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Heterosexuals' Attitudes Toward Transgender People: Findings from a National Probability Sample of U.S. Adults

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Abstract Using data from a national probability sample of heterosexual U.S. adults ($N=2,281$), the present study describes the distribution and correlates of men's and women's attitudes toward transgender people. Feeling thermometer ratings of transgender people were strongly correlated with attitudes toward gay men, lesbians, and bisexuals, but were significantly less favorable. Attitudes toward transgender people were more negative among heterosexual men than women. Negative attitudes were associated with endorsement of a binary conception of gender; higher levels of psychological authoritarianism, political conservatism, and anti-egalitarianism, and (for women) religiosity; and lack of personal contact with sexual minorities. In regression analysis, sexual prejudice accounted for much of the variance in transgender attitudes, but respondent gender, educational level, authoritarianism, anti-egalitarianism, and (for women) religiosity remained significant predictors with sexual prejudice statistically controlled. Implications and directions for future research on attitudes toward transgender people are discussed.

Keywords Transgender · Attitudes · Sexual prejudice · Public opinion

Introduction

This article examines the attitudes of heterosexual men and women toward transgender people in the United States. Because transgender identities challenge prevailing binary assumptions about gender and sex—assumptions that are closely related to beliefs about sexual orientation—heterosexuals' attitudes toward gender minorities were expected to be strongly associated with their attitudes toward sexual minorities and to have many of the same correlates. These and related hypotheses were tested with feeling thermometer data obtained from a national probability sample of heterosexual men and women, making this the first report on U.S. attitudes toward transgender people in a nationally representative sample.

Previous Research on Attitudes Toward Transgender People

Since the mid-1990s, the term *transgender* has come to refer broadly to individuals who express so-called gender-variant qualities and expressions (Stryker 2006; Valentine 2007). Stryker's (1994) frequently cited definition captures the diversity of individuals included under the label: “[transgender is] an umbrella term that refers to all identities or practices that cross over, cut across, move between, or otherwise queer socially constructed sex/gender boundaries” (p. 251). Although consensus is lacking and the definition is evolving, *transgender* is often taken to include *transsexuals* (individuals who express a desire to change from one anatomical sex to the other; Meyerowitz 2002; Valentine 2007), *cross-dressers* (people who generally identify as the gender assigned to them

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at birth, but who sometimes dress in clothing of the “other” gender without necessarily wishing to alter their bodily sex; Lev 2004; Meyerowitz 2002), and people who feel that their gender expressions and practices are not fully captured by either of the traditionally recognized categories of “man” or “woman” (Roen 2002; see also Stone 1991).

The available evidence from U.S. adult samples suggests that transgender people face widespread prejudice and discrimination (e.g., Bryant and Schilt 2008; Grant et al. 2011; Lombardi 2009) and may be at heightened risk for violence because of their gender identities and expression (e.g., Grant et al. 2011; Jenness et al. 2007). However, systematic research addressing public attitudes toward transgender people has been limited.

Early empirical studies in this area generally focused on attitudes toward transsexuals. For example, Green et al.’s (1966) survey of more than 300 U.S. medical and psychiatric professionals documented widespread endorsement of the view that transsexuals were “severely neurotic.” Later research, by contrast, found considerably more positive attitudes among U.S. mental health care providers (Franzini and Casinelli 1986). Leitenberg and Slavin (1983) found that a greater percentage of U.S. university students considered homosexuality to be “always wrong” compared to transsexuality. Women were significantly less likely than men to say that transsexuality is “always wrong” (17.8% vs. 26.2%). A 1998 national mail survey of Swedish adults documented majority support for the rights of transsexual people to pursue treatment, change their legal standing to reflect their new gender, and marry, but found considerably less support for adoption rights (Landén and Innala 2000). Women were more likely than men to support transsexuals’ surgical or hormonal treatment options as well as allow them to work with children as teachers; women were also more comfortable with the idea of having an openly transsexual coworker or friend.

More recent research reflects the emergence of *transgender* as a term encompassing a variety of individuals who violate traditional gender norms. Studies conducted in several countries have identified demographic correlates and potential psychological sources of negative attitudes directed at the members of this larger group (with some studies including transsexuals as a specific subgroup of transgender). Consistent with earlier findings from Sweden and the United States examining attitudes toward *transsexuals* (Landén and Innala 2000; Leitenberg and Slavin 1983), these studies have found more negative attitudes toward *transgender people* among men than women in samples from Canada (Hill and Willoughby 2005), the United Kingdom (Tee and Hegarty 2006), Hong Kong (King et al. 2009; Winter et al. 2008), and the United States (Nagoshi et al. 2008). In addition, more negative attitudes toward transgender and transsexual people were associated with lower levels of education in Hong Kong (King et al. 2009), older age cohorts in Hong Kong and

Sweden (King et al. 2009; Landén and Innala 2000), greater religiosity in the United Kingdom (Tee and Hegarty 2006) and religious fundamentalism in the United States (Nagoshi et al. 2008), authoritarianism in the United Kingdom and the United States (Nagoshi et al. 2008; Tee and Hegarty 2006), and less support for general egalitarian ideals in Hong Kong (King et al. 2009). These demographic and psychosocial variables are also consistent correlates of heterosexuals’ attitudes toward gay men and lesbians (Herek 2009a) and thus, it is not surprising that several studies have found that attitudes toward sexual and gender minorities are highly correlated (e.g., Hill and Willoughby 2005; Nagoshi et al. 2008; Tee and Hegarty 2006).

Also consistent with past research on sexual prejudice directed at gay men and lesbians (Pettigrew and Tropp 2006), lack of prior contact with gender-variant people was associated with more negative attitudes toward them in a Hong Kong sample (King et al. 2009). Tee and Hegarty (2006) found that having prior contact with gay men and lesbians was an even more powerful predictor of support for the legal rights of transsexuals than was prior contact with gender minorities. The pattern observed by Tee and Hegarty (2006) resembles a phenomenon identified in research on racial and ethnic attitudes, labeled the *secondary transfer effect* of intergroup contact, whereby the prejudice-reducing effects of contact with one outgroup transfer to attitudes toward another similarly stigmatized group (Pettigrew 2009; Tausch et al. 2010). Tee and Hegarty’s (2006) data suggest that a secondary transfer effect may operate with attitudes toward sexual and gender minorities, at least among students in the United Kingdom.

Although these studies provide important data, they are few in number. Most of them—including all of the U.S. studies—were conducted with nonprobability samples. With only two exceptions—King et al. (2009; Hong Kong) and Landén and Innala (2000; Sweden)—all of the studies published in the past 25 years relied largely or exclusively on college student samples. The extent to which their findings can be generalized to the U.S. adult population cannot be known. Thus, knowledge about attitudes toward transgender people is still very limited, particularly in the United States, and data from probability samples are needed to provide a better understanding of current attitudes and their social psychological correlates.

The present article addresses this need by reporting data on transgender attitudes obtained in a U.S. national probability sample of heterosexual adults. The data were collected in the course of a larger study that examined heterosexuals’ attitudes toward sexual minority individuals and laws and public policies that affect them. Although its primary intent was not to assess attitudes toward transgender people, it included a measure of those attitudes, which constitutes the key outcome variable in the analyses reported below. Using this measure, the present study aims to provide insights into the social psychology of attitudes toward

transgender people while fulfilling a practical need for information about those attitudes in the U.S. population.

Theoretical Rationale

As detailed below, our theoretical framework is based on two main points. First, transgender identities pose a challenge to the widespread assumptions that gender and biological sex are binary categories and that individual expressions of gender necessarily correspond to either a male or female bodily form. Second, because these assumptions are also linked to beliefs about sexual orientation, attitudes toward gender minorities are likely to have strong psychological ties to attitudes toward sexual minorities.

