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Abstract

Explanations for differences in political preferences between men and women continue to be debated, generating more heat than light in attempts to locate their source and potential influence. The reason for this confusion rests on the lack of conceptual clarity concerning the difference between sex, typically referring to biological differences, and gender, assumed to result from socialization, and the difference these constructs might elicit in political outcomes. Utilizing two gender scales, the authors find gender identity exerts an impact on voter preferences above and beyond sex. They also find that individual differences in gender identity are not found to result from social influences but largely derive from unique experiences and innate disposition. The results have substantial implications for social scientists who theorize about and investigate sex and gender in studies of political attitudes and behaviors.

Keywords

gender, genetics, voting, identity, personality

Men and women often exhibit predictable differences in political attitudes and behavior. Such divergences have formed the basis of demographic predictions in voting behavior since Lazarsfeld's early work (Berelson, Lazarsfeld, and McPhee 1954), although the common phrase *gender gap* did not enter the discourse until much later (Frankovic 1981). Indeed, much of the political discussion concerning past elections surrounds the demographics of how many, and what kind of, women supported particular kinds of candidates. This was most evident during the 2008 presidential election surrounding the demographics of which women supported Hillary Clinton or Sarah Palin.

A great deal of scholarship in both political science and psychology has addressed the sources and consequences of discrepancies in attitudes and behavior between men and women. But markedly few discussions explore potential distinctions between sex and gender in explaining either between-sex or within-sex differences in political preferences. In discussions where the concepts remain distinct, sex typically refers to biological reproductive status, while the notion of gender embraces a broad spectrum of dispositional differences and socially informed attitudes and behaviors. However, in the existing political science literature the meaning and influence of sex and gender are typically treated synonymously, and behavioral divergences associated with differences between men and women are assumed to result largely, if not exclusively, from processes of socialization (Eagly

and Steffen 1986; Jennings 2006). This perspective overlooks contemporary findings in the medical sciences (e.g., Bocklandt and Vilain 2007) that reveal that gender identity results in large part from biological influences, including in utero effects, and does not derive from the effects of socialization. Surprisingly little interrogation has surrounded the ways in which either concept might differentially inform or affect political behavior. Here we seek to help fill that lacunae and advance the discussion by differentiating some of the ways in which sex and gender produce different sources of variation in political behavior. We also explore the sources of gender and examine what an explicit distinction between the concepts of sex and gender might mean for political behavior. In doing so, we hope to gain some empirical grounding for the ways in which gender differs from sex and why these differences might establish more conceptually valid models explaining attitudinal and behavioral differences in both men and women.

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In contrast to the guiding principles of the discipline, we do not assume, *a priori*, that gender wholly results from processes of social construction. The common convention in political behavior research that labels “gender” in dichotomous terms reduces a quite complex intersection of both sex *and* gender into one discrete term. This practice confounds distinct traits by treating them as interchangeable and synonymous when there is no empirical basis for this fusing. Rather, we consider the possibility that individuals can manifest a propensity to either correspond to their gender stereotype or not, and to varying degrees, and that such differences hold predictive power for political preferences. Debate continues whether gender is a unidimensional construct, where masculinity and femininity reside on opposite poles of a single continuum (Lippa 2005; Rieger et al. 2008; Rieger et al. 2009), or consists of two unique constructs, such that individuals might be categorized separately and simultaneously on each dimension (Bem 1981). However, either way, masculinity and femininity do not emerge necessarily dichotomous.

It is important to decouple sex from gender in predictions of voting behavior because it is not clear that they predict the same outcome. Is a more masculine woman more similar in voting habits to a man or a woman? Is a more feminine man more likely to be a political nonconformist? The vast majority of political behavior research implicitly assumes that sex and gender represent commensurate and interchangeable measures for predicting political preferences or behaviors. Indeed, scholars typically explore sex as a predictor of political attitudes and preferences and then cease the exploration there. Research has largely neglected the way in which sex and gender may influence outcomes in divergent ways. However, this conundrum has received renewed attention; a recent report to the American National Election Studies proposed the introduction of measures to examine the overlap between sex and gender (Sanbonmatsu and Dolan 2007). Sex and gender may influence political attitudes and behaviors through different mechanisms, producing divergent outcomes; we seek here to empirically delineate the extent to which this might prove true.

Importantly, it is also critical to identify and distinguish the sources of gender if we are to avoid disastrous public policy choices and protect the freedoms and rights of individuals. One of the best known deterministic experiments was the storied case of the John–Joan sex reassignment performed by John Money (Money and Ehrhardt 1972). As a result of a wholehearted belief that gender could be socialized, Money encouraged the parents of a child who had sustained a botched circumcision to have his testicles removed and to be raised as a girl. Money claimed complete success for his ostensible medical triumph, and for over twenty-five years the case of

John–Joan was presented as proof that a child’s gender could be changed without consequence. Thousands of “sex reassignments” were performed, in part based on Money’s published findings. However, Diamond and Sigmundson (1997) followed up on John–Joan and showed the experiment to have actually been a disastrous failure (also see Colapinto 2000). Money failed to report that David Reimer, initially identified in the medical literature as John–Joan, struggled with his imposed gender identity all throughout childhood, and despite the incredible lengths to which Money and his parents worked to reengineer David, including immense social pressure and conditioning to act like and be a “normal” girl, David ultimately rejected the feminine roles imposed on him.¹ At age thirty-eight, David committed suicide. This case clearly demonstrated that no matter the degree of social pressures society exerts, gender or sexuality cannot be summarily reassigned. This example also poignantly demonstrates the practical and political consequences of imposing deterministic beliefs on people’s lives. If such work showing the independent biological influences on both sex and gender had been widely known in the 1970s, demonstrating that gender does not emerge from social conditioning, people like John Money could have been stopped from the reckless experimentation that resulted in the destruction of many lives.

The example above is important because although we have no desire to reenergize an atavistic debate concerning the artificial divide between nature and nurture, we do seek to explore the comingling of these forces that manifest in predictable psychological and political outcomes. If gender exerts an important political effect independent of sex, then most of our extant measures and models of political behavior based on biological sex remain imprecise, and possibly inaccurate, in their interpretation. This implication holds real-world applications because if different outcomes result depending on whether gender or sex is used as a variable, then predictions and interventions for a wide variety of phenomena that presumably differ according to biological sex will require reexamination.

Here we explore both sides of the interaction between the biological and environmental influences of sex and gender on political preferences first by examining the independent impact of gender on vote choice and second by exploring the nature of gender using a genetically informative sample of twins. We seek to investigate whether gender identity has a political impact independent of sex, where such an effect might originate, and how to better understand its influence. In this way, we delineate how biological and environmental factors can affect behavior through their influence on a range of psychological gender types that exist within both men and women. If, as we suggest, no empirical basis for fusing sex and gender in demographic predictions of political

outcomes of interest exists, the two concepts should be separated in future analyses of political behavior. Furthermore, if we find individual differences in gender are not significantly influenced by the familial environment, the concept of gender being purely social cannot be maintained. Indeed, there is no a priori reason to assume that the cultural stereotype of masculinity or femininity remains necessarily embodied within men and women, respectively. The fact that popular phrases exist to characterize such phenomena from youth, such as “tomboy” and “sissy,” indicates that society has some implicit understanding of the relationship between sex and gender identity. The extant literature in the psychological and life sciences supports this very intuition (Garcia-Falgueras and Swaab 2010).

