otherwise stated, if positive assortation—like seeks like—occurs over each successive generation, it will cause a widening of the variance in the

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[1] Among the traits along which humans assort, political orientation is among the highest, correlating at about $r = 0.67$–0.70 between spouses (Eaves et al. 1999; Martin et al. 1986). Only religion and church attendance are more concordant.

assorted trait and more individuals at the extremes in the population.[2] In the case of assortation on political preferences, the consequence is increased political polarization.

This said, it is still unclear how long-term couples come to share political preferences. Similarity in political attitudes is only marginally, if at all, influenced by the amount of time couples spend together, and has little to do with the dominance of one partner over another. Rather, long term spouses start out their relationship with more closely aligned political preferences than random mating would predict (Alford et al. 2011). However, using a sample of Internet dating profiles, Klofstad et al. 2011 found most daters do not advertise their ideology (i.e., most identified as "middle of the road"), or give politics any primacy in date selection. As such, Klofstad and colleagues conclude that advertising politics when attempting to attract a mate is "costly" because affiliation with one ideological camp or the other could theoretically cut one's dating pool in half.[3]

A potential solution to this puzzle of how spouses come to share political preferences lies in the simple fact that people associate with those who are similar to them (Heath et al. 1985; Huckfeldt 1983). Important aspects of such similarity are shared interests and values (Zietsch et al. 2011; Todd et al. 2007). Consequently, we might assort on political preferences "by accident" as we seek out mates who are similar to us on non-political dimensions which correlate with political traits. For example, Catholics may like to marry other Catholics, and since until recently Catholics were more likely to affiliate as Democrats, they end up aligning on politics as well as religion. To be clear, we are not making an exclusive argument regarding the basis of mate selection or political polarization; there are many antecedents to both phenomena.[4] This said, considering that assortation on political preferences could lead to increased polarization over time, we explore if spousal concordance on political preferences could be due to mates seeking others who are similar to themselves on traits related to ideology. This hypothesis had not yet been tested.

To test this hypothesis we draw from a large sample of Internet dating profiles to assess what daters are looking for in a potential mate. Overall, we find that liberals and conservatives do not differ wildly in their assortative tendencies, with both groups typically demonstrating a strong preference to date similar others. This suggests that our desire for social homogamy influences who we encounter as we date, and then within that group of like individuals we inevitably choose a partner

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[2] Assortative mating is pervasive in a variety of species, including humans (Mare 1991; Vandenberg 1972). In humans, it is extremely rare to find negative assortment on any social trait of interest. Rather, humans assort positively on a number of traits, including religiosity (Botwin et al. 1997), intelligence (Kanazawa 2010) and political ideology (Alford et al. 2011; Eaves et al. 1999).

[3] For evidence of how differences in political preferences can negatively influence one's perception of potential dating partners see Byrne (1961), Cavior et al. (1975), Curry and Kenny (1974), and Kofoed (2008).

[4] For example, literature consistent with an evolutionary theory on parental investment suggests that men privilege physical attractiveness in women, while women often seek wealth and status from men (Todd et al. 2007).

who shares our political preferences. That is, assortation on factors other than ideology could be driving assortation on ideology.

In addition, while increased attention has been directed toward the relationship between romance and politics, very little has been directed toward what influences human mate choice might have on the overall electorate. That is, the focus has been on the micro-processes of assortation, but not the macro-level effects. One area in which mate selection might intrude on politics is polarization. That is, if the act of searching out similar others in dating and mating remains consistent it should have significant consequences for the overall distribution of political preferences in society over time. Simply put, if parents mate on a trait, and that trait is also transmitted to their offspring, whether by social or biological mechanisms, and the trait is normally distributed in the population, it should result in greater population variance. To illustrate this broader consequences of our "likes seeks like" behavior on the political system, we use a computer simulation to show that assortation on political preferences can lead to political polarization over generations.

Data and Methods

Data Collection: Online Dating Profiles

In the fall of 2009, data were collected from profiles posted on a popular Internet dating website. The exact source of this data remains confidential to preserve the privacy of the users of this service.[5] We can reveal, however, that the individuals we studied selected their own dates (i.e., the online service did not match couples together). In interpreting our findings made with these data, it is important to consider that dating profiles are not a perfect representation of human mate choice. For example, as discussed above Klofstad et al. (2011) show that people have an incentive to misrepresent their political preferences in dating profiles (i.e., a "withholding effect").[6] Otherwise stated, people might date those they meet in person who they would never consider on-line, or vice versa. This issue of measurement error aside, the dating profile research design is frequently used by scholars in a variety of fields as a reliable method for studying human mate choice (e.g., Bereczkei et al. 1997; Greenlees and McGrew 1994; McGraw 2002; Waynforth and Dunbar 1995; Wiederman 1993). Moreover, online dating is becoming an increasingly prevalent behavior. For example, a study commissioned by Match.com, a popular Internet dating service, shows that 17 % of US couples married in the last 3 years met through an online dating website (Chadwick Martin Bailey 2010). Madden and Lenhart's (2006) Pew Online Dating report shows that

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[5] Although the site itself is public, with no inherent expectation of privacy, in our human subjects protocol we agreed to keep the exact source confidential to preserve the privacy of those individuals posting profiles.