Gender and Sex as Binary Categories

More than 40 years ago, Garfinkel (1967) used the phrase “natural attitude” toward gender to refer to the widespread and taken-for-granted belief that people can be classified into one of only two “natural” and invariant gender categories, each of which is determined by the presence of particular genitals and for which exceptions are temporary or pathological. Although Garfinkel’s goal was not to systematically study why some people react more negatively to violations of the natural attitude than others, his analysis of the experience of “Agnes,” a male-to-female transsexual, documented examples of both negativity and acceptance in reaction to Agnes’ secret and highlighted the value of research into the basis of this variability.

Since Garfinkel’s research, psychological studies in the United States have confirmed that most people conceptualize gender in terms of dichotomous, mutually-exclusive categories and hold different standards for what constitutes an appropriate expression of gender for men and for women (e.g., Bem 1974). Research from both college and nonstudent samples suggests that many people respond negatively to deviations from normative gender role expectations (e.g., Eagly et al. 1992; Rudman and Fairchild 2004). Although the magnitude of the differences between standards for men and women may have decreased in recent decades, these gender norms nevertheless persist (Auster and Ohm 2000).

Gender standards are particularly strict for men. Research from U.S. and Canadian undergraduate samples, for example, suggests that men appear to be generally less accepting than women of children’s cross-gender behavior (Martin 1990), and violations of gender norms by men and boys tend to evoke more negative reactions than violations by women and girls (McCreary 1994; Sirin et al. 2004). Psychologists have frequently invoked this differential enforcement of gender norms as a partial explanation for the relatively consistent finding that men and boys avoid expressions of femininity

more vigorously than women and girls avoid expressions of masculinity (McCreary 1994).

Gender, Inversion, and Sexual Orientation

Why deviations from gender norms evoke negative attitudes, especially for men, might be at least partly explained by considering the relationship between gender and sexual orientation. As social historians have documented, contemporary Western concepts of sexual orientation, heterosexuality, and homosexuality have developed largely since the 19th century (Katz 1995; Weeks 1977). Historically, the category of *the homosexual* was preceded by that of *the sexual invert*. “Male inverts” were believed to possess an array of “feminine” qualities (e.g., passivity and weakness) and “female inverts” were believed to manifest “masculine” qualities (e.g., assertiveness and an interest in sexuality). Sexual inversion originally described the totality of the individual; sexual attraction to people of the same sex was understood as only one aspect of it (Chauncey 1982–1983). Around the turn of the twentieth century, however, this began to change. Notably, Freud’s theory of “sexual object choice” conceptually decoupled same-sex attraction from a general nonconformity to culturally prescribed gender roles (Chauncey 1982–1983; Freud 1953).

Many scientific studies of sexual orientation throughout the twentieth century, however, relied on assumptions about homosexuality that were consistent with the sexual inversion model (Fausto-Sterling 2000; Jordan-Young 2010). In addition, contemporary stereotypes continue to link homosexuality with the violation of gender norms (Herek 2000; Kite and Deaux 1987; Madon 1997) and this association appears to be stronger for men than for women (Kite and Deaux 1987; Martin 1990; Whitley 2002), according to studies conducted primarily with U.S. and Canadian college samples. Research from national U.S. samples suggests that heterosexual men generally express more negative attitudes toward homosexuality than do heterosexual women, and this difference is especially pronounced for their attitudes toward gay men (Herek 2002a; Kite and Whitley 1998). This pattern suggests the possibility that compared to women, men may be particularly invested in maintaining an identity that is both masculine and heterosexual, a task that is complicated by the relative difficulty associated with living up to male gender norms (Herek 1986; Kimmel 1997). Indeed, several researchers have suggested that men’s sexual orientation and gender identity are intertwined and are closely linked with their attitudes toward homosexuality. For example, Herek (1986) argued that heterosexuality is widely understood to be an integral part of masculinity in the United States. Kimmel (1997) suggested that men’s avoidance of femininity is tightly bound in Western culture to what it means to be heterosexual, and that their hostility

toward gay men is motivated by a desire to be perceived as heterosexual and masculine, i.e., *not* homosexual.

Thus, heterosexuals' attitudes toward homosexuality—especially heterosexual men's attitudes toward gay men—are strongly associated with their conceptions of gender as well as sexuality. The stability of both gender and sexual orientation categories, however, is called into question by transgender identities. Transgender people violate what Garfinkel (1967) called the “natural attitude” toward gender by changing from one gender to another or by not conforming to societal expectations for male- or female-bodied people. Furthermore, they challenge the concept of sexual orientation, which relies on a binary view of gender for its coherence (Moradi et al. 2009). Thus, although most contemporary conceptions of transgender identity distinguish gender identity from sexual orientation (but see Valentine 2007, for discussion), attitudes toward transgender people are likely to be closely related to attitudes toward sexual minorities, especially gay men, and this linkage may be stronger among heterosexual men than heterosexual women. Indeed, in a study conducted with a U.S. student sample, statistically controlling for sexual prejudice reduced the correlations between men's transgender attitudes and their levels of authoritarianism and religious conservatism to non-significance; for women, by contrast, the correlations remained significant when sexual prejudice was controlled (Nagoshi et al. 2008). Thus, men's attitudes toward gender and sexual minorities appeared to share the same psychological sources, whereas women's attitudes did not.

Hypotheses

Consistent with this conceptual framework and findings from previous research, the present study tests five major hypotheses. First, heterosexuals' attitudes toward transgender people are positively correlated with their attitudes toward sexual minorities. Second, they are more negative among men than women. Third, to the extent heterosexual respondents endorse a binary conception of gender, their attitudes toward transgender people are more negative.

Fourth, transgender attitudes are correlated with the same social and psychological variables that have consistently been observed to correlate with heterosexuals' attitudes toward sexual minorities. From the large pool of such variables (e.g., Herek 2009b) we focused on four that have been found to be important in previous research: psychological authoritarianism (Nagoshi et al. 2008; Tee and Hegarty 2006), political conservatism (including anti-egalitarian attitudes) (King et al. 2009), religiosity (Nagoshi et al. 2008; Tee and Hegarty 2006), and personal contact with sexual minorities (Tee and Hegarty 2006).

Conceptions of *authoritarianism* commonly include rigid adherence to rules and intolerance for ambiguity as important components, and psychological research has found that

individuals who express high levels of authoritarianism display a general tendency to reject outgroup members, especially those who are perceived to violate social conventions and traditional values (Altemeyer 1996; Stenner 2009). Similarly, the core psychological components of *political conservatism* include avoidance of uncertainty and an intolerance of ambiguity as well as resistance to change and justification of inequality (Jost et al. 2003). Individuals high in conservatism would therefore be expected to react negatively to a group of people largely defined by embodying fluidity and change in a characteristic that is generally viewed in U.S. society as given and immutable. *Religiosity* is likely to be associated with transgender attitudes because, although the stance of many religious denominations toward sexuality and gender is shifting, condemnation of same-sex behavior and support for traditional gender roles remains widespread (Pew Forum on Religion and Public Life 2010). Finally, intergroup contact theory (Pettigrew and Tropp 2006) posits that attitudes toward an outgroup tend to be more favorable among ingroup members who have *personal contact experiences* with one or more of its members. Although the survey from which the present data were obtained did not include a question about respondents' previous personal contact with transgender individuals, we hypothesized that respondents' attitudes toward transgender people would be more positive to the extent that they reported having personal contact with lesbians and gay men. We based this hypothesis on the assumption that the population of heterosexuals having personal contact with sexual minorities overlaps to at least some extent with the population of those having contact with gender minorities, as well as previous evidence for a secondary transfer effect of intergroup contact in this domain (Tee and Hegarty 2006). Thus, we hypothesized that heterosexuals would express more negative attitudes toward transgender people to the extent that they displayed higher levels of authoritarianism, political conservatism (including anti-egalitarian attitudes), and religiosity, and less personal contact with sexual minorities.