We begin with a review of the relevant literature on gender and political behavior, which tends to focus largely on constructions of femininity and sociocultural elements, followed by a discussion of the psychological literature on sex and gender. We then introduce two separate gender measures, the Childhood Gender Nonconformity (CGN) scale and the Adult Gender Identity (AGI) scale, and examine their respective relationship to sex and their influence on voter preferences, followed by an exploration of the source of gender.

Sex and Gender in Political Science

Feminist scholars adopted the term *gender* to distinguish between *culturally* imposed characteristics associated with masculinity and femininity and *biological* features, labeled *sex*. A deep skepticism of scientific explanations for sex differences has been well founded and deemed politically necessary by those pursuing social and political equality between the sexes. By exemplifying variation in masculinity and femininity, scholars of gender sought to disprove biological determinism (Devor 1989) and ensure a conceptual distinction between sex and gender, implying that proper categorization can result wholly from either biology (*sex*) or socialization (*gender*). This position leaves little room for overlapping or interactive causality, intersections between biological sex and gender, or the mutually constitutive integration of characteristics. In her classic work investigating the power of sexuality, DeBeauvoir (1953/1993) argued that the very construct of female identity reified and instantiated important cultural positions of power between men and women, locating the sources of sexual status in those implicit assumptions of hierarchy embedded within notions of femininity. These categories are reinforced via stereotypes, identities, and social institutions. As interpreted by Butler (1990), gender becomes a manifestation of culture, whereby individuals, whether biologically

male or female, evoke responses from society based on the form and degree of their performative as well as experiential gender conformity. According to these theoretical treatments, gender represents an external cultural construction that has little or nothing to do with biology, except as others may project that identification and its associated stereotypes onto a putatively observed category.

Previous constructions have regarded sex as a biological description and gender as a primarily sociocultural phenomenon. But these two characterizations have not been empirically distinguished in the majority of the previous literature; most scholars have restricted their inquiry to either one category or the other, ignoring potential differences or interactions between them. Until recently, there has been little work attempting to delineate which aspects of biological sexual dimorphism, whether resulting from physiology, reproductive capacity, hormonal influence, or basic genetic structure, affect political preferences. Fewer still include gender differences separate from influences driven by sex or attempt to distinguish their differing influences on political preferences. As a result, most work in political science has typically focused on the impact of socialization in establishing links to political attitudes and behavior; as Sapiro (2003, 604) writes, “Relatively little research explores the impact of physiological variation associated with sex on politically relevant phenomena. . . . Most political psychology research involving gender focuses on socio-cultural sources.”

Such a sociocultural view has a long history in the literature (Campbell et al. 1960). Political scientists often make reference to the gender gap in voting behavior (Norrandner 1999), policy preferences (Shapiro and Mahajan 1986), policy outcomes (Swers 1998), leadership style (Rosenthal 1998), or who runs for office (Fox and Lawless 2004). Indeed, much of the literature on gender identity has examined these influences using large national survey data employing “sex” as a proxy for “gender” or simply inserting the word *gender* when *sex* was used in the analyses. In effect, sex and gender have been treated as the same indistinguishable reality.

Very little work has theoretically interrogated the critically important distinctions between sex and gender and their mutually interacting influence. Even fewer studies have explored the potential relationship between gender conformity and political conformity. Do those individuals whose gender identity deviates from their biological sex demonstrate a greater propensity for supporting nontraditional political parties as well? Furthermore, while the extant literature has examined the impact of a politicized gender identity and gender consciousness, it has done little to empirically identify whether innate influences, such as genes, might undergird either construct or serve as a foundation on which they mutually co-constitute.

Sex and Gender in Psychology

Decades of research in psychology has consistently shown three basic differences that individuals unconsciously categorize essentially instantly when meeting new people, beginning in infancy: age, sex, and race (Brewer and Lui 1989). While there is growing evidence that categorization of race can be “erased” in the face of contradictory coalitionary status (Kurzban, Tooby, and Cosmides 2001), no one has been able to find similar ways to eliminate the automatic distinction by sex, suggesting deeper psychological, possibly evolutionarily, categorization mechanisms are at play in such recognition. Kessler and McKenna (1978) assert that gender attribution constitutes the automatic process by which one person uses the classification of the physical sex of another to make assumptions regarding that individual’s traits that remain consonant with his or her culture’s gender stereotypes as a man or a woman. As such, gender constitutes a construct that cues trait attribution concerning what a man or woman is supposed to be like and guides subsequent social behavior toward him or her.

One of the most influential models in this area involves the “social role” theory of sex differences in social behavior. In this notion, men and women fall into certain patterns of behavior according to their sex that defines which activities and relationships they can pursue with social support or opprobrium. Over time, the sexual selection of individuals into particular tasks renders individuals more skilled through education and experience in some areas than others, such that women, for example, are more likely to become caretakers and men become wage earners. This theory emphasizes the influentially determinative role played by socialization in structuring various social outcomes, with little room remaining for any biological underpinnings of preferences or self-selection. For example, Eagly and Steffen (1986, 330) argue that sex differences in aggression “are a function of the perceived consequences of aggression that are learned as aspects of gender roles and other social roles.”

This area of work rests on implicit assumptions about the ways in which the socialization processes that reproduce the sexual divisions of labor define and determine sex differences seen in society. These divergences may rest on a foundation of biological differences related to reproductive capacity, but other differences in attitudes and behaviors are understood to result from a combination of internalizing societal norms and a kind of false consciousness concerning their immutability. Thus, differences in power and status result from the replication of power imbalances that traditionally have favored men. Concepts of gender and the space of the female body become the territory over which contentious values within society conflict. And yet theoretically these social

roles and value systems should be viewed separately from biological systems of reproduction even though the two remain inextricably intertwined. In this view, sex is biological, but it serves as the basis (or cue to self and others) for gender constructions, which are conceived as social roles and value systems on which male and female identity scaffold.

In seeking to delineate the distinction between the socially constructed meanings of masculinity and femininity, Bem’s work proved the most theoretically influential and certainty revolutionized the assessment of gender. Bem used two distinct scales, one for masculine and a second for feminine characteristics, such that individuals could be high on one and low on the other, high on both (androgynous), or low on both (undifferentiated). Bem’s gender schema theory posited the tendency for individuals to understand behavior from within the socialized rubric of sex-typed behaviors. She argued that this process served society’s insistence on the functional utility of such instantiated and hierarchical gender dichotomies.