[6] For other examples see Pawlowski and Dunbar (1999) on how older women have an incentive not to list their age in dating profiles to appear younger, and Hall et al. (2010) on how men are more likely to misrepresent personal assets, while women are more likely to misrepresent weight. We thank an anonymous reviewer for clarifying this feature of our data set.

15 % of American adults know someone who had married or been in a long-term relationship with someone they met online.

To develop a nationally-representative sample of dater profiles, we randomly selected 313 United States zip codes and extracted information from the first five profiles of men seeking women and the first five profiles of women seeking men listed within a ten mile radius of each zip code. Because we are generally concerned with mate selection as a mechanism by which the transmission of political orientations occurs from biological parents to offspring, data were not collected from individuals seeking a same-sex partner. The information gathered from the profiles is based on responses to a "close-ended" survey completed by the dater (i.e., our data do not include content coding of "open-ended" text). Data were collected from a total of 2,944 profiles because some zip codes contained fewer than five male and/or female profiles.

Ideological Content in Dating Profiles

Daters were allowed to identify themselves as either "very liberal" (1.6 %), "liberal" (8.8 %), "middle of the road" (56.6 %), "conservative" (15.5 %), "ultra conservative" (1.5 %), "non-conformist" (2.0 %), "some other viewpoint" (11.0 %), or "no answer" (3.2 %). In comparison to nationally-representative samples of American adults, this ideological distribution is skewed towards the "middle of the road" category (Klofstad et al. 2011). This aspect of our data is likely due to the fact that most daters do not wish to limit their dating pool by declaring a definitive political preference (Byrne 1961; Curry and Kenny 1974; Cavior et al. 1975; Klofstad et al. 2011; Kofoed 2008). In our analysis, liberals are coded as any dater identifying as either "very liberal" or "liberal"; conservatives are coded as any dater identifying as either "ultra conservative" or "conservative."

Measures of Assortative Dating Tendencies

Daters could list information about themselves and their ideal date for thirteen characteristics: race/ethnicity, faith/religion, body type, education, income, tobacco use, alcohol use, relationship status, having offspring (including details about whether offspring live in or out of the dater's household), desire to have offspring, hair color, eye color, and languages spoken. With the exception of race/ethnicity and languages spoken, daters were only allowed to select one category to describe themselves for each characteristic. Daters were allowed to check as many categories as they desired for each characteristic of their ideal date.

An assortation scale was created for each of the thirteen characteristics described above. The scale is coded whereby a score of 0 indicates that the dater desired a date completely unlike him/herself (complete negative assortation), while a score of 1 indicates that the dater only wanted a date completely like him/herself (complete positive assortation); values in between 0 and 1 indicate variation in the degree to which the dater was assorting positively or negatively. For example, the relationship status question has four categories: never married; currently separated; divorced; and widow/widower. Say the dater indicates that he or she has never been married.

If, in describing one's ideal date, he or she only expressed a preference for someone who has also never been married, that dater would be coded a 1. In contrast, if the same dater selected any relationship categorie(s) other than "never married", he or she would be coded a 0. The remainder of the scale would be of individuals who selected their own relationship type for their ideal date, but also selected other relationship types. The more categories selected, the closer the dater is scored to 0 on the assortation scale; the fewer categories selected, the closer the dater is placed to 1 on the scale. For each of the 13 scales, daters who did not answer the given profile question about themselves or their ideal dates were dropped from the scale.

Sample Characteristics

In our analysis we account for a number of factors that correlate with ideology and mate choice strategies: biological sex, age, race/ethnicity, education, and income. We also account for two life course factors: relationship status (whether the dater has been married before), and parental status (whether the dater has offspring). Physical attractiveness is also important to the mate choices of women and men. However, attractiveness remains highly subjective to idiosyncratic preferences and cultural values. Thus, person-specific ratings of beauty and attraction would be required for empirical study. Our data do not include such measures.

Method of Analysis

To examine whether liberal and conservative daters differ, we compared the characteristics described above of the two groups using two-sample t tests. We then conducted a regression analysis of each assortation scale. The models included both ideology and the sample characteristics described above. Including these additional characteristics in the analysis allowed us to account for explanations of assortation other than ideology. These multivariate analyses were conducted using least squares regression in the Zelig package of the R statistical computing program (Imai et al. 2007a, b; 2008).