Fifth, because our conceptual framework posits that heterosexual men's conceptions of gender are more strongly associated with their attitudes toward homosexuality than is the case for heterosexual women, we expected men and women to differ in the extent to which their attitudes toward gender minorities and sexual minorities share common psychological roots. We hypothesized that men's attitudes toward both groups are linked in similar ways to the variables specified in Hypotheses 3 and 4 (gender attitudes, authoritarianism, political ideology and anti-egalitarianism, and religiosity). Consequently, if sexual prejudice is statistically controlled, the correlations between those variables and men's transgender attitudes should be reduced to nonsignificance, consistent with previous findings (Nagoshi et al. 2008; Tee and Hegarty 2006). For women, by contrast,

gender and sexual attitudes are less closely linked. Thus, we expected the relationships between their attitudes toward transgender people and the variables in Hypotheses 3 and 4 to be more independent from their attitudes toward sexual minorities than is the case for men. Consequently, those correlations should remain significant when sexual prejudice is statistically controlled. Because previous studies have revealed consistently strong associations between sexual prejudice and heterosexuals' personal contact with lesbians and gay men (e.g., Pettigrew and Tropp 2006)—such that contact might be considered a proxy for attitudes toward sexual minorities—we excluded the contact variable from tests of this hypothesis.

Method

Sample

As noted above, the data were collected as part of a larger survey examining U.S. heterosexuals' attitudes toward sexual minorities and policy issues related to sexual orientation. The larger study employed a probability sample of English-speaking, self-identified heterosexual adults (≥ 18 years of age) residing in, and citizens of, the United States. The sample was drawn from the Knowledge Networks (KN) panel, itself a large (approximately 40,000 households at the time of data collection) probability sample of English-speaking U.S. residents who were recruited through random-digit dialing (RDD) methods. Upon initially joining the KN panel, respondents agreed to participate regularly in on-line surveys, and were provided with free Internet access and equipment if they did not already have it. Thus, in contrast to Internet studies with volunteer samples recruited via the Web, the KN panel includes individuals who would not otherwise have Internet access because of their financial or social situation. Reflecting this fact, KN samples are demographically similar to the RDD samples used in traditional telephone surveys (Chang and Krosnick 2009) and have been used extensively in academic research (Couper et al. 2004; Herbenick et al. 2010; Lawless 2004; see generally Knowledge Networks 2011).

KN panel members routinely answer a battery of demographic and background questions, including an item about their sexual orientation. Using these data, a random sample was drawn of 4,106 English-speaking adults who had previously responded "no" to the question, "Are you yourself gay, lesbian, or bisexual?" These respondents were assumed to be heterosexual.

Of those invited, 3,244 joined the larger study, a cooperation rate of 79%. Taking into account all attrition in the KN panel since the earliest stage of RDD recruitment, the response rate was 31.8% (American Association for Public Opinion

Research 2006 [Formula 3]). This is a relatively high rate for contemporary commercial surveys (Holbrook et al. 2008). Of these individuals, 384 did not provide complete data or were not eligible (e.g., because of citizenship or age) and were excluded from the larger study.

The larger study investigated multiple aspects of respondents' attitudes and beliefs, and not all measures were administered to every participant. The transgender feeling thermometer (this paper's key measure) was administered to a randomly selected subset of 2,281 respondents. The analyses reported below are based on this subsample. Participants were not asked if they self-identify as transgender. Although no national data currently exist for the number of transgender people in the United States—much less the number who do not self-identify as lesbian, gay, or bisexual—we assumed that their representation in the current sample was likely to be very small.

Procedures

Data were collected between August 26 and September 26, 2005. Following standard KN procedures, potential participants received an e-mail that invited them to complete a questionnaire concerning "Opinions About People and Groups." The text of the e-mail stated, "We have some questions about how you think about other people and groups. Please let us know your experiences and opinions on this topic at your earliest convenience. We appreciate your participation." Respondents completed the on-line survey at a time of their own choosing. One follow-up e-mail reminder was sent to nonrespondents. The median time spent completing the entire questionnaire was approximately 21 minutes.

Measures

The questionnaire included a large number of measures on a variety of topics. Only those relevant to the present study are discussed here.

Attitudes toward Transgender People and Other Groups

Attitudes toward transgender people and other groups were measured with a series of 101-point feeling thermometers. Feeling thermometers have been widely used by political scientists and psychologists to assess attitudes toward a variety of individuals and groups, including sexual minorities (American National Election Studies 2011; Haddock et al. 1993; Herek 2002b; Herek and Capitano 1999). Although they have the psychometric limitations associated with single-item measures, they have the advantage of permitting comparisons of attitudes toward disparate targets using a single metric. In addition, they are cost-effective

for large-scale surveys in which lengthy psychological scales are impractical due to budget constraints.

The instructions for the feeling thermometers were: “Using a scale from zero to 100, please tell us your personal feelings toward each of the following groups. As you do this task, think of an imaginary thermometer. The warmer or more favorable you feel toward the group, the higher the number you should give it. The colder or less favorable you feel, the lower the number. If you feel neither warm nor cold toward the group, rate it 50.” To familiarize respondents with the response format, they were first presented with thermometers for “Men in general” and “Women in general,” with each respondent rating her or his own gender group first. Next, they rated sexual orientation groups (gay men, lesbians, bisexual men, bisexual women); the order of presentation was randomized. The ratings of transgender people came last. Higher ratings (maximum=100) indicate warmer, more favorable feelings toward the target whereas lower ratings (minimum=0) indicate colder, more negative feelings. The thermometers for the sexual orientation groups (but not for transgender people) included experimental manipulations of item wording, which did not affect the outcomes reported in the present paper.

Demographic and Background Variables

Information about participants’ gender, racial and ethnic background, age, educational level, state of residence, and political ideology (self-ratings on a 7-point scale ranging from *strongly liberal* to *strongly conservative*) were obtained from their prior answers to a battery of KN demographic and background questions. In addition, the present study’s questionnaire asked respondents to characterize their current residence location as a large city, small city, suburban area, small town, or rural area.

Attitudes Toward Lesbians and Gay Men

Respondents completed a short version of the Attitudes Toward Lesbians and Gay Men (ATLG) scale, comprising 3-item versions of the Attitudes Toward Lesbians (ATL) and Attitudes Toward Gay Men (ATG) subscales (Herek 1994). Unlike the feeling thermometers, which measure a general emotional reaction to the target groups, the ATLG measure is intended to specifically address condemnation of homosexuality (Herek 2009a). The ATL items are: (1) “Sex between two women is just plain wrong.” (2) “I think female homosexuals (lesbians) are disgusting.” (3) “Female homosexuality is a natural expression of sexuality in women.” The ATG items use parallel wording with the terms “men” and “male” substituted as appropriate. Each statement was presented with a 5-point Likert response scale ranging from *Strongly agree* to *Strongly disagree*. After reversing the scoring for the “natural” item, scale scores were computed

by summing responses and dividing by the number of items. Thus, they could range from 1 to 5, with higher scores indicating higher levels of sexual prejudice. Internal reliability was acceptably high for both the ATG and the ATL ($\alpha = .69$ and $.70$, respectively).

Social and Psychological Correlates

As noted above, budget constraints did not permit the inclusion of lengthy psychological scales in the survey. Consequently, single-item measures were used to assess several of the independent variables. Unless otherwise noted, each statement was presented with a 5-point Likert response scale ranging from *Strongly agree* (coded as 5) to *Strongly disagree* (coded as 1). Higher scores on these items indicate greater agreement.

The extent to which respondents endorsed a binary conception of gender was assessed by their level of agreement or disagreement with an item created for the present questionnaire, “These days there is not enough respect for the natural divisions between the sexes.” Greater agreement indicates stronger belief in a gender binary.