However, Bem’s research remained controversial; many criticisms focused on the construct validity of Bem’s scales (Ballard-Reisch and Elton 1992), but more importantly her conceptualization of gender ran contrary to the prevailing thought that masculinity and femininity simply constituted opposite ends of a single scale (Terman and Miles 1936). Indeed, for some psychologists, gender still remains categorized as a bipolar construct, with one side related to masculine behaviors and the other to more prototypically feminine ones (Miller and Kottke 1993). More recent renditions of a unidimensional construct of masculinity–femininity suggest a repertoire of related behaviors, including interests, appearances, mannerisms, nonverbal behavior, and sexual orientation, which relate to this continuum (Lippa 2006).

While Bem’s political mission was questioned, her central idea of masculinity and femininity constituting two distinct constructs, rather than opposite sides of the same spectrum, heavily influenced the study of gender by recognizing the need to talk about “gender” existing within sex. Today, few challenge the suggestion that gender is different from sex.

Conceptualizing Sex and Gender as Distinct Constructs

The majority of the extant literature in political psychology suggests that gender is socially constructed, is something external to the individual, and is projected onto one’s biological sex by oneself and others. This process has historically disadvantaged females because their normative characteristics have traditionally been less valued by the wider male-dominated society. As the conception of gender, distinct from sex, is complex and difficult to

measure, it has often been ignored in applications to political attitudes and behaviors, which tend to prefer simplified demographic measures of sex in analyzing political preferences.

Disentangling the concept of sex from gender adds theoretical coherence, normative value, and possibly predictive power to the analyses of political preferences. The conceptual utility of gender also rests on a greater understanding of the *source* of gender. Remarkably, there is little, if any, work in political psychology that explores the concept of gender and gender nonconformity and its potential impact on political outcomes. To the extent that research exists in psychology, it has largely focused on the dynamics involved in sexuality. Likewise, the literature in political science intersecting the areas of gender studies and political behavior tends to focus on political tolerance. Here again, however, the debate concerns the role of women in general, with no distinction whatsoever drawn either on the basis of gender as distinct from sex or on the ways in which gender might potentially affect political choice in systematic or predictable ways that differ from the demographic impact of sex. Here, we begin to fill these gaps by exploring the different profiles of gender and sex and examining the source of gender, with a view toward investigating whether, and how much, gender results from a process of social construction or develops in unison with inherent dispositions.

Method, Analysis, and Results

Participants were recruited from the Australian National Health and Medical Research Council Twin Register, developed from a volunteer population-based registry, supplemented by birth records. The sample is representative of the Australian population with three exceptions: there is a greater proportion of women, the median age is thirty-one years, and the sample has a higher level of education than does the overall population (Dunne et al. 1997). Twins aged between seventeen and fifty-two years who had completed a Health and Lifestyle Questionnaire in 1990 (9,112) were contacted in 1991-92 about their willingness to receive an additional questionnaire regarding detailed sexual behaviors, gender, and personality measures (Bailey, Dunne, and Martin 2000). Of those able to be contacted, 54 percent (1,824 males and 3,077 females) completed the survey. Comparison of participants to the initial survey to those who opted out from the follow-up identified a modest participation bias. Generally, participants were higher in novelty seeking, were lower in harm avoidance, and reported an earlier age of first sexual intercourse than those who declined to participate. Because the sample is composed of siblings, analyses are clustered by family when appropriate.

Measures

Two separate gender identity measures were used: The CGN scale and the AGI scale. CGN is composed of twenty-three self-report items retrospectively assessing childhood sex-typed behavior (i.e., participation in sex-stereotypic activities before the age of thirteen). Separate scales were developed for males and females (see tables 1 and 2). The measure was an adaptation of the Gender Identity Scale for Males (Freund et al. 1977), the Childhood Play Activities Checklist (Grellert, Newcomb, and Bentler 1982), the Recalled Childhood Gender Behaviors Questionnaire (Mitchell and Zucker 1992), the Physical Aggressiveness Scale (Blanchard et al. 1983), and the Masculine Gender Identity Scale (Blanchard and Freund 1983). A single general factor primarily accounted for the item intercorrelations ($\alpha = .82$ for males, $.85$ for females).

The second gender measure is the AGI scale (see Finn 1987). The items assessed participants' current self-perception of masculinity or femininity (i.e., present internal feelings of maleness or femaleness) using a dichotomous response option of yes or no to seven questions. Questions differed slightly for males and females (see table 3). Separate analyses for each sex were consistent with a single factor ($\alpha = .71$ for males and $.73$ for females; see Zietsch et al. 2008). Items were summed to give a total score and were standardized to range from 0 to 1, with 1 being perfectly conformant to one's gender identity. Because this study examines gender and not sexuality and to reduce the possibility of confounding gender with sexuality, only heterosexuals (self-reported) were included in the analyses. This is not to say that sexuality is an unimportant part of one's identity or conformity to societal gender stereotypes; however, in this initial exploration, to gain some traction on the concepts of masculinity and femininity, we restrict our analysis to that initial categorization here. AGI is correlated with CGN $.300$ for males and $.447$ for females ($p < .001$).

Ideally, our sample would include a wide range of political traits. However the study was designed specifically to measure personality, gender, and sexual preferences, and because of the sensitive nature of the questions, an institutional ethics review did not allow this study to be combined with other political measures. As a result, only one political question was available for the study, *voter preference*. Fortunately, this variable constitutes one of the most important variables for scholars interested in political outcomes in Western democracies.

The Australian political system is a parliamentary system. The Liberal and National Parties form a permanent coalition, aptly named the "Coalition," which represents a more right of center and politically conservative electorate. The Liberal Party draws its base from the urban

Table 1. Childhood Gender Nonconformity: Females

Question	Answer options
As a child, did you prefer to play with . . .	Boys/Didn't make any difference/Girls/Alone/Don't remember
As a child, did you like inside chores such as cooking, sewing, and cleaning house, or outside chores such as mowing the lawn, working on automobiles, and house painting?	Inside chores/Outside chores/Liked or disliked them equally/Don't remember
As a child, were you interested in playing with dolls?	Yes/No/Don't remember
In childhood (between ages 3 and 12) were you very interested in the work of a garage mechanic?	Yes/No/Don't remember
As a child, which did you like more, romantic stories or adventure stories?	Romantic/Adventure/Made no difference
Before age 13, when you read a story did you imagine that you were the male in the story the female in the story?	Male/Female/Sometimes male sometimes female/Neither/Didn't read stories
As a child, did you sometimes imagine yourself as being the courageous leader of others?	Yes/No/Don't remember
As a child, did you ever wish you had been born a boy instead of a girl?	Often/Occasionally/Never
As a child, did you sometimes imagine or fantasize about physically defending someone against a monster, a dangerous animal or "evil" people?	Yes/No/Don't remember
In childhood fantasies did you sometimes wish you could go hunting big game?	Yes/No/Don't remember
In childhood, did you wish you would become very strong physically?	Yes/No/Don't remember
In childhood was there ever a period in which you wished you would, when adult, become a dressmaker or dress designer?	Yes/No/Don't remember
In childhood fantasies did you sometimes imagine yourself driving a racing car?	Yes/No/Don't remember
In childhood, did you ever wish to become a dancer?	Yes/No/Don't remember
In childhood, did you ever wish to become a pilot, or did you fantasize about being a pilot?	Yes/No/Don't remember
As a child, did you have the reputation of a "tomboy"?	Often/Occasionally/Never
As a child, compared to other girls your age did you feel . . .	Much more masculine/Somewhat more masculine/Equally masculine/Somewhat less masculine/Much less masculine
As a child, compared to other girls your age did you feel . . .	Much more feminine/Somewhat more feminine/Equally feminine/Somewhat less feminine/Much less feminine
As a child, did you . . .	Always feel good about being a girl (or never thought about how you felt)/Usually feel good about being a girl/Rarely feel good about being a girl/Never feel good about being a girl
As a child did you enjoy wearing dresses and other "feminine" clothes?	Yes/I did not particularly enjoy it but I didn't mind it either/I disliked wearing such clothes/Don't remember
As a child, did you ever have the secret desire to be a boy?	Frequently/Occasionally/Rarely/Never
As a child, did you ever tell anyone that you wanted to be a boy?	Frequently/Occasionally/Rarely/Never
As a child, did you enjoy experimenting with cosmetics and jewelry?	Yes/No/I never did this/Don't remember