To illustrate the wider consequences of positive assortation on political ideology in a model which captures genetic and environmental transmission of political attitudes from parents to offspring, we then examined the link between mate choice and political polarization with a computer simulation based on real population data. The simulation was created using PedEvolve,[7] a software package in the R statistical computing program for simulating the environmental and genetic dynamics that occur in populations across time (e.g., What will the distribution of ideology look like if we increase or remove genetic transmission or if assortative mating continues over time?). More specifically, the simulation allows populations of families to meet, mate, and have offspring who meet, mate, and have offspring, and so on for as many generations it takes until the environmental and genetic parameters in the simulation reach an equilibrium state.

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[7] The program, instructions and examples are available at http://www.matthewckeller.com/html/pedevolve.html. The simulation procedure and code are available from the authors.

Results

Characteristics of Liberal and Conservative Daters

Table 1 shows that conservative daters are more likely to be males and are less likely to belong to a racial or ethnic minority group. Liberals are younger, less likely to have been married, and less likely to have children, suggesting that this cohort of daters advances at a different pace in the life course than the conservative cohort. While liberals are better-educated than conservatives, this does not translate into any detectable income disparities between the two groups.

Assortative Dating Tendencies of Liberals and Conservatives

To test whether there are differences in assortation tendencies between liberals and conservatives, each of the thirteen assortation scales were analyzed with a regression model that included ideology and the sample characteristics presented in Table 1. Table 2 presents the results where ideology remains a significant predictor of assortation, despite inclusion of the sample characteristics in the model. To explore variance in these significant relationships by sex, separate models are also presented for males and females (Table 2). Based on the scaling of the assortation scales, positive coefficients indicate greater levels of positive assortation, and negative coefficients indicate greater levels of negative assortation.

As shown in Table 2, of the thirteen assortation scales we examined, among *all daters* ideology remained a significant predictor for only four (31 %): Relationship status, tobacco use, race/ethnicity, and body type. Otherwise stated, by and large liberals and conservatives do not differ in their assortative tendencies. Moreover, the mean score of nine of the thirteen assortation scales is significantly greater than the

Table 1 Characteristics of liberal and conservative daters

	Conservative	Liberal	Difference
Demographics			
Sex (Female)	44.4 %	64.9 %	−20.5 % ($t = -5.82$, $P < 0.01$)
Age (in years)	44.3	38.6	5.7 ($t = 5.94$, $P < 0.01$)
Race/ethnicity (White)	91.6 %	75.7 %	15.9 % ($t = 5.74$, $P < 0.01$)
Race/ethnicity (Black)	3.0 %	10.2 %	−7.2 % ($t = -3.77$, $P < 0.01$)
Race/ethnicity (Latino)	3.2 %	6.6 %	−3.4 % ($t = -2.06$, $P = 0.04$)
Education (1–6 scale)	2.93	3.61	−0.68 ($t = -6.95$, $P < 0.01$)
Income (1–7 scale)	3.39	3.29	0.10 ($t = 0.66$, $P = 0.51$)
Relationship status			
Never married	31.9 %	55.1 %	−23.2 % ($t = -6.55$, $P < 0.01$)
Parental Status			
Does not have children	38.0 %	55.1 %	−17.1 % ($t = -4.77$, $P < 0.01$)

Note: Education ranges from High School graduate to post-doctoral degree. Income ranges from less than $25,000 to greater than or equal to $150,001