Higher levels of psychological authoritarianism were indicated by agreement with the statement “Obedience and respect for authority are the most important virtues children should learn.” This item has been used in multiple measures of authoritarianism, including the original F-scale and Altemeyer’s Right Wing Authoritarianism scale (Altemeyer 1996).

In addition to respondents’ self-labeling on the 7-point liberal-conservative scale (described above), political ideology was operationalized in terms of anti-egalitarian attitudes, using an item from the American National Elections Study (ANES), “We have gone too far in pushing equal rights in this country” (Brewer 2003). Greater agreement indicates more anti-egalitarian attitudes. Based on another ANES question, religiosity was assessed by asking respondents how much guidance religion provides in their day-to-day living (“None at all,” “Some,” “Quite a bit,” “A great deal”).

Respondents were asked whether they had ever had any friends, relatives, or close acquaintances who were gay or lesbian. Those reporting at least one gay or lesbian friend, family member, or close acquaintance were operationally defined as having had prior contact. Participants who responded “no” to this question were coded as having “no contact.”

Data Analysis and Weighting

Standard techniques were used to compute design weights and post-stratification weights for the sample (e.g., Massey and Botman 1988), and these weights were used in the analyses reported below unless otherwise stated. The purpose of weighting is to increase the precision of the survey estimates of population parameters and to reduce potential

bias due to noncoverage, undercoverage, and nonresponse. Design weights are used to adjust the data for aspects of the sampling design and implementation that depart from a simple random sample. For example, individuals living in households with multiple telephone lines have a greater likelihood of being contacted (and thus potentially included in the sample) than individuals who have only one telephone line. A design weight is computed for each respondent to adjust for such differences.

Poststratification weights are used to adjust for differences between the demographic composition of the sample and of the population from which it was drawn. In the present study, poststratification weights for gender, age, race and ethnicity, educational level, geographic region, and residence in a metropolitan area were computed for each respondent using the most recent Current Population Survey (CPS) conducted by the U.S. Census Bureau for the population of adults 18 and older. They were supplemented by data from the Knowledge Networks panel when the latter were more current than CPS data. The weighting procedures also adjusted for the fact that some populations (African Americans, Hispanics, and California residents) were intentionally oversampled in the parent study; responses from these groups were weighted according to their representation in the U.S. adult population.

Because of the sampling design and the use of weighted data, statistical procedures that are routinely employed with nonprobability samples were not appropriate for the current data set (Lee and Forthofer 2006). Accordingly, analyses were conducted using STATA and SPSS Complex Samples, which compute standard errors that are adjusted for such designs. Cases were included in each analysis only when they had complete data for all of the relevant variables.

Results

Sample Composition

The sample composition was first examined using the unweighted data to assess whether men and women differed on key demographic variables. Significant gender differences were found within the distributions of race and ethnicity, $\chi^2(3, N=2281)=11.13, p=.01$, education, $\chi^2(3, N=2281)=12.67, p<.01$, and current residence, $\chi^2(4, N=2273)=10.22, p<.05$. Examination of the adjusted residuals revealed that these differences reflected somewhat greater numbers of Black women than men and somewhat more White men than women, higher levels of education among women, and somewhat more men than women residing in rural areas. We controlled for these variables in subsequent analyses as appropriate. No significant gender differences were observed for age or geographic region.

Using the weighted data, Table 1 describes the sample composition for key demographic groupings and reports mean transgender feeling thermometer scores for each group. Transgender thermometer scores differed significantly by education, *Wald F*(3, 2278)=12.66, and current residence, *Wald F*(3, 2269)=5.19 (all *ps*<.001), but not by race and ethnicity. (In light of the differences in the distribution of men and women respondents for these variables, we controlled statistically for gender in these analyses.) Follow-up *t*-tests indicated that ratings of transgender people were significantly lower (i.e., more negative, all *ps*≤.001) among respondents who had not graduated from college (compared to college graduates) and residents of rural areas (compared to residents of cities or suburbs). Thermometer scores also differed significantly by geographic region, *Wald F*(4, 2277)=6.07, *p*<.001; ratings of transgender people were significantly lower among residents of the South or Mountain states, compared to Pacific Coast residents. Thermometer scores did not differ significantly by age.

Hypothesis 1: Correlations of Attitudes Toward Transgender People With Attitudes Toward Sexual Minorities

Before examining the correlations across attitude measures, we report mean scores for the feeling thermometers and the Attitudes Toward Gay Men (ATG) and Attitudes Toward Lesbian (ATL) scales, as well as their associated standard errors and 95% confidence intervals (CIs) in Table 2. The mean thermometer rating for transgender people was 32.01 (CI=30.23–33.79). As Table 2 shows, this score was lower than all of the other feeling thermometers. The nonoverlapping CIs between the transgender mean thermometer score and those for men and women in general, gay men and lesbians, and bisexual women indicate that these differences were statistically significant. Because the multiple comparisons increase the likelihood of Type I error, we also examined the 99.5% CIs (equivalent to the application of a Bonferroni correction) and observed the same pattern of non-overlap (not shown in Table 2). Although the 95% CIs for transgender people and bisexual men overlap slightly, a follow-up *t*-test indicated that they were significantly different, *t*(2279)=6.35, *p*<.001.

Consistent with Hypothesis #1, thermometer scores for transgender people and the four sexual minority groups were highly correlated. For the transgender thermometer, *r*(2276)=.80 with the gay men thermometer, *r*(2277)=.67 with the lesbian thermometer, *r*(2280)=.84 with the bisexual men thermometer, and *r*(2280)=.66 with the bisexual women thermometer (all *ps*<.001). Ratings of transgender people were negatively correlated with scores on the ATG and ATL (higher ATG and ATL scores indicate greater sexual prejudice). For sexual prejudice directed

Table 1 Mean feeling thermometer scores for transgender people by gender and demographic group