Respondents were directed to "Please answer the following questions regarding your behaviour in childhood, before age 13" when answering the above questions. The first general factor accounted for 31.29 percent of the variance.

areas and economic conservatives, and the National Party draws its base from more rural areas and religious conservatives. This Coalition campaigns together and works strategically to compete against the Australian Labor Party (Labor), which identifies with the working class and has a left of center social democratic agenda.

The most significant minor party at the time of the survey was the Australian Democratic Party (Democrats), which reached its peak in terms of voter support (over 11 percent in the federal election) during the period in which the survey was administered. One of the Democrats' core philosophies was "all Australians should be able to live a

Table 2. Childhood Gender Nonconformity: Males

Question	Answer options and scoring
As a child (before the age of 13) were you ever bullied or pushed around by another boy of about your own age?	Never/Yes once or a few times/Yes several times/Yes many times/ Do not recall
As a child, when watching or playing sports, did you shout and yell?	More than other boys around you/As much as other boys/Less than other boys/Cannot say
As a child, how would you rate your skill in throwing a ball compared to other boys your own age?	Much above average/Above average/Average/Below average/Much below average
As a child, were you more afraid of males than of females?	Yes/No/Equally afraid or unafraid of both
When you were a child, what would you do if another boy your own age punched, shoved, or kicked you for no reason?	Inform a teacher parent or other adult/Run away/Do nothing or ignore it/Warn him that you were ready to fight if he did it again/Punch shove or kick him without further discussion
Did you prefer team sports (such as cricket or football) or individual sports (such as swimming, tennis, or gymnastics)?	Team sports/Enjoyed both equally/Individual sports/Disliked both equally/Cannot say
In childhood, did you enjoy the occasional fistfight with another boy your own age?	Yes/No/You were not involved in enough fights to give an answer/ Don't remember
As a child, did you feel nervous or uncomfortable around other boys your own age?	Never/Rarely/Frequently/Always/Cannot say
Did you ever feel afraid of being accidentally hurt while playing team sports for example, being struck with a ball?	Never/Occasionally/Frequently/Constantly/Did not play any team sports as a child
When you were a child, did you ever avoid a boy or group your own age because you were afraid of being teased or harassed?	Never/Yes once or a few times/Yes several times/Yes many times/ Do not remember
If you knew someone was waiting for a fight after school, would you have . . .	Taken another route home/Walked right past him and hoped it wouldn't come to a fight/Made a point of getting the first punch in/Don't know
When you were a child, were you ever ridiculed by other boys your own age for your performance in team sports?	Never/Rarely/Frequently/Constantly/Did not play team sports as a child
As a child, did you prefer to play . . .	With boys/With girls/Didn't make any difference
As a child, were you interested in playing with dolls?	Yes/No/Don't remember
As a child, did you like inside chores such as cooking, sewing, and cleaning house, or outside chores such as mowing the lawn, working on automobiles, and house painting?	Removed question because of answer options presented: Yes/No/ Don't remember
As a child did you like romantic or adventure stories more?	Romantic/Adventure/Made no difference
As a child, were you a leader in games or other activities?	More often than other boys/Less often than other boys/About the same or don't know/Did not participate
Before age 13, when you read a story did you imagine that you were the male in the story or the female in the story?	Male/Female/Sometimes male sometimes female/Neither/Didn't read stories
As a child, did you ever wish you had been born a girl instead?	Often/Occasionally/Never
As a child, did you ever put on women's clothing or underwear?	Once a month or more/Less often but several times/Very seldom/ Never/Don't remember
As a child, compared to other boys your age, did you feel . . .	Much more masculine/Somewhat more masculine/Equally masculine/Somewhat less masculine/Much less masculine
As a child, did you have the reputation of a "sissy"?	Often/Occasionally/Never
As a child, did you . . .	Always feel good about being a boy (or never thought about it)/ Usually feel good about being boy/Rarely feel good about/Never feel good about being a boy

This scale differs from its initial assessment in Bailey, Dunne, and Martin (2000) and Dunne et al. (2000). Coding of variables was corrected; for example, question 15 for males was removed from the analyses because of an error in the answer options that made the question unintelligible. The first general factor accounted for 32.17 percent of the variance.

Table 3. Adult Gender Identity

Females	Males
I often wonder what it would be like to be a man	I often wonder what it would be like to be a woman
In many ways I feel more similar to men than to women	In many ways I feel more similar to women than to men
People think I should act more feminine than I do	In general, I understand women better than men
I feel like part of me is female and part of me is male	I feel like part of me is male and part of me is female
I often think I would rather be a man	It would be fun to go to a costume party dressed as a woman
At times people in stores and restaurants have mistaken me for a man	I often think I would rather be a woman
I pride myself on being feminine	I don't feel very masculine

Answer options were "yes" and "no."

life free from discrimination, vilification, violence and harassment no matter who they are" (Bartlett 1998). They were viewed as more economically conservative but less socially conservative than Labor, particularly on decriminalizing homosexuality. They do not position on a left-right dimension consistently and exist in the analyses under the "minor/major" party label. In this sample, 44.6 percent supported the Coalition (Liberal-National), 40.3 percent endorsed Labor, and just over 15.0 percent advocated a "third" minor party, largely consisting of the Democrats.

Gender and Political Behavior

Gender roles and stereotypes are prescribed to one sex or other for a reason; for the majority they hold true and possess social power. This matters to the extent that we can demonstrate that divergence holds predictive power for voter preferences and political nonconformity. For CGN, 70 percent of males and 55 percent of females are within one standard deviation of the mean, while 90 percent of males and 85 percent of females are within one standard deviation of the mean for AGI. That is, most individuals' gender identity conforms to their sex, while childhood nonconformity has greater variation and is more normally distributed (see Web Appendix A at <http://prq.sagepub.com/supplemental/>). While complete overlap between gender and sex would not necessarily be expected, neither would a wider divergence in these rates seem reasonable.