Table 2 Covariates of assortative dating preferences

	Relationship status			Tobacco use			Race/ethnicity			Body type		
	All daters	Females	Males	All daters	Females	Males	All daters	Females	Males	All daters	Females	Males
Ideology												
Liberal	0.01 (0.03)	0.06 (0.04)	−0.05 (0.06)	0.03 (0.03)	<−0.01 (0.04)	0.10 (0.06)	−0.01 (0.03)	−0.06 (0.04)	0.07 (0.06)	−0.04* (0.02)	−0.01 (0.03)	−0.06* (0.02)
Conservative	0.05* (0.03)	0.06 (0.04)	0.05 (0.04)	0.06* (0.03)	0.04 (0.04)	0.08* (0.04)	0.01 (0.02)	−0.03 (0.03)	0.06* (0.03)	<−0.01 (0.01)	<−0.01 (0.02)	−0.01 (0.02)
Demographics												
Sex (Female)	0.04 (0.02)	–	–	0.06* (0.02)	–	–	0.06*** (0.02)	–	–	0.09*** (0.01)	–	–
Age	−0.002* (<0.01)	<0.01 (<0.001)	−0.01*** (<0.01)	<−0.01* (<0.01)	<0.01** (<0.01)	<0.01 (<0.01)	<−0.01 (<0.01)	<0.01 (<0.01)	<−0.01 (<0.01)	<0.01 (<0.01)	<0.01 (<0.01)	<0.01 (<0.01)
Race/ethnicity (White)	−0.08* (0.04)	−0.06 (0.05)	−0.10 (0.05)	0.03 (0.04)	0.01 (0.05)	0.05 (0.06)	0.28*** (0.04)	0.48*** (0.05)	0.10 (0.05)	−0.05* (0.02)	−0.08 (0.04)	−0.04 (0.03)
Race/ethnicity (Black)	−0.01 (0.05)	<−0.01 (0.07)	−0.01 (0.08)	0.07 (0.06)	0.02 (0.07)	0.13 (0.09)	0.14** (0.05)	0.36*** (0.07)	−0.07 (0.09)	0.01 (0.03)	<−0.01 (0.06)	0.01 (0.04)
Race/ethnicity (Latino)	−0.05 (0.05)	−0.07 (0.07)	−0.05 (0.07)	0.05 (0.06)	<−0.01 (0.10)	0.09 (0.07)	0.04 (0.05)	0.17* (0.07)	−0.03 (0.06)	−0.01 (0.03)	−0.03 (0.06)	<−0.01 (0.03)
Education	<0.01 (0.01)	−0.01 (0.01)	0.02 (0.01)	0.02* (0.01)	0.02 (0.01)	0.02 (0.01)	−0.01 (0.01)	0.01 (0.01)	−0.01 (0.01)	−0.01* (<0.01)	−0.01 (0.01)	−0.01* (0.01)
Income	−0.04*** (0.01)	−0.03* (0.01)	−0.04*** (0.01)	<0.01 (0.01)	0.02 (0.01)	<−0.01 (0.01)	−0.01* (0.01)	<−0.01 (0.01)	−0.02** (0.01)	>0.01 (<0.01)	0.01 (0.01)	<0.01 (<0.01)
Relationship status												
Never married	0.09** (0.03)	0.10* (0.05)	0.08 (0.05)	0.03 (0.03)	0.04 (0.05)	0.02 (0.05)	−0.01 (0.03)	−0.05 (0.04)	0.01 (0.04)	−0.01 (0.02)	−0.04 (0.03)	−0.01 (0.02)

Table 2 continued

	Relationship status			Tobacco use			Race/ethnicity			Body type		
	All daters	Females	Males	All daters	Females	Males	All daters	Females	Males	All daters	Females	Males
Offspring												
Does not have children	0.06	0.07	0.02	0.03	0.03	0.01	−0.03	−0.02	−0.05	0.02	<−0.01	0.03
	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)
Intercept	0.81***	0.73***	1.00***	0.57***	0.55***	0.65***	0.61***	0.45***	0.83***	0.78***	0.89***	0.76***
	(0.07)	(0.08)	(0.10)	(0.07)	(0.09)	(0.11)	(−0.06)	(0.08)	(0.09)	(0.04)	(0.06)	(0.05)
Adjusted R^2	0.20	0.11	0.29	0.02	0.02	0.01	0.11	0.20	0.05	0.09	0.08	0.04
N	597	317	280	826	382	444	819	415	314	765	241	524

Note: Cell entries are coefficients from least squares regression analyses (Imai et al. 2007a, b; 2008). Standard errors are listed in *parentheses*. Sample sizes vary due to omission of cases with missing data (i.e., "listwise deletion"). These are 12 separate models

* $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$

midpoint of 0.50 ($p < 0.01$), indicating that both liberals and conservatives generally prefer to date others who are like themselves.

This said, the four assortation scales that are predicted by ideology suggest that conservatives are less accepting of dissimilarity, a finding consistent with the extant literature (e.g. Jost et al. 2004). Moving from left to right in the table, there is a positive relationship between conservatism and positive assortation on relationship status (i.e., conservatives are more likely than liberals to desire a date who shares their relationship status). The same can be said of tobacco use (i.e., conservatives are more likely than liberals to desire a date who shares their tobacco usage). However, this relationship is only significant among men, and the size of the coefficient is marginal. The data also show that conservative males are also more likely to positively assort on race/ethnicity than liberal males (i.e., conservative males are more likely that a liberal males to want to date a female of their own race). Finally, at the far right-hand side of the table, we find a negative relationship between liberalism and body type (i.e., liberals are more open than conservatives to dating a person who does not share their body type). However, this relationship is only significant among males.

The other variables in the analysis offer additional insight into what types of individuals do or do not seek out dates who are like themselves. For example, with regard to relationship status, older, White, and more wealthy daters are more open to dating individuals with a different relationship status than their own. In contrast, those who have never been married are more likely to want to date someone else who has also never been married. The analysis of tobacco use shows that women and more well-educated daters tend to want a partner who shares their tobacco usage. In contrast, older daters are less likely to positively assort on tobacco use, perhaps because smoking was more acceptable in the past.[8] The results for race/ethnicity indicate that women, Whites, and Blacks are more likely to assort positively on race/ethnicity (the magnitude of this propensity is twice as large for Whites). Conversely, daters with larger incomes are more open to dating outside of their race. With regard to assortation on body type, women are more likely to desire a date who shares their physique than men. Conversely, White and more well-educated daters are more willing to date outside of their own body type.