Variable (% of N)	Women (<i>n</i> =1,277)	Men (<i>n</i> =1,004)	Total sample (<i>N</i> =2,281)
Entire sample (100%)	36.22 _a (1.18)	27.63 _b (1.35)	32.01 (0.91)
<i>CI</i>	33.90–38.54	24.98–30.28	30.23–33.79
Race			
White (68.6%)	36.69 _a (1.55)	25.89 _b (1.76)	31.11 (1.20)
<i>CI</i>	33.65–39.74	22.44–29.34	28.77–33.46
Black (11.2%)	34.18 (1.50)	34.98 (2.33)	34.52 (1.31)
<i>CI</i>	31.25–37.11	30.41–39.56	31.95–37.09
Hispanic (12.8%)	36.67 _a (1.96)	30.40 _b (2.18)	33.73 (1.47)
<i>CI</i>	32.82–40.51	26.13–34.67	30.85–36.61
Mixed/Other (7.4%)	35.02 (5.85)	31.18 (4.56)	33.54 (4.00)
<i>CI</i>	23.54–46.49	22.24–40.11	25.69–41.38
Age (Overall <i>M</i> =45.87)			
18–29 (21.6%)	40.60 _a (2.83)	27.30 _b (2.95)	33.43 (2.10)
<i>CI</i>	35.05–46.15	21.52–33.08	29.31–37.55
30–44 (29.6%)	36.09 _a (2.02)	25.54 _b (2.34)	30.82 (1.62)
<i>CI</i>	32.13–40.05	20.95–30.12	27.64–33.99
45–59 (27.1%)	35.84 (2.26)	30.57 (2.10)	33.29 (1.53)
<i>CI</i>	31.41–40.27	26.45–34.69	30.28–36.29
60 and over (21.7%)	33.25 (2.45)	27.24 (3.64)	30.63 (2.12)
<i>CI</i>	28.45–38.05	20.10–34.98	26.48–34.77
Education			
Less than high school (15.8%)	26.98 (3.59)	21.10 (3.04)	24.58 _x (2.48)
<i>CI</i>	19.94–34.02	15.15–27.05	19.73–29.44
High school (32.4%)	34.09 _a (2.06)	24.98 _b (2.56)	28.85 _x (1.76)
<i>CI</i>	30.05–38.14	19.96–30.01	25.40–32.29
Some college (27.0%)	36.95 _a (1.95)	28.34 _b (2.32)	33.08 _x (1.52)
<i>CI</i>	33.14–40.77	23.80–32.89	30.10–36.07
Bachelor's or more (24.8%)	44.26 _a (1.92)	34.66 _b (2.22)	39.70 _y (1.45)
<i>CI</i>	40.50–48.02	30.30–39.02	36.85–42.55
Geographic Region			
Northeast (18.1%)	39.81 _a (2.51)	28.98 _b (3.47)	34.56 (2.19)
<i>CI</i>	34.90–44.73	22.18–35.78	30.27–38.85
South (35.9%)	31.23 _a (1.90)	25.18 _b (2.37)	28.08 _x (1.54)
<i>CI</i>	27.50–34.95	20.54–29.83	25.07–31.10
Midwest (23.0%)	37.80 (2.34)	30.78 (2.91)	34.28 (1.89)
<i>CI</i>	33.21–42.38	25.07–36.48	30.58–37.98
Mountain (7.1%)	26.90 (4.18)	22.63 (3.59)	25.25 _x (2.88)
<i>CI</i>	18.70–35.11	15.60–29.67	19.61–30.89
Pacific (15.9%)	44.97 _a (2.62)	29.19 _b (2.09)	37.70 _y (1.87)
<i>CI</i>	39.84–50.09	25.09–33.28	34.04–41.36
Current Residence			
Large city (28.2%)	37.62 _a (1.74)	30.19 _b (2.53)	34.04 _x (1.53)
<i>CI</i>	34.20–41.03	25.22–35.15	31.03–37.04
Small city (22.0%)	35.83 (2.97)	32.73 (3.06)	34.47 _x (2.13)
<i>CI</i>	30.01–41.64	26.72–38.74	30.30–38.64
Suburb (18.6%)	40.35 _a (2.13)	29.39 _b (3.04)	35.27 _x (1.88)
<i>CI</i>	36.19–44.52	23.44–35.34	31.58–39.97
Small town (21.0%)	35.02 _a (2.77)	23.25 _b (2.73)	28.88 (2.00)
<i>CI</i>	29.60–40.45	17.90–28.61	24.95–32.81
Farm, wilderness, rural area (10.2%)	25.40 (4.05)	18.77 (3.46)	21.42 _y (2.68)
<i>CI</i>	17.46–33.33	11.98–25.56	16.16–26.68

Note. For current residence, *N*=2,273; for all other variables, *N*=2,281. Thermometer scores range from 0 to 100; higher scores indicate more positive attitudes. Within rows, differing subscripts (a, b) indicate significant mean differences between women and men; in the “Total” column, differing subscripts (x, y) indicate significant mean differences across demographic subgroups (*p*s<.05)

S.E. = standard error of the estimate, corrected for complex sample design

CI=95% Confidence interval

Table 2 Mean feeling thermometer and ATG/ATL scores by respondent gender

Measure (<i>N</i>)	Women	Men	Total sample
“Transgender people” thermometer (2,281)	36.22 _a (1.81)	27.63 _b (1.35)	32.01 (.91)
<i>CI</i>	33.90–38.54	24.98–30.28	30.23–33.79
“Men in general” thermometer (2,274)	65.71 _a (.88)	59.03 _b (1.00)	62.44 (.67)
<i>CI</i>	63.98–67.44	57.06–61.00	61.11–63.76
“Women in general” thermometer (2,275)	67.74 (.95)	67.38 (.97)	67.56 (.68)
<i>CI</i>	65.89–69.60	65.47–69.28	66.23–68.89
“Gay men” thermometer (2,276)	44.02 _a (1.25)	33.57 _b (1.33)	38.89 (.92)
<i>CI</i>	41.56–46.47	30.97–36.17	37.08–40.69
“Lesbian women” thermometer (2,277)	42.55 (1.19)	41.63 (1.51)	42.10 (.96)
<i>CI</i>	40.21–44.88	38.66–44.59	40.22–43.97
“Bisexual men” thermometer (2,280)	37.88 _a (1.15)	31.87 _b (1.34)	34.93 (.89)
<i>CI</i>	35.63–40.14	29.23–34.50	33.19–36.67
“Bisexual women” thermometer (2,280)	39.04 (1.16)	42.00 (1.53)	40.49 (.96)
<i>CI</i>	36.76–41.31	39.01–44.99	38.61–42.37
ATG (2,267)	3.51 _a (.05)	3.89 _b (.05)	3.70 (.04)
<i>CI</i>	3.41–3.60	3.79–3.99	3.63–3.76
ATL (2,258)	3.41 _a (.05)	3.23 _b (.06)	3.32 (.04)
<i>CI</i>	3.32–3.50	3.12–3.35	3.25–3.39

Note. Thermometer scores range from 0 to 100; higher scores indicate more positive feelings toward the group. ATG = Attitudes Toward Gay Men scale. ATL = Attitudes Toward Lesbians scale. ATG and ATL scores range from 1 to 5; higher values indicate greater sexual prejudice. Within rows, differing subscripts indicate significant ($p \leq .005$) mean differences between women and men, controlling for race/ethnicity, educational level, and type of residence locale. S.E. = standard error of the estimate, corrected for complex sample design. CI = 95% confidence interval.

at gay men, $r(2267) = -.52$, and for prejudice against lesbians, $r(2258) = -.39$, both $p < .001$.

Hypothesis 2: Gender Differences in Attitudes Toward Transgender People

As hypothesized and as noted above, men expressed significantly less favorable attitudes than women toward transgender people, controlling for race, education, and current residence, $t(2272) = 5.01$, $p < .001$ (see Table 2). We also conducted a series of t-tests to assess gender differences in the remaining thermometer scores and in ATG and ATL scores, again controlling for race, education, and residence. To reduce the likelihood of Type I error, a Bonferroni correction was employed and the critical p value was set at .005. Compared to heterosexual women, heterosexual men assigned significantly more negative ratings to all of the “men” targets: “men in general,” $t(2265) = 5.02$; “gay men,” $t(2267) = 5.97$; and “bisexual men,” $t(2271) = 3.53$. Men also scored higher than women (indicating greater sexual prejudice) on both the ATG scale, $t(2258) = 5.50$, and the ATL scale, $t(2249) = 2.80$, although the difference on the ATL scale was marginal ($p = .005$). Men’s and women’s thermometer ratings of “women in general,” “lesbians,” and “bisexual women” did not differ significantly. Similar results were obtained with the unweighted data using MANOVA, Pillai’s Trace = .17, $F(9, 2222) = 50.24$, $p < .001$. In this analysis, however, men’s lesbian thermometer ratings were significantly more negative than those of women, although the effect size was small (partial $\eta^2 \leq .005$). Thus, although

this difference achieved statistical significance in the raw data, the pattern did not persist when the data were adjusted to better describe the U.S. population.

Hypothesis 3: Attitudes Toward Transgender People and Binary Conceptions of Gender

Nearly half of respondents (46.5%) agreed that “there is not enough respect for the natural divisions between the sexes,” whereas 19.5% disagreed and 34.0% reported they were “in the middle.” Men and women did not differ significantly in their responses. As predicted, attitudes toward transgender people were significantly correlated with endorsement of gender binary beliefs, $r(2281) = -.26$, $p < .001$. ($M = 3.40$, $CI = 3.33–3.48$; higher scores indicate greater agreement on the 1–5 scale). Non-overlapping confidence intervals indicate that mean transgender thermometer scores were significantly lower among respondents who agreed with the gender binary item ($M = 25.84$, $CI = 23.33–28.35$) compared to those who disagreed ($M = 42.53$, $CI = 38.38–46.68$). Both groups differed significantly from those who were in the middle ($M = 34.51$, $CI = 31.45–37.58$).