In a simple test of whether gender taps into a different dimension than sex in predicting political traits, in our sample sex (a dichotomous variable of male or female) is only feebly correlated ($r = .04$, $p < .05$) with voter

preference (Coalition or Labor Party). Sex also has little to do with support for third parties versus the major political parties; the correlation is not significant and approaches zero. However, AGI is significantly correlated ($p < .001$) with voter preference and has a much stronger relationship to the left-right voter spectrum (.11 and .10 for males and females, respectively). This holds equally true for minor party versus major party support. CGN, on the other hand, appears to have no relationship with voter preference on the left-right spectrum but is significantly ($p < .01$) correlated with whether one votes for a minor party (.14 and .11 for males and females, respectively; see Web Appendix B).

Further insight is garnered by simultaneously accounting for the effects of gender and sociodemographic vote choice predictors. Several important correlates were available in the study, including age, self-reported education, mother's education, father's education, and social class (categories and correlations between covariates are in Web Appendix C). We initially performed analyses separately by sex. Table 4 presents results from regressing (logit) support for the Coalition or the Labor Party or support for a major versus minor party on CGN, AGI, and covariates. Whether one is male or female, AGI influences vote choice between the left-right spectrum and between major versus minor party support. That is, the more "feminine" males are or the more "masculine" females are, the higher the probability they will support the more left-leaning Labor Party.

Regarding CGN, there is no significant relationship with voter preference between parties on the left-right spectrum. However, CGN does have a significant influence on vote choice between major and minor parties. That is, the more one does not conform to one's sex norms during childhood, the higher probability one will grow up to be a "political nonconformist" and support a minor party.

Men who were not gender conformant in childhood are much more likely to support a minor party (table 4). The Democrats, the largest minor party at the time, offered the greatest support of gay and minority rights during the time of the study. Although our sample excluded self-identified homosexuals to assess the effect of gender specifically, it should not be surprising that gender nonconformists might have suffered some of the same social sanctions visited against homosexuals, making such individuals most sensitive to the importance of supporting gay rights. Thus, although our participants did not self-identify as homosexuals themselves, their own nonconformity in sexual identity stereotype likely encouraged them to support protection for those who espoused non-traditional sexual orientations.

The utility of the analyses can be extended by combining male and female respondents and exploring interactions among AGI, CGN, and biological sex. However, while

Table 4. Effects of Gender Identity and Nonconformity on Vote Choice within Sex

Predictor	Males (labor vs. coalition)			Females (labor vs. coalition)			Males (minor vs. major)			Females (minor vs. major)		
	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio
Adult gender identity	1.55***	0.39	4.70	1.27***	0.35	3.55	1.52***	0.40	4.58	1.29***	0.24	4.19
Childhood gender nonconformity	0.07	0.57	0.93	0.38	0.34	0.68	2.46***	0.69	11.73	0.11*	0.06	1.11
Age	0.01	0.01	1.01	0.01	0.01	1.01	0.02*	0.01	1.02	0.01***	0.00	1.03
Education	-0.18***	0.04	0.83	-0.05	0.03	0.95	-0.04	0.05	0.96	-0.10***	0.02	0.84
Mom's education	0.11*	0.05	1.12	0.06*	0.04	1.06	-0.05	0.05	0.95	0.08	0.03	0.94
Dad's education	-0.029	0.04	0.97	-0.05	0.03	0.95	-0.04	0.05	0.96	-0.05	0.02	0.98
Social class	0.93***	0.14	2.54	0.81***	0.11	2.24	0.02	0.17	0.98	0.85*	0.08	1.36
Constant	-2.59***	0.57	0.08	-2.18***	0.40	0.11	-1.38*	0.67	0.25	-2.41	0.29	0.77
Percentage correctly classified	60.7			60.2			85.6			84.10		

Labor is coded 0 and coalition 1; adult gender identity and childhood gender nonconformity are coded with 0 being nonconformant and the highest category as more consistent with one's sex.

* $p < .05$. *** $p < .001$.

the gender scales are designed to measure the same construct, they are not exactly the same for males and females, and combining males and females in the same analyses could introduce bias. Therefore, we tested for measurement invariance across sexes using a structural model by examining the factor loadings (the regression coefficients in the structural models for predicting item responses from the latent variable) and found that AGI and CGN are measurement invariant. That is, the latent variables for AGI and CGN are related to the items in the same way across sexes.

Table 5 presents the results of models that regressed Labor–Coalition voter support on CGN, AGI, covariates, sex, and interactions. AGI has an independent effect on support between Labor and the Coalition, while sex is not significant. Comparing only main effects models using a $-2 \log$ likelihood chi-square test, the best fitting model is one that includes only AGI and removes both sex and CGN (model 4). There are no significant interactions among sex, AGI, and CGN regarding their influence on Labor–Coalition voter preference (models 5–7).

Similar to the within-sex analyses, CGN however is important for political nonconformity. When simultaneously modeling AGI, CGN, sex, and covariates for third party support, sex is again not significant. However, both AGI and CGN are. Comparing only main effects models, model 1, which includes both AGI and CGN, is the best fitting model (table 6). However, there are two significant interactions that predict vote choice between minor and major parties. The interaction between AGI and CGN is significant, but the effect is not substantial in comparison to the main effects of AGI and CGN individually. The interaction between sex and CGN is significant, meaning that male nonconformists vote for minor parties more often.

In this population in Australia during the early 1990s, gender identities have a modest but significant influence on voter preference, independent of sex. When simultaneously accounting for the effects of gender and sex, gender identities constitute a better predictor of voter preference than sex. In particular, AGI adds predictive value to the choice between parties on the left–right spectrum and third party support, while CGN adds predictive value to third party support. The findings suggest that sex cannot be used as a reliable proxy for gender with regard to anticipating voter preferences and different measures of gender have different explanatory value.

The Source of Gender

Simply including a gender scale may offer potentially better predictive ability regarding vote choice but indicates nothing about which characteristics gender embodies or where it originates. Yet locating the etiology of gender is fundamental to the theoretical, methodological, practical, and ethical utility of the concept in analyses of political behavior. Explorations in the psychological, medical, and behavioral sciences provide support for the argument that gender identity, without question, does not derive purely from social construction. For example, during development, the normal male fetus secretes testosterone, which has dramatic effects on the development of reproductive organs as well as a significant influence on brain development. Exposure to testosterone during critical developmental periods is associated with long-term differences in behavior, including patterns of gender identification pushing both males and females toward the “male” type (Gorski 2002).