Table 2 also highlights differences in the dating strategies of men and women. For example, looking across the row of Sex coefficients, we see that women are more likely than men to assort positively on tobacco use, race/ethnicity, and body type (the Sex coefficient for relationship status is also positively signed, though not statistically significant). In contrast, the numerous negative control variable coefficients in the male columns of Table 2 indicate that more often than not, males are more willing to date women who are different from them. The analysis of assortation on race/ethnicity also illustrates a salient difference in the dating strategies of men and women. The positive and significant White, Black and Latino coefficients for females indicate that women of all races assort on race. In contrast, the insignificant White, Black and Latino coefficients for males indicate

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[8] Also see Agrawal et al. (2006) for evidence of assortation on psychoactive substances.

that men, regardless of race, do not systematically seek to date women of their own race.

These examples of variation in mate choice aside, the main result from our data is that both liberal and conservative daters overwhelming seek partners who are more like themselves on almost all traits (Table 1), yet they do not appear to place as much weight on politics as would be expected in studies of mate assortation (e.g., Alford et al. 2011; Zietsch et al. 2011). This leads us to a possible solution to the puzzle of how long-term partners end up disproportionately matching on ideology, despite the finding that politics is not a salient aspect of the dating process (Klofstad et al. 2011), and couples do not substantially influence each other's political preferences over time (Alford et al. 2011; Martin et al. 1986). We propose that ideology may serve a two part function in facilitating similarity in mated pairs. First, as Table 2 shows, ideology appears to have a direct, but small, role in mate choice in some cases. Second, and more importantly, daters appear to sort on other traits which correlate with ideology (Table 1). As such, individuals may find their ideological matches by assorting on characteristics informed by the social environments where individuals reside, and these traits are related to political preferences in undefined yet systematic ways.

The Relationship Between Mate Choice and Polarization

What influence might this pervasive "like seeks like" tendency have on ideological polarization over time? To address this question, we conducted a simulation which estimates the change in the population variance of political ideology due to assortative mating on political ideology. More specifically, using the PedEvolve program explained in the "Data and Methods" section, we created generations of pedigree data (i.e. transmission of ideology from parents to children) through genetic, environmental, familial, and any other social or environmental source of transmission. That is, the program simulates individuals meeting, mating, and having offspring, who in turn meet, mate, and have offspring, for many generations, until the parameters in the simulation (i.e. estimates of the various sources of transmission) reach equilibrium.

In order to define the population structure at the start of the simulation, we rely on a real population assessed for ideology that is also one of the most extensive published data sets on parent–child, spousal, sibling and in-laws correlations for political attitudes, the "Virginia 30,000" (see Eaves et al. 1999). This population was studied in the 1980s, and remains one of the most informative data sets on extended kinships. Hatemi et al. (2010) conducted a nuclear family analysis of ideology on this data, estimating of the amount of variance (out of a standardized total of 1.0) attributed to genetic influence (0.577, and 0.343 for males and females respectively), unique person-specific environmental influences (0.014, and 0.013), shared sibling environmental influences (0.00, and 0.00), twin-specific environmental influences (0.012 and 0.054), direct parent to child social transmission (i.e., "vertical cultural transmission", 008 and 0.089), passive gene-environment covariance (012 and 0.160), and spousal concordance between mates ($r = 0.647$).
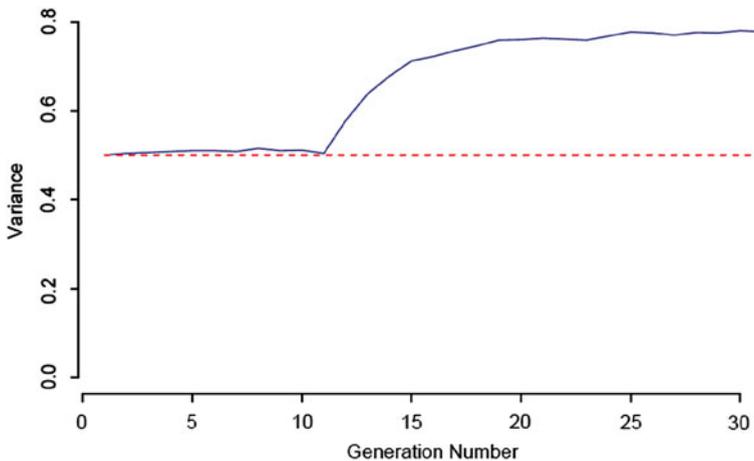
Fig. 1 Change in variance of ideology across generations due to assortative mating