Hypothesis 4: Other Correlates of Attitudes Toward Transgender People

In response to the authoritarianism item, 62.0% of respondents agreed (“strongly” or “somewhat”) that “Obedience and respect for authority are the most important virtues children should learn,” whereas 17.8% disagreed and 20.3% were in

the middle ($M=3.69$, $CI=3.61–3.76$; higher scores indicate greater agreement on the 1–5 scale). As predicted, negative attitudes (i.e., lower thermometer ratings) were associated with higher levels of authoritarianism, $r(2269)=-.25$ ($p<.001$). Mean transgender thermometer scores of those who agreed with the authoritarianism item ($M=27.46$, $CI=25.24–29.69$) were significantly lower than those who disagreed ($M=43.30$, $CI=39.43–47.16$) or were in the middle ($M=36.30$, $CI=32.48–40.12$).

For the anti-egalitarianism item, 41.5% agreed that “We have gone too far in pushing equal rights in this country,” whereas 32.6% disagreed and 25.9% were in the middle ($M=3.11$, $CI=3.02–3.20$). Lower transgender thermometer scores were associated with more anti-egalitarian attitudes, $r(2272)=-.34$ ($p<.001$). Respondents who agreed ($M=21.98$, $CI=19.54–24.43$) rated transgender people significantly lower than did those who disagreed ($M=43.49$, $CI=40.75–46.23$), and both groups differed from those who were in the middle ($M=33.76$, $CI=29.96–37.56$).

A plurality of respondents described their political ideology as moderate or middle of the road (42.8%), whereas 26.5% indicated they were liberal to some degree (ranging from “strongly” to “slightly”) and 30.7% were conservative. Higher scores (greater conservatism) on the 7-point ideology scale ($M=4.09$, $CI=4.00–4.19$; median=4) were significantly associated with less favorable ratings of transgender people, $r(2211)=-.21$ ($p<.001$). Conservative respondents gave significantly lower thermometer ratings ($M=25.39$, $CI=22.50–28.28$) than moderates ($M=32.18$, $CI=29.39–34.98$), who in turn gave significantly lower ratings than liberals ($M=39.23$, $CI=35.68–42.78$).

Overall, approximately equal proportions of respondents reported that they get “quite a bit” (25.4%) or “a great deal” (25.6%) of guidance from religion in their day-to-day living; 32.0% received “some” guidance, 17.1% received “none at all.” For the 4-point response scale, $M=2.59$ ($CI=2.52–2.66$); median=3 (“quite a bit” of guidance). As predicted, higher levels of religiosity were associated with lower thermometer scores, $r(2270)=-.14$ ($p<.001$). Mean transgender ratings were significantly more negative among those who received “a great deal” of guidance ($M=24.79$, $CI=21.59–27.99$) than those who responded “quite a bit” ($M=33.55$, $CI=29.82–37.28$), “some” ($M=34.60$, $CI=31.67–37.54$) or “none at all” ($M=35.78$, $CI=31.07–40.48$).

In contrast to the authoritarianism, anti-egalitarianism, and political ideology items, men and women differed significantly in their levels of religiosity. For women, $M=2.73$ ($CI=2.63–2.82$); for men, $M=2.46$ ($CI=2.35–2.56$), $t(2269)=3.79$, $p<.001$. Women were more likely than men to say they received “a great deal” of guidance (30.5% vs. 20.5%) whereas men were more likely to say they received “none at all” (21.2% vs. 13.1%), $\chi^2(3, N=2270)=44.42$, $p<.001$. Computation of separate correlation coefficients for men and women revealed that the association between religiosity and transgender attitudes was significant only for women, $r(1268)=-.30$ ($p<.001$). For men, by contrast, $r(1002)=-.02$ (n.s.). (Table 3 reports all of the correlation coefficients separately for women and men.)

Also as predicted, ratings of transgender people were associated with prior contact with a gay or lesbian person. We included gender in this analysis because such contact was reported by significantly more women (83.9%) than men (76.4%), $\chi^2(1, N=2280)=20.27$, $p<.01$. With gender

Table 3 Correlation matrix of key variables used in regression analysis

	1	2	3	4	5	6	7	8	9	10	11	12
1. TG Thermometer		.10**	.04	.02	.18***	-.14*	-.10	-.36***	-.02	-.20*	-.18**	-.45***
2. Non-Hispanic Black	-.00		-.13***	-.08***	.02	-.20***	-.07*	-.20***	.13***	.03	.04	.06*
3. Hispanic	.02	-.15***		-.09***	-.05	-.16***	-.01	-.02	-.10*	.02	-.07	-.07
4. Other race/ethnicity	-.00	-.12***	-.13***		.12*	-.06	-.06	-.08*	.02	.00	-.12*	-.07
5. Educational level	.19**	.07*	-.03	-.07		-.24***	.06	-.14**	.08	-.10	-.14**	-.14**
6. Residence (1=rural/small town)	-.11	-.17***	-.11**	-.08	-.15**		.11*	.21***	.03	.03	.19***	.13*
7. Political Conservatism	-.27***	-.13***	-.02	.01	-.09	.12*		.23***	.22***	.09	.12*	.18***
8. Anti-egalitarianism	-.29***	-.16***	-.07	-.03	-.19***	.18***	.32***		.07	.25**	.35***	.41***
9. Religiosity	-.32***	.14***	-.04	-.09	.01	.09	.26***	.14*		.06	.17**	.19***
10. Gender binary beliefs	-.29***	.06*	-.02	.03	-.13**	.06	.25***	.39***	.19***		.19*	.39***
11. Authoritarianism	-.26***	.01	-.04	.07	-.20***	.14**	.15**	.39***	.16***	.36***		.23***
12. ATG	-.57***	.08**	-.08*	-.10*	-.19***	.21***	.34***	.46***	.41***	.40***	.28***	

Note: * $p<.05$. ** $p<.01$. *** $p<.001$. Women’s correlation coefficients are below the diagonal; men’s are above. Transgender scores (TG Thermometer) range from 0 to 100; higher scores indicate more positive feelings. For each race/ethnicity category, 0’s indicate non-Black, non-Hispanic, and non-Other, respectively. For variables labeled 5 and 7–11, higher scores indicate greater levels of that variable. ATG = Attitudes Toward Gay Men scale. ATG scores range from 1 to 5; higher values indicate greater sexual prejudice

statistically controlled, thermometer scores were significantly higher for respondents reporting contact than for those who lacked such contact, $t(2280)=6.13$, $p<.001$.

Hypothesis 5: Gender Differences in the Psychological Sources of Attitudes Toward Transgender People

Using ordinary least squares regression with transgender thermometer scores as the dependent variable, we tested the hypothesis that heterosexual men's attitudes toward sexual and gender minorities share common social psychological roots to a greater extent than is the case for heterosexual women's attitudes. In the first equation, we created multiplicative interaction terms to test for statistically significant gender differences in the influence of the variables specified by Hypotheses #3 and #4 (i.e., gender binary beliefs, authoritarianism, religiosity, political ideology, and anti-

egalitarianism; as noted above, the contact variable was excluded). We first entered respondent gender (1 = woman, 0 = man) and the other variables into the equation. Next we entered the interaction terms (gender X each variable). If Hypothesis #5 is correct, the latter terms should yield statistically significant regression coefficients, indicating that each variable's association with transgender attitudes is significantly different for men and women, controlling for the other variables in the equation. The interaction terms and the continuous variables from which they were computed were centered to reduce multicollinearity (Aiken and West 1991).