Table 5. Effects of Gender Identity and Nonconformity on Vote Choice (Coalition vs. Labor)

Predictor	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7		
	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio
Adult gender identity (AGI)	1.38***	0.26	3.99	—	—	—	—	—	—	1.29***	0.24	3.62	1.40***	0.26	4.06	1.39***	0.26	4.00	1.43***	0.27	4.20
Childhood gender nonconformity (CGN)	0.32	0.29	0.72	0.27	0.26	1.31	—	—	—	—	—	—	0.28	0.29	0.75	0.19	0.33	0.82	0.31	0.29	0.73
AGI x CGN interaction	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sex	0.04	0.07	0.97	0.10	0.07	0.90	-0.10	0.07	0.91	—	—	—	0.04	0.07	0.96	0.04	0.07	0.96	0.02	0.08	0.98
Sex x AGI	—	—	—	—	—	—	—	—	—	—	—	—	0.21	0.25	1.23	—	—	—	—	—	—
Sex x CGN	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.25	0.31	1.29	—	—	—
Age	0.01*	0.00	1.01	0.01*	0.00	1.01	0.01*	0.00	1.01	0.01*	0.00	1.01	0.01	0.00	1.01	0.01	0.00	1.01	0.01	0.00	1.01
Education	-0.10***	0.03	0.90	-0.11***	0.02	0.90	-0.10***	0.02	0.89	-0.10***	0.02	0.90	-0.10***	0.03	0.90	-0.10***	0.03	0.90	-0.10***	0.03	0.90
Mom's education	0.08**	0.03	1.09	0.09***	0.03	1.09	0.09***	0.03	1.09	0.08**	0.03	1.09	0.08**	0.03	1.09	0.08**	0.03	1.09	0.08**	0.03	1.09
Dad's education	-0.05*	0.02	0.95	-0.05*	0.02	0.95	-0.05*	0.02	0.95	-0.05*	0.02	0.95	-0.05*	0.02	0.95	-0.05*	0.02	0.95	-0.05*	0.02	0.95
Social class	0.85***	0.08	2.34	0.88***	0.08	2.40	0.88***	0.08	2.41	0.85***	0.08	2.34	0.85***	0.08	2.34	0.85***	0.08	2.34	0.85***	0.08	2.34
Constant	-2.25***	0.32	0.11	-1.49***	0.27	0.22	-1.31***	0.20	0.27	-2.41***	0.29	0.09	-2.29***	0.32	0.10	-2.36***	0.34	0.09	-2.32***	0.33	0.10
-2 log likelihood	4405.44			4596.02			4597.12			4407.034			4406.74			4405.77			4406.38		
χ^2 p value	.807			< .001			< .001			.45 vs. model 1											
Percentage correctly classified	60.5			58.0			57.4			60.5			60.5			60.5			60.5		

Model 1 is the full model with no interactions; model 2 removes AGI; model 3 removes AGI and CGN; model 4 removes CGN and sex; models 5-7 include interaction terms for Sex x AGI, Sex x CGN, and AGI x CGN, respectively. Sex is coded 0 for female, 1 for male. Labor is coded 0 and coalition 1. AGI and CGN are coded with 0 being nonconformant and the highest category being more consistent with one's sex. *p < .05. **p < .01. ***p < .001.

Table 6. Effects of Gender Identity and Nonconformity on Vote Choice for Major versus Minor Parties

Predictor	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7		
	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio	B	SE	Odds ratio
Adult gender identity (AGI)	1.48***	0.27	4.41	—	—	—	1.79***	0.25	5.97	—	—	—	1.51***	0.27	4.54	1.48***	0.27	4.39	1.61***	0.28	5.02
Childhood gender nonconformity (CGN)	0.90***	0.35	2.46	1.59***	0.31	4.90	—	—	—	—	—	—	0.96***	0.35	2.62	1.45***	0.40	4.27	1.01***	0.35	2.74
AGI × CGN interaction	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.08*	1.27	0.05
Sex	0.16	0.10	1.17	0.09	0.09	1.09	0.19	0.15	1.01	0.12	0.09	1.13	0.18	0.10	1.20	0.20*	0.10	1.23	0.24*	0.10	1.27
Sex × AGI	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.25	1.32	—	—	—	—	—	—
Sex × CGN	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Age	0.03***	0.01	1.03	0.03***	0.01	1.03	0.03***	0.01	1.03	0.03***	0.01	1.03	0.03***	0.01	1.03	0.03***	0.01	1.03	0.03***	0.01	1.03
Education	-0.13***	0.03	0.88	-0.14***	0.03	0.87	-0.13***	0.03	0.87	-0.15***	0.03	0.86	-0.13***	0.03	0.88	-0.13***	0.03	0.88	-0.13***	0.03	0.88
Mom's education	-0.06	0.03	0.94	-0.07*	0.03	0.93	-0.06	0.03	0.94	-0.07*	0.03	0.93	-0.06	0.03	0.94	-0.06	0.03	0.94	-0.06	0.03	0.94
Dad's education	-0.03	0.03	0.97	-0.03	0.03	0.97	-0.03	0.03	0.97	-0.03	0.03	0.97	-0.03	0.03	0.97	-0.03	0.03	0.97	-0.03	0.03	0.97
Social class	0.18	0.11	1.20	0.19	0.10	1.21	0.18	0.11	1.20	0.20*	0.10	1.22	0.18	0.11	1.20	0.19	0.11	1.21	0.19	0.11	1.21
Constant	1.43***	0.27	4.18	1.43	0.26	4.16	1.43***	0.26	4.18	1.39***	0.26	4.01	1.43***	0.26	4.16	1.36***	0.27	3.88	1.35***	0.27	3.87
-2 log likelihood	3171.48			3314.894			3198.12			3340.94			3170.24			3163.69			3165.48		
(N = 3,311)																					
χ^2 p value				<.001 vs. model 1			<.001 vs. model 1			<.001 vs. model 1			<.001 vs. model 1								
Percentage correctly classified	84.9			85.0			82.3			78.7			85.0			85.0			85.0		

Model 1 is the full model with no interactions; model 2 removes AGI; model 3 removes AGI and CGN; model 4 removes CGN and sex; models 5-7 include interaction terms for Sex × AGI, Sex × CGN, and AGI × CGN, respectively. Sex is coded 0 for female, 1 for male. Labor is coded 0 and coalition 1. AGI and CGN are coded with 0 being nonconformant and the highest category being more consistent with one's sex. * $p < .05$, *** $p < .001$.

As with any other complex social behavior, gender identity likely results from a combination of genetic precursors in combination and interaction with a wide array of environmental cues and hormonal triggers, which are particularly sensitive during fetal and neurological development and perhaps puberty. Gender identity fundamentally represents an individual disposition or collection of attitudes about oneself, constituting an important part of one's identity (Abdelal et al. 2006). The extent to which an individual adheres to, or diverges from, the norms typically associated with their sex (Bem 1974) constitutes a fundamental aspect of personality, in many ways resistant to change and relatively impervious to the vast majority of attempts to diminish its recognition and categorization. In this way, gender identity rests on more than learned adherence to a socialized gender schema but rather may emerge, at least in part, as a result of underlying genetic factors and influences.

Thus, it is worth exploring the extent to which gender identity (i.e., a coherent set of attitudinal and personal predispositions) may also be genetically influenced by yet differ from, or be similar to, biological sex (i.e., physical identification).