We use these published estimates as the starting values of the population for the PedEvolve simulation.[9]

We begin the simulation by restricting the first 10 generations to random mating. That is, we assume that the population is not assorting on politics for the first 10 generations, but that transmission of ideology from one generation to the next remains a function of genetic, social, and environmental influences. We do this to illustrate how a population might change under a random mating assumption. After generation 10, we allow for assortative mating to occur to illustrate this behavior's influence on the same population's variance in political ideology. Figure 1 provides the change in total variance of ideology across generations. What is immediately clear is that there is little to no change in total variance until assortative mating is allowed (generation 11). Furthermore, the first 5 generations of assortative mating (generations 11-15) provide a remarkable increase in total variance of ideology. By generations 25-30, variance reaches an equilibrium. Any further generations after 30 provide no change in total variance. We allowed the simulation to run for 100 generations, and with the exception of small fluctuations that increase and decrease but return to the equilibrium, there is no further increase in variance.

The simulation results can also be represented as ideological location on a normally distributed liberalism-conservatism scale (Fig. 2). At Generation 0, liberalism-conservatism is normally distributed with only 4.5 % of the population falling in the tails beyond two standard deviations above or below the mean. Generation 1-10 (no assortative mating), is almost identical to generation 0. Once assortative mating is included, after only 5 generations (generation 15), there is marked increase in the number of individuals falling more than two standard deviations from the mean. By generation 25 the number of individuals falling more than ± 2 standard deviations from the mean had risen to 11.2 % of the population.

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[9] Additional studies on this sample and an Australian population report similar results (see Martin et al. 1986).
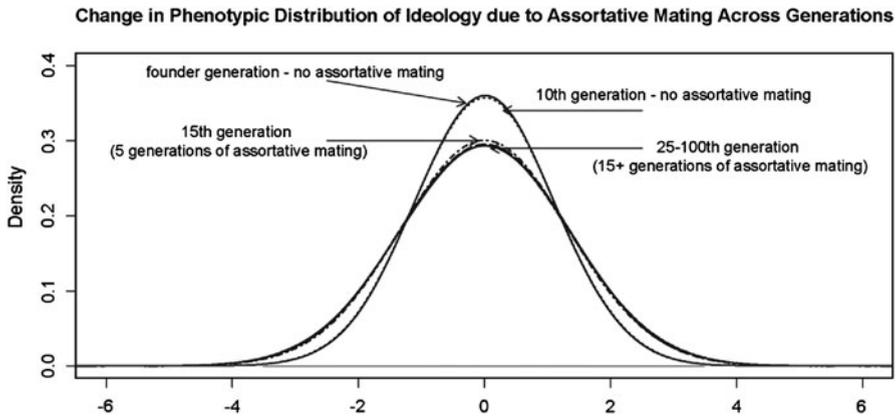
Fig. 2 Simulated change in the distribution of ideology over time due to assortative mating. *Source*: Simulations computed using PedEvolve© with estimates of genetic and environmental sources of variance and assortation from Hatemi et al. 2010 as the base population

In other words, if all things remain constant, the number of individuals in these extreme left and right ideological tails will be almost 2 times greater in 5 generations, and 2.5 times greater in 25 generations merely as a result of assortative mating, while the more moderate region between ±1 standard deviation saw a 17 % decline in the number of individuals. In contrast, the simulation under assumptions of random mating (generation 0 to generation 10) remained essentially unchanged.

In sum, with this simulation we compared the current assumption in the extant literature (no assortation) to assortation (which is happening) based on real population data. In this way, the simulation is much like an experiment, in that we only interject one stimulus (assortation) to show its effect, not to discount other important polarization (or depolarization) influences such as in-or out-migration, global events, shocks to the political and cultural system, economic collapse, and so forth. Nevertheless, the results of our simulation show that assortation on politics could play, or may already have played, an important role in the increase of political polarization. But it is important not to read too much into the simulation. Many forces can bring about changes in polarization, and we recognize that our results focus only on transmission from one generation to the next, holding all other factors constant, and assuming that modern society has not yet reached equilibrium.

Discussion

The Dating Strategies of Liberals and Conservatives

In line with the observation that positive assortation—"like seeks like"—is a common behavior in humans (Mare 1991; Vandenberg 1972), we find that both liberals and conservatives appear to gravitate toward those like themselves on a variety of demographic dimensions that are likely correlated with political preferences. Our findings suggest that positive assortation on non-political factors could lead to

inadvertent assortation on political preferences, and as a consequence inadvertently, yet systematically, heighten political polarization.