As in previous analyses, we controlled for race and ethnicity, educational level, and type of residence locale. We entered a 7-point continuous variable for educational level (ranging from less than high school to doctoral degree) and three dummy variables for race and ethnicity (values of 1 = Black, non-Black Hispanic, and other/mixed race,

Table 4 Regression analysis: Predictors of transgender feeling thermometer scores

	Model 1: All gender interaction terms included	Model 2: Nonsignificant gender interaction terms excluded	Model 3: ATG included
Predictor	<i>b</i>	<i>b</i>	<i>b</i>
Constant	22.89***	22.26***	25.67***
Gender (1 = female, 0 = male)	7.31	7.93***	4.02**
Race			
Non-Hispanic Black	2.57	-.43	3.51
Hispanic	2.26	.69	-.18
Other race/ethnicity	.54	-1.70	-3.80
Educational level	2.92*	3.20***	2.27**
Residence (1 = rural/small town)	-4.04	-2.74	-.82
Political conservatism	-1.09	-1.59*	-.70
Anti-egalitarianism	-4.88***	-4.04***	-1.59*
Religiosity	.46	.64	2.04
Gender binary beliefs	-2.64*	-2.34**	-.33
Authoritarianism	-1.22	-1.76*	-1.42*
Gender x Religiosity	-5.60***	-5.88***	-4.56***
Gender x Race			
Non-Hispanic Black Women	-5.75	—	—
Hispanic Women	-3.13	—	—
Other race/ethnicity Women	-3.62	—	—
Gender x Education	.40	—	—
Gender x Residence	2.63	—	—
Gender x Political Conservatism	-1.09	—	—
Gender x Anti-egalitarianism	-1.75	—	—
Gender x Gender binary beliefs	.69	—	—
Gender x Authoritarianism	-1.11	—	—
Attitudes toward gay men (ATG)	—	—	-10.34***
R^2	.2174	.2126	.3159
$F(df)$	18.35 (21, 2135)	29.96 (12, 2144)	47.39 (13, 2143)

Note. Table reports unstandardized regression coefficients (*b*) for each variable

* $p<.05$. ** $p\leq.01$. *** $p\leq.001$

respectively) with non-Hispanic Whites as the comparison group (= 0 for all three variables). Residence locale was dichotomized (1 = rural area or small town; 0 = city or suburb).

As shown in Table 4, this equation (labeled Model 1) explained 21.74% of the variance, $F(21, 2135)=18.35$ ($p<.001$). The only statistically significant interaction term was between gender and religiosity: Religiosity significantly predicted women's transgender attitudes but not those of men. When separate regression equations were constructed for men and women respondents using religiosity as the sole independent variable, it explained 9.0% of the variance for women but less than 0.1% of the variance in men's attitudes (not shown in Table 4).

Thus, with the exception of religiosity, the relationships between the independent variables and transgender attitudes did not differ significantly between men and women, contrary to Hypothesis #5. Moreover, the fact that religiosity was unrelated to men's transgender attitudes rendered moot the prediction that its regression coefficient would become nonsignificant with sexual prejudice controlled. A remaining question was whether the inclusion of sexual prejudice in the model would affect the contribution of the other variables to transgender attitudes.

A second equation was computed (Model 2) that included all of the independent variables from Model 1 but dropped the nonsignificant interaction terms. As shown in Table 4, Model 2 explained 21.26% of the variance, $F(12, 2144)=29.96$ ($p<.001$), which was not significantly different from Model 1. Consistent with the earlier correlational analyses, higher transgender thermometer scores were predicted by higher educational levels, less endorsement of a gender binary, and lower levels of authoritarianism, political conservatism, and anti-egalitarian attitudes. Gender remained a significant predictor, as did the interaction of gender and religiosity.

ATG scores were added in Model 3. (ATL scores were excluded because of their high correlation with ATG scores [$r=.73$], and because Hypothesis #5 emphasizes the importance of attitudes toward gay men in shaping heterosexual men's attitudes toward transgender people.) The resultant equation explained 31.59% of the variance in transgender thermometer scores, a significant increase over Model 2, $F_{change}(1, 2144)=323.44$, $p<.001$. In this equation, authoritarianism and anti-egalitarianism remained significant predictors for the entire sample and religiosity remained a significant predictor for women, indicating that these variables contribute to the variance in transgender thermometer scores beyond the role they play in predicting attitudes toward gay men. Gender and educational level also continued to be significant predictors. (For the three equations in Table 4, the estimated Variance Inflation Factor did not exceed 3.0 for any variable or interaction term, nor was tolerance less than 0.35 for any variable or interaction term.)

Thus, Hypothesis #5 received only limited support. As expected, the associations between heterosexual men's attitudes toward transgender people and their political and gender beliefs were reduced to nonsignificance when their attitudes toward gay men were statistically controlled. However, this was also the case for women respondents. Consistent with the hypothesis, religiosity remained a significant predictor of women's transgender attitudes when attitudes toward gay men were statistically controlled; but it was not a significant predictor of men's attitudes, even without controlling ATG scores. With ATG scores controlled, women's attitudes were additionally predicted by authoritarianism and anti-egalitarianism but, contrary to Hypothesis #5, this was also the case for men. Thus, most of the predicted gender differences in the psychological roots of transgender attitudes were not observed. And whereas heterosexual men's and women's attitudes toward transgender people shared many common sources with their attitudes toward gay men, they also were independently predicted by variables such as authoritarianism and anti-egalitarianism.

Discussion

U.S. heterosexual adults' feeling thermometer ratings for *transgender people* were strongly correlated with their thermometer scores for gay, lesbian, and bisexual targets, although it is noteworthy that attitudes toward transgender people were significantly more negative than attitudes toward sexual minorities. The significant correlations between transgender thermometer ratings and scores on the ATG and ATL scales—which, in contrast to the thermometers, focus on condemnation and tolerance of gay men and lesbians (Herek 2009a)—provide further evidence of a strong psychological linkage between the two attitude domains.

As hypothesized, heterosexuals' attitudes toward transgender people displayed many of the patterns consistently observed in their attitudes toward gay men, lesbians, and bisexuals. They were significantly correlated with higher levels of psychological authoritarianism, political conservatism and anti-egalitarianism, and (for women) religiosity—variables that are also consistent predictors of sexual prejudice. These patterns suggest that negative attitudes toward transgender people may have their psychological roots in strong support for existing social conventions, power hierarchies, and traditional values. In this respect, they are similar not only to sexual prejudice but also to negative attitudes toward outgroups in general (Duckitt 1992).

In addition, heterosexuals' attitudes toward transgender people varied according to the extent of their personal contact with sexual minorities. This pattern is consistent

with the findings of Tee and Hegarty (2006), and suggests that the effects of contact with sexual minorities may influence attitudes toward gender minorities, i.e., a secondary transfer effect (Pettigrew 2009; Tausch et al. 2010). Such an effect could have multiple sources. Insofar as gay and lesbian communities are more accepting of gender nonconformity than is society at large, heterosexuals who have known gay and lesbian people may be more likely to encounter viewpoints that challenge traditional notions of gender. They also may be aware of the gay community's efforts to secure equal rights and legal protections, and might see parallels between those issues and the political struggles of transgender people. Prior contact with gay and lesbian persons may also reflect or promote greater understanding for and tolerance of difference generally. Any conclusions in this regard are necessarily tentative because respondents' contact experiences with transgender people were not assessed in the present study. It is possible that heterosexuals with gay or lesbian friends and family members have a greater chance of also knowing transgender individuals (some of whom self-identify as gay or lesbian), which could directly influence their attitudes toward transgender people as a group, consistent with the traditional contact hypothesis (Pettigrew and Tropp 2006). It seems reasonable, however, to assume that the proportion of respondents in the present study who knew a gay man or lesbian (roughly 80%) was substantially higher than the proportion who knew a transgender person (Tee and Hegarty 2006).