Estimating Environmental and Genetic Influences in Gender

Biometric genetic modeling provides one means of clarifying the concept of gender by explaining the sources of individual variation. By sampling individuals who differ in their genetic similarity but grow up in the same environment, such as monozygotic (MZ) and dizygotic (DZ) twins reared together, variation in complex behaviors can be partitioned into some combination of genetic and environmental influences, commonly known as variance components modeling. This is true because MZ twins are genetically identical, whereas DZ twins share on average 50 percent of the genes transmitted from their parents (Medland and Hatemi 2009). In these models, genetic influences are either additive (A), where all potential genetic effects are combined, or nonadditive (D). Nonadditive genetic influences arise from interactions either within a gene (*dominance*) or between genes (*epistasis*). Environmental influences are partitioned into common environmental influences (C), which include those shared among family members, such as familial socialization and shared in utero environments, and specific unique environment influences (E), which include aspects of the environment that are unique to the individual, including personal experience and hormones introduced in utero that are not common to both siblings. Indeed, when twins share the same womb, one twin inevitably receives "more" resources,

whether nutritional or hormonal. This holds true for gender identity: "During the intrauterine period the fetal brain develops in the male direction through a direct action of testosterone on the developing nerve cells, or in the female direction through the absence of this hormone surge. In this way, our gender identity (the conviction of belonging to the male or female gender) and sexual orientation are programmed into our brain structures when we are still in the womb" (Swaab and Garcia-Falgueras 2009, 17).

For CGN and AGI, the MZ co-twin correlations were much higher than those of DZ twin pairs, suggesting that familial aggregation for both constructs can better be explained by the inclusion of genetic influences (for more details, see Web Appendix D). However, there were important differences between the patterns of correlations for the CGN and AGI scales. Twin correlations for the AGI scale accord with an additive genetic model because the DZ correlations are roughly half the MZ correlations. In contrast, for CGN, MZ twin pair correlations are much greater than twice the DZ twin pair correlations, suggesting the presence of nonadditive genetic influences (for more on nonadditive genetic influences, see Web Appendix E).

Correlations alone cannot separate environmental influences into those that are common to the family and those that remain unique to the individual or identify which combination of additive genetic (A), nonadditive genetic (D), common environmental (C), and unique environmental (E) influences best fits the data. To quantify more precisely the sources of genetic and environmental variance, structural equation models tailored for genetically informative twin data provide fit statistics for deciding which combination of parameters (ACE, ADE, AE, CE, or E) is the most parsimonious explanation for observed patterns of MZ and DZ twin pair correlations. These models also estimate the size of the genetic and environmental parameters. The ACE or ADE models were compared against nested submodels (AE, CE, DE, and E) using a likelihood ratio chi-square statistic between the full and nested models. If the change in chi-square is not significant, then the nested model is said to provide a more parsimonious explanation of the data. Alternately, if the change is significant, then the parameters are said to represent effects that are significant to the contribution of individual differences and therefore ought to remain in the model. Sample-size-adjusted Akaike's information criterion was also used as an index of fit to judge the best model. Univariate genetic models of the CGN and AGI scores were fit using maximum likelihood estimation in Mx 1.60. The basic path model for twin resemblance is represented in Web Appendix F and described in detail by Medland and Hatemi (2009).

Table 7. Standardized Variance Components Model Fitting for Childhood Gender Nonconformity and Adult Gender Identity

Model	Parameter estimates														$\Delta\chi^2$	Δdf	AIC	p value
	Females							Males										
	a ²	95% CI	c/d ²	95% CI	e ²	95% CI	a ²	95% CI	c/d ²	95% CI	e ²	95% CI						
Childhood gender nonconformity																		
Full model (ACE)	.35	.16-.68	.04	0-.32	.61	.56-.71	.43	.05-.63	.01	.00-.26	.56	.48-.66	—	—	—	—	—	-1477.22
Full model (ADE)	.01	.00-.21	.34	.13-.41	.65	.59-.72	.41	.00-.51	.02	.00-.46	.57	.49-.66	—	—	—	—	—	-1486.43
Drop D (AE)	.31	.24-.37	—	—	.69	.63-.76	.41	.32-.49	—	—	.59	.51-.68	14.99	2	—	—	—	-1475.44 < .001
Drop D in females	.32	.25-.38	—	—	.68	.62-.75	.01	.00-.26	.43	.16-.51	.57	.49-.65	7.65	1	—	—	—	-1480.77 < .001
Drop D in males	.01	.00-.10	.35	.23-.41	.65	.59-.72	.43	.34-.51	—	—	.57	.50-.66	0.01	1	—	—	—	-1488.44 .9
Adult gender identity (M = F)																		
Full model (ACE)	.27	.01-.36	.02	.00-.24	.71	.64-.80	.27	.01-.36	.02	.00-.24	.71	.64-.80	—	—	—	—	—	-1677.221
Drop common environment (AE)	.28	.09-.35	.00	.00-.14	.72	.65-.80	.28	.09-.35	.00	.00-.14	.72	.65-.80	1.02	1	—	—	—	-1679.436 .31
Drop genetic (CE)	0	—	.28	.09-.35	.72	.65-.80	0	—	.28	.09-.35	.72	.65-.80	8.71	1	—	—	—	-1121.345 .003

CI = confidence interval; AIC = Akaike's information criterion. Preferred models are in bold. a² is additive genetic; c/d² is common environment or nonadditive genetic (depending on model to the left); e² is unique environment. For adult gender identity, male and female estimates could be equated (M = F) and were combined into a single estimate.

Genetic Model Fitting Results

For CGN, a model that accounted for nonadditive genetic influence (ADE) fit best (see table 7). Thus, all further nested models for CGN were compared to a full ADE model. In this model, the nonadditive genetic (D) estimate for females was markedly different from that for males. Fitting a model that removes D from males provided an equally good but more parsimonious fit compared to the full ADE model. These combined factors provide evidence of additive genetic influence and unique environment only for males (AE) but a combination of additive, nonadditive, and unique environmental influence for females (ADE). Importantly, there were no significant common environmental influences for either sex in the *full* ACE models of CGN.

The analyses imply that there may be a specific genetic influence driving a significant portion of the genetic variation in CGN in females but not in males. For males, the genetic variation appears to be the cumulative additive effect of all genes. In effect, CGN appears to be driven by different biological paths for males and females. At the very least, it could also be that the same genes are influencing males and females, but the effects of some of them may interact in females but not in males. With the current sample, we cannot definitely say which alternative presents the more likely explanation, and more elaborate samples are required to further explore this possibility.

In the case of the AGI, there was no need to consider a model with nonadditive genetic influences. Correlations

could be equated for males and females; the pooled MZ twin pair correlations were not greater than twice those of the pooled DZ twin pairs. Unlike for CGN, the preliminary analysis for AGI suggests additive genetic and environmental influences only (AE). Structural modeling affirmed those findings. The best fitting model for AGI is one where individual differences were attributable to a combination of additive genetic effects (.28) and unique environmental (.72) influences. Shared environmental (C) influences made no significant contribution in the full model (.02).