While the main result of our analysis is that positive assortation behavior is pervasive among liberals and conservatives alike, our data indicate a few cases where liberals and conservatives currently take different approaches to dating. For example, liberal daters are slightly more willing to date outside of their body type. Conversely, we find that conservative daters assort positively on relationship status and tobacco use. We also find that conservative males have a stronger preference to date within their race. Knowing that conservatives have historically tended to be less liberal on racial issues in politics (Cowden 2001), this result might not be surprising. However, this leads us to question why race is currently a dimension along which conservative males, not females, most strongly demonstrate such a desire. Unfortunately, we cannot answer that question with our data. Moreover, given that our data are cross-sectional, the differences between liberals and conservatives we have identified could change over time.[10]

Other Covariates of Dating Strategies

As one might expect, among all daters assortative dating is affected by the trait in question. For example, relationship status explains who does or does not seek a partner with the same relationship status. The same can be said of race. Otherwise stated, our sample is largely seeking co-ethnics and individuals who are in a similar phase of the life-cycle in terms of marriage (and, as such, perhaps procreation too). The dating profiles also show differences in the dating strategies of males and females, most of which indicate that females are the choosier sex (also see Todd et al. 2007). The most salient example of this tendency is seen in the analysis of assortation on race/ethnicity. Women, regardless of their race/ethnicity, seek to date co-ethnics, while males, with the notable exception of conservative males discussed above, do not systematically seek to date women of their own race or ethnicity.

The Role of Assortative Dating on Political Polarization

Assortation on politics appears to be a fairly modern phenomenon. This assumption, however, relies in part on the lack of any historical record indicating otherwise. Nevertheless, if this trend continues over successive generations, and the general meaning and salience of left–right orientations around political attitudes remains fairly consistent, and if we have not already reached equilibrium in the distribution of ideology among the American public, our computer simulation shows that political polarization will continue to widen over generations as a result of assortative mating. Because we do not know exactly when spouses began to assort on ideology to such a high degree, however, we cannot know for sure where to place our current generation within our polarization simulation. For example, if we consider each generation is born around every 25 years, and assume assortation on

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[10] At other points in time, other issues aside from race might have, or will, separate the dating preferences of liberals and conservatives.

ideology began in the 1960s, when studies first began to report high levels of spousal assortation in the modern political climate, and individuals assorted on ideology at the current rate, we should witness significant increases in polarization after only 2 generations, which would be around the present day (i.e. sometime between 2010 and 2020). If true, we should be able to identify an even larger increase in polarization after 5 generations (i.e. somewhere around 2085). Longitudinal analyses of extended pedigrees, tracking spousal assortation and political polarization, are required to further specify the simulation and confirm such results.[11]

Again, however, we note that the simulation does not include additional antecedents of political preferences, such as ethnicity, regional considerations, major shifts in the environment, or alterations to the political and natural world. These shifts may occur in numerous and subtle ways which may further hasten the speed of the assortative mating dynamics we witness in the simulation. For example, if conservative couples have more children than liberal couples, as some studies report (Sailer 2004), unless birth rates change, and liberals become more politically engaged at higher rates than conservatives to offset the population difference, the simulation may not fully capture the speed with this assortative mating might exert a noticeable effect on political outcomes.

This said, we also acknowledge that continued polarization is not inevitable. First, it is possible society has already reached equilibrium on ideology. That is, if spouses have actually been assorting on ideology for some time, even if that assortation has gone unmeasured, then an equilibrium may have already been met. This would be the case if modern day political orientations are correlated with other traits that spouses may have assorted on in the past, such as in-group loyalty or approaches to parental investment, that today appear as modern day political orientations. While this remains a possibility, it seems unlikely that such alignment would have occurred so perfectly over long periods of time across so many mating pairs, and yet remain unobserved until recently. Moreover, as stated earlier there are non-political characteristics which correlate with left–right orientations, but we have no evidence that would suggest that mates assorted on these traits much earlier on in human history. Rather, we rely on the assumption that assorting on political preferences is a modern phenomenon, and overall variance on ideology will increase (given all other conditions hold) until an equilibrium is met.

Second, we acknowledge that factors we have not yet observed could slow, or even reverse, the current trend of increasing political polarization. However, such factors would have to somehow operate despite the countervailing influence of positive assortation on political ideology. Importantly, as we noted above, society has or will reach equilibrium, and it is improbable if not impossible that polarization will continue until complete bifurcation.

In a related vein, we also recognize that mass political polarization has shifted over time in the United States from the more polarized discourse which characterized the progressive era a 100 years ago, to the more centrist positions advocated by the majority of the public through the middle part of the last century.

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[11] However, it is unlikely anyone of the three of us will be around to be proven right or wrong.

Increasing polarization seems to have re-emerged in the last 40 years, mainly at the elite and party level (Fiorina and Abrams 2008). However, we suggest that the reasons for the more recent polarization may differ, at least in part, from the more structural post-reconstruction era income distribution issues which divided the political spectrum in the last century.