As hypothesized, attitudes toward transgender people were more negative among heterosexual men than women. This finding is consistent with prior research in several countries (Hill and Willoughby 2005; Landén and Innala 2000; Tee and Hegarty 2006; Winter et al. 2008), including the United States (Nagoshi et al. 2008). It mirrors a reliable pattern observed in research on sexual prejudice, namely, that heterosexual men generally express more negative attitudes toward sexual minorities—especially gay and bisexual men—than do heterosexual women (Herek 2002a; Kite and Whitley 1998). Men's greater negativity toward transgender people is consistent with the notion that they are more invested than women in adhering to gender norms, presumably as a means of affirming their own masculinity and heterosexuality (e.g., Herek 1986; Kimmel 1997). To the extent that they perceive transgender identities as destabilizing to a binary conception of gender, and thus blurring the definition of sexual orientation as well (Moradi et al. 2009), some heterosexual men may perceive transgender people as especially threatening. Devaluing them may be a response to such a threat.

This analysis is also consistent with the finding concerning belief in a gender binary. As described above, Garfinkel (1967) suggested that people who cross over from one gender to another (or who cannot be easily categorized as men or

women) evoke negative reactions because they violate the widespread assumption that sex and gender are “naturally” dichotomous. He did not posit any systematic relationship between endorsement of the natural attitude and acceptance of people like “Agnes,” the transsexual subject of his case study. However, the current data indicate they are negatively correlated. Men and women alike expressed more negative attitudes toward transgender people to the extent that they also endorsed a binary conception of sex.

Drawing from previous research (Nagoshi et al. 2008), we hypothesized that the psychological sources of attitudes toward transgender people differ for men and women. The results of the regression analysis, however, only partially supported this hypothesis. As expected, heterosexual men's attitudes toward transgender people were not predicted by political conservatism or belief in a gender binary when their attitudes toward gay men were statistically controlled. Contrary to the hypothesis, however, this was also the case for women's attitudes. Sexual prejudice explained a considerable amount of additional variance when it was added to the equation, but authoritarianism and anti-egalitarianism remained significant predictors of attitudes toward transgender people for women and men alike. Thus, although heterosexuals' attitudes toward transgender people and gay men share many common psychological sources, there is also considerable non-overlap for both men and women.

The unique roles played by authoritarianism, anti-egalitarianism, and religiosity in explaining transgender attitudes—beyond their relationship to sexual prejudice—warrant further study. Given that rigid adherence to rules and intolerance for ambiguity figure prominently in authoritarianism, it is perhaps not surprising that this variable predicts attitudes toward transgender people, who may be perceived as blurring traditional boundaries and calling into question the intelligibility of existing “rules” about gender in more fundamental ways than do sexual minorities. The fact that anti-egalitarian attitudes (operationalized as agreement that “We have gone too far in pushing equal rights in this country”) predicted attitudes toward transgender people even when sexual prejudice was statistically controlled suggests that at least some heterosexuals who express positive attitudes toward sexual minorities (and, presumably, accept the notion of equality for them) may “draw the line” at accepting transgender people. This may result from a perception that transgender people violate social norms in a more fundamental way than do lesbian, gay, and bisexual people. It may also reflect the relatively recent emergence of transgender issues in public discourse; many heterosexuals who have come to support sexual minority rights may remain unfamiliar with the specific challenges confronting gender minorities.

The only reliable gender difference observed in the predictors of sexual prejudice was related to religiosity. Even

with sexual prejudice statistically controlled, women held more negative attitudes toward transgender people to the extent they said religion provided greater guidance in their daily lives. For men, by contrast, religiosity and transgender attitudes were uncorrelated. The present data do not provide an explanation for this pattern. We note, however, that previous research has documented religion-by-gender interactions in related attitude domains. For example, in a national survey of heterosexuals' attitudes toward bisexual women and men, highly religious women respondents (measured by frequency of religious attendance) assigned significantly lower thermometer scores to bisexuals than did other respondents (Herek 2002b). These findings suggest that attitudes toward transgender people (and, perhaps, sexual minorities) may be more likely to serve a value-expressive function for women than for men, that is, they may provide the individual with a vehicle for expressing her identity as a religious or non-religious person (Herek 1987; Maio and Olson 2000). For men, by contrast, transgender attitudes may serve other psychological functions. For example, they may arise from a need to reduce the anxiety that results when gender and sexual boundaries are blurred (a defensive function) or a need to be accepted by peers (a social-expressive function). Gender differences in the underlying motivations for heterosexuals' attitudes toward transgender people are a promising area for future research.

The present study has important strengths. It provides valuable information about a phenomenon that has received relatively little attention from social science researchers. Notably, the use of a large and diverse national probability sample allows the findings to be generalized to the U.S. adult population in a way that has not been possible with previous research in this area, much of which relied on data from college students. Although student samples can yield useful insights, they have important limitations for prejudice research. Not only are they restricted on relevant demographic and developmental variables (e.g., educational level, age, social class), they also may reflect psychological processes that are strongly influenced by the generally liberal and egalitarian culture common to most campuses (e.g., Henry 2008; Sears 1986). By contrast, findings from the present sample can be considered generally representative of the heterosexual adult population of the United States at the time the survey was conducted. Consequently, they provide a useful benchmark and a context for understanding the findings of future studies.

In addition, the use of feeling thermometers is a strength insofar as it permits direct comparisons of respondents' attitudes toward transgender people with other groups—including sexual minorities—using a single metric. At the same time, a feeling thermometer constitutes a single-item measure, which inevitably cannot sample all aspects of attitudes toward the group. Egalitarianism, authoritarianism,

religiosity, and belief in a gender binary also were each measured with single items in the present study. This measurement strategy was necessitated by the funding and time constraints associated with administering a lengthy questionnaire to a national probability sample. In future research, however, it will be desirable to replicate the present findings using multi-item measures with established reliability and validity. In addition to this limitation, the data from the present study—as is the case in all surveys—are subject to possible error related to sampling, telephone noncoverage, and problems with question wording.

The present findings suggest many promising questions for future research on attitudes toward transgender people, two of which we highlight here. First, given the multiplicity of gender identities and expressions encompassed by *transgender*, it will be valuable to conduct research to further illuminate how heterosexuals understand this term and whether the meanings they attach to it differ across situations. For example, do they think mainly of individuals who desire or have had a sex change, individuals who cross-dress but do not disidentify with the gender ascribed to them at birth, individuals who self-identify neither as men nor women, or some other non-normative expression of gender? It will also be useful to assess whether and when heterosexuals are more likely to think of the term *transgender* as referring to a male-bodied person who is transgressing gender norms or to a female-bodied person who is doing so.

Second, Garfinkel suggested that violations of the “natural attitude” toward gender are also viewed as a form of *moral* transgression that extends beyond the realm of gender to encompass a gender-variant person's overall character. Indeed, negative views of transgender people have long been posited to reflect a belief that transgender people are deceiving themselves and others by pretending to be something they are not (e.g., Raymond 1979; for a critique, see Namaste 2000). The argument that transgender people are perpetrators of “fraud” has been used in custody battles involving a transgender parent (Flynn 2006) and even as part of the defense in murder cases involving a transgender victim (Juang 2006). Investigation of whether deviation from a gender binary is widely perceived as fundamentally damning to transgender people's overall trustworthiness in other domains, and the roots of this belief, may provide insights into prejudice and discrimination directed at gender minorities.

These results from the first survey of attitudes toward transgender people in a U.S. national probability sample indicate that negative attitudes are widespread. Further research is needed to improve our understanding of the many forms of prejudice and discrimination that transgender people encounter in everyday life, and to alleviate its negative effects.

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