The potential for nonadditive genetic influence in females for CGN but only additive genetic influence in males and no such difference in AGI merits further discussion. Sex-specific genetic effects exist for many traits and dispositions related to social behaviors, aggressive behaviors, and personality. Genes on the X chromosome have been implicated in studies where nonadditive genetic influences are found in one sex but not the other (Dempster et al. 2007). This is of particular interest in understanding behavioral differences between the sexes because males have a single X and a single Y chromosome while females have two X chromosomes. X-linked genes have been associated with sex differences in neural development and social and aggressive behaviors, among other characteristics (Craig, Harper, and Loat 2004; Rutter, Caspi, and Moffitt 2003). The CGN scale is in part based on items related to aggression such as fighting, sports, fear, and heroism, among others. It is plausible that the nonadditive genetic influence on females and not males

may be akin to findings on aggression, brain structure, and X-linked genes. AGI does not include such items and offers a possible reason for the difference in findings between these scales. While certain genes are differentially expressed in males and females irrespective of their X-activation status (Xu, Burgoyne, and Arnold 2007), future studies exploring X-linked genes as a possible source of differences in gender nonconformity are necessary.

In summary, using the two gender scales, we found that individual differences in gender were not better explained by social construction or culturally learned behavior. Nor were they simply a matter of an individual's biological sex. Rather, the data support that it is highly unlikely that gender is "socialized" from the familial environment alone but instead that unique environmental factors exert the overwhelmingly strongest role in its development. In twin models, unique environment includes personal experiences as well as hormones introduced in the womb that differ between siblings. Thus, our findings are consistent with the neurobiological studies on gender identity mentioned above. However, while we find no evidence that individual differences in gender identity are socially constructed, it does not mean that social context is unimportant, for clearly global environmental factors exert an influence on its development. Indeed, only in certain environments is it possible to even measure gender identity, and findings such as these can only help identify the particular contexts and environments that do influence gender and allow for the expression of one's gender in unique ways (for a full discussion on the limitations and considerations of the model, see Web Appendix G).

Discussion

In a recent collection of essays considering the utility of gender as a mode of analysis, Browne (2007, 2) suggested that the cultural analyses of gendered behavior across the social sciences have recently "been challenged by what we might term a reinvigoration of 'the biology of gender . . . [and] new theories from the natural sciences are emerging to confront the traditional view of how 'gender' and 'sex' relate", demanding instead that we revisit the possibility that 'gendered behavior' is biologically derived." In a 2006 Women and Politics section newsletter, Jane Mansbridge stated, "We now have at our disposal, for better or worse, new tools in neurosurgery, neurobiology, and sociobiology" (Mansbridge 2007, 3).

Sex and gender identity are not indistinguishable, nor do they necessarily tap into the same underlying latent construct. Rather, different "genders" can exist within each sex and exert an influence independent of the biological demographic. Using two measures, one related to

CGN and a second related to AGI, we examined the effect of gender on adult voter preference. In so doing, we discovered significant differences in the predictive power of sex and gender, such that AGI better predicted voter support while CGN better predicted support for nonconformist parties. Not surprisingly, the relationship between gender and voter preference is not overly large, and we make no claim that gender identity is the most important determinant of vote choice. However, our argument does not focus on the overwhelming importance of gender in voter preference but rather on its critical difference from sex in predicting political behavior.

The individual construction of gender identity remains a remarkable process. Using a genetically informative sample, we identified an inherent dispositional component to the development of gender identity in both males and females, showing that genetic and unique factors accounted for individual differences in gender identity; recall that unique factors include individual differences in hormonal development and expression.

The finding that gender nonconformity may arise differently for males versus females is profound and requires reconciliation with the common underlying theory in the current political behavior literature regarding the interchangeability of sex and gender and how we think about the political impact of gender going forward. In light of these findings, it would be difficult to consider gender identity as "socially constructed" or developing in a similar fashion for males and females. While the expressed constructs of masculinity and femininity lay on opposite ends of the spectrum as defined socially, they may very well represent two entirely different constructs genetically and hormonally, as Bem (1981) implied and recent explorations in endocrinology suggest. Regardless, distinct sex and gender types may have evolved, developed, and sustained by and for different biological and social processes. To determine the degree to which it is possible to vary on masculine and feminine traits at the same time, how this process might occur through biological or socio-physiological interaction, and how development differs between the sexes, further research is needed.

Based on the findings presented, we argue for a more careful consideration of gender identity and a fundamental need to identify when gender or sexual dimorphism is the measure best suited to predict any given political preference. While there has been a dearth in the political behavior literature on the subject, the findings here may help provide the platform on which to build a more comprehensive theoretical structure. For certain foundational preferences, such as attitudes toward out-groups or potential policy issues that may have a component tied to reproduction (e.g., family leave), child care (e.g., child support), or economic fitness (e.g., equality in hiring), it

may be that sex is the more appropriate measure. But for more transient socially defined issues of the day (e.g., government bailout of the banking system) or more gender-specific policies such as financial support for the arts, gay pride parades, or vote choice, a more specific measure of one's actual gender identity may prove a better predictor. The topics in which sex or gender may prove a superior predictor is now open to empirical exploration.

Our measures introduce only a few of many potential aspects that define gender identity, but this does not limit their relevance or import. Rather, this suggests only that the effects we find here would only magnify in the context of gender measures more closely linked to political relations infused with hierarchies of power and domination in the economic, sexual, and social realms. While the effects of gender identity on political outcome may appear modest, the recognition of its distinction from sex can prove profoundly significant in characterizing the nature of these variables and elucidating their influence in future research.

While accepting that the results require converging evidence, discovering that gender has an independent influence on voter preference above and beyond sex, that individual differences in gender are primarily the result of the combination of innate influences and unique experience, and that this process may emerge differently in men than in women gives rise to a more comprehensive model that combines a person's worldview and biology with an understanding of political conditions and interests.

We believe that the contribution of our findings lies in the recognition of the importance of gender being independent of sex. In short, to the extent our findings prove generalizable to other venues, the dichotomous representation of sex cannot be used as a simple and straightforward proxy for gender. In Australia in the 1990s, gender predicted political preference and sex did not, illustrating the distinction between sex and gender identity. And for political purposes, scholars should require no better argument for the distinction between sex and gender identity and for the argument that sex cannot serve as an effective proxy for the effect of gender identity on political choice. As a result, we encourage the use of more sophisticated measures of gender identity in political surveys in the future.

The results constitute a complete reversal in the current dominant understanding of the relationship among sex, gender, and political preferences. The approach we present here changes the way we conceptualize gender identity and sex in the study of political attitudes and behaviors, running counter to the established traditional idea that confounds the two notions. If true, the extant empirically linear models that underlie established analysis regarding the impact of gender identity on politics are in need of revision. Equally important, the

construction of gender identity as a social process remains unsupported by the empirical analysis, a finding that has profound implications for the protection of individual rights and freedoms.

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Note

1. For example, David was interested in women and would urinate standing up when no one was looking; these and other important aspects of his behaviors were left out of Money's articles.

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