More specifically, with increasing rates of female higher education, men have the opportunity, and perhaps motivation, to meet and marry women of higher education and earning potential, an option that was rarely available to most men a century ago. Likewise, as men and women meet within the context of higher education, political ideology may matter more in aligning preferences than in past environments where the male wealth-for-female beauty exchange dominated the mating trade (Bryan et al. 2011). It could also be that as women became more incorporated into the political system after gaining the right to vote in 1920, political preferences may have become a more important aspect of the courting process. Prior to this time, women's political views were unfortunately largely ignored, and as such their political opinions may not have entered into the mating process. However, to the extent that such political values correlated with some of the other trait characteristics spouses assorted on before women's suffrage, it remains possible that their views may still have indirectly affected prospects for assortative mating, especially through the operation of informal marriage brokers who matched on factors such as race or socio-economic status. Otherwise said, as the basis and opportunities for mating shift, the effects on offspring ideology may become more pronounced. Even if such effects remain subtle, systematic shifts of small percentages can swing elections. Nevertheless, the results of our simulation at the very least highlight the need to address the implications of assortative mating on models of political behavior, and motivate our empirical analysis.

Conclusions

Debates over contraception and the economy represent only a few of the many issues illustrating the widening gap between the ideological left and right in the United States. While there are a number of different explanations for this change in American politics, we suggest that human mate choice plays some role in this process. Spouses tend to share political preferences, and parents pass on their political preferences to their children.

This said, spouses do not influence each other's political preferences over the course of the relationship (Alford et al. 2011), and politics is not a salient factor at the outset of the dating process (Klofstad et al. 2011). To address this mystery, using a survey of online dating profiles we examined the dating preferences of liberals and conservatives. With a few exceptions, we find that both liberals and conservatives prefer to date others who are like themselves. And, the non-political traits that those on the left and right assort on do have some role in political assortation. For example, liberals seek out dates with more education, and conservatives with less, and education has been found to correlate with tolerance (e.g., Bobo and Licari 1989). Consequently, it could be that the pervasive practice of assortation on

non-political factors could be inadvertently leading to assortation on political preferences, which in turn leads to political polarization over time. To be clear, however, given that we found only a few differences in the dating preferences of liberals and conservatives, differences in dating preferences do not substantially account for the high degree of spousal assortation on political preferences. Thus the question remains as to how the political filtering process occurs as relationships progress from dating, to mating, to procreation, in which the transmission of genes influence political predispositions. Future studies are necessary to answer these questions.

In conclusion, and apropos of our data source, we have three observations on to how to address future research on political polarization and human mate choice. First, it is important to reiterate while the dating profile research design is frequently used in the study of human mate choice, our data are not a perfect representation of the process. As stated in the "Data and Methods" section, daters have incentives to misrepresent themselves in their profiles (Hall et al. 2010; Klofstad et al. 2011; Pawlowski and Dunbar 1999), which possibly leads to measurement error in our results. Moreover, while our data allow us to examine variation in mating preferences, we do not have the necessary information to assess how individuals prioritize the various characteristics they seek in a potential mate (see, e.g., Li et al. 2002). For example, with our data we can explain variation in daters' willingness to date outside of their own race, but we cannot assess how much a dater values coupling with a co-ethnic relative to a partner with great wealth or physical attractiveness.

Second, the process of transitioning from dating to mating, as daters consider countless factors (political and otherwise) as they sift through the dating pool, is more nuanced and complex than the information that can be captured in any delimited dating profile. For example, while we contend that assortation on political preferences could be an unintended by-product of assortation on other factors that correlate with political preferences, such as education or religion, the converse might also be true. That is, assortation on political preferences might cause us to assort on other factors that are correlated with political preferences. Or, it could be that both of these processes are simultaneously occurring as individuals cull through the dating pool. We also need to consider the possibility that these hypothesized processes are dependent upon the idiosyncratic characteristics of the dater (e.g., how salient politics is to the individual), and that of his or her environment (e.g., the ideological leanings of the available dating pool). Thus, while our findings offer us an important first-glimpse into the role that mate selection might have in the process of polarization, a more detailed longitudinal study of the transition from dating to mating is needed to gain a more complete understanding of this complex process.

Third, the increasing prevalence of Internet dating may hasten the process of assortation, and potentially political polarization as well, as individuals can easily select potential mates that are similar to themselves by searching through detailed profiles before investing the time and energy involved with courtship (Feliciano et al. 2009; Hitsch et al. 2010). This possibility raises a larger issue: people may select partners over the Internet along different dimensions, or in different ways, than they would in "real life." This issue deserves greater attention, as does further

inquiry into the psychological and political mechanisms people employ to find politically similar long term partners, and the ramifications that this has on politics.

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