Gender-Related Traits in Gay Men, Lesbian Women, and Heterosexual Men and Women: The Virtual Identity of Homosexual-Heterosexual Diagnosticity and Gender Diagnosticity

Richard A. Lippa
California State University, Fullerton

ABSTRACT Three studies investigated the relationship between gender-related traits and sexual orientation. Study 1 showed that gay men and lesbians in an unselected sample of 721 college students differed from same-sex heterosexuals most strongly on gender diagnosticity (GD) measures, which assess male- versus female-typicality of interests (effect sizes of 2.70 for men and .96 for women) and least strongly on measures of instrumentality (I) and expressiveness (E). In Study 2, GD measures showed large differences between 95 gay and 136 heterosexual men (effect sizes of 1.61 and 1.83) and between 46 lesbian and 225 heterosexual women (effect sizes of .98 and 1.28), whereas I and E showed much smaller differences. In Study 3, GD showed large differences between 90 gay and 81 heterosexual men (effect sizes of 1.76 and 1.97) and between 82 lesbians and 108 heterosexual women (effect sizes 1.67 and 1.70), whereas I and E showed much smaller differences. Using data from Studies 2 and 3, "gay-heterosexual diagnosticity" measures were computed for men and "lesbian-heterosexual diagnosticity" measures for women, based on occupational and hobby preferences. These measures correlated very strongly with GD measures.

Correspondence concerning this article should be addressed to Richard Lippa, Department of Psychology, California State University at Fullerton, PO Box 6846, Fullerton, CA 92834-6846; e-mail: rlippa@fullerton.edu

Journal of Personality 68:5, October 2000.

Common stereotypes portray gay men to be more feminine than heterosexual men and lesbian women to be more masculine than heterosexual women (Kite & Deaux, 1984). Psychological research provides some support for these stereotypes. For example, on average, gay men are more feminine than heterosexual men and lesbians are more masculine than heterosexual women on bipolar masculinity-femininity (M-F) scales (Haslam, 1997; Pillard, 1991), and homosexual and heterosexual individuals sometimes differ on measures of masculine instrumentality (I) and feminine expressiveness (E) (see Pillard, 1991). Finally, gay men and lesbians differ from same-sex heterosexuals on measures that assess the male- versus female-typicality of their interests and occupational preferences (Bailey, Finkel, Blackwelder, & Bailey, 1996; Lippa & Arad, 1997).

Considerable research has documented a relationship between sex-typical and atypical behaviors in children and their later sexual orientation (see Bailey & Zucker, 1995, for a meta-analysis). The mean effect size for the association between boys' sex-typed behaviors and adult sexual orientation is large (Cohen's $d = 1.31$); effect sizes for females are smaller (mean = .96), but still large. As Bailey, Finkel, Blackwelder, and Bailey (1996, p. 4) note, "It seems unlikely that the large heterosexual-homosexual differences in childhood sex-atypicality simply disappear in adulthood. However, the status of adult differences is much less clear than for childhood differences." One reason for this is that many of the indicators used in studies of children (e.g., toy and playmate preferences) are inappropriate for studies of adults, which have tended to focus instead on self-report scales of M-F, I, and E as their operationalizations of sex typing. These scales assess a variety of gender-related domains, including self-reports of instrumental and expressive personality traits and gender-related interests, attitudes, hobbies, and occupational preferences.

Given the diversity of measures used to assess adult sex typing, an obvious question for researchers is: Which kinds of gender-related traits show the largest relationship to adult sexual orientation? If, indeed, some gender-related traits show stronger associations with sexual orientation than others, does this then have implications for theories of sex typing and sexual orientation?

Why Should Gender-Related Traits Be Linked to Sexual Orientation?

In their meta-analytic review, Bailey and Zucker (1995) classified explanations for the association between childhood sex typing and adult sexual orientation into two broad categories: biological theories and psychosocial theories. Biological theories propose genetic factors, hormonal influences, and neural structures, which are presumed to play a central role in the development of sexual orientation and sex-typed behaviors, whereas psychosocial theories emphasize the importance of psychological and environmental factors, such as socialization, peer influences, parental reinforcement, and the development of gender-related self-concepts.

Recent biological theories of sexual orientation have focused on the causal importance of genetic factors and biologically active environmental factors (such as maternal stress and its biochemical correlates, uterine environment, maternal immunological reactions, and so on). These factors are presumed to influence the degree of prenatal masculinization and defeminization of neural structures responsible for sexual orientation and other sex-typed behaviors (see Bailey, 1995; Ellis, 1996a, 1996b; Meyer-Bahlbur, 1984, for reviews). Stripped of their specific details, these theories propose biological "third variables" (e.g., genetic factors, prenatal hormones, neural structures), which are thought to influence both sex-typed behaviors and sexual orientation. The causal pathway linking sexual orientation and sex-typed behavior is presumed to be direct and straightforward (e.g., prenatal hormones "masculinize" or "defemininize" neural structures responsible for both sexual orientation and sex-typed behaviors), and, therefore, such theories would seem to predict a relatively strong association between sex-typed behaviors and sexual orientation. Biological theories, however, tend to remain silent as to which kinds of gender-related behaviors are hypothesized to show the strongest association with sexual orientation.

Psychosocial explanations for observed links between sex-typed behaviors and sexual orientation include differential reinforcement theory (see Bailey & Zucker, 1995), sex-role identity theory (e.g., Kagan, 1964; Kohlberg, 1966), and D. J. Bem's (1996) "exotic becomes erotic" theory. All of these theories would seem to imply weak links between sex-typed behaviors and sexual orientation. This inference follows from the complexity of the causal sequences proposed, and the "noisiness" of the

psychological and environmental variables deemed critical by each theory. Like biological theories, psychosocial theories often are vague about what kinds of sex-typed behaviors are predicted to show the strongest links to sexual orientation.

The research reported here assessed the strength of links between sexual orientation and various gender-related traits in adults, and it investigated the kinds of gender-related traits that show the strongest links to sexual orientation in adults. Therefore, the current research provides new evidence about the plausibility of biological and psychosocial explanations for the linkage between sex typing and sexual orientation.

The Measurement of Gender-Related Traits

Because the assessment of gender-related traits in adults is central to the current research, it is useful to briefly review the history of research on this topic. Modern work began with the 1936 publication of Terman and Miles's *Sex and Personality*, which presented a bipolar conception of Masculinity-Femininity (M-F). In essence, this approach held M-F to be a single dimension, with masculinity and femininity as mutually exclusive end points. Many M-F scales were developed in the Terman and Miles tradition. Research using such scales has consistently found that gay men on average are more feminine and lesbian women are more masculine than same-sex heterosexuals (see Haslam, 1997; Pillard, 1991).

In the early 1970s, the bipolar approach to M-F was supplanted by a two-dimensional conception of masculinity and femininity, which has been dominant for the past 25 years. The two-dimensional approach defines masculinity in terms of instrumental personality traits and femininity in terms of expressive traits. During the 1970s, a number of self-report inventories were developed to assess instrumentality (I) and expressiveness (E) as two separate dimensions, the best known being the Bem Sex-Role Inventory (BSRI; Bem, 1974, 1981) and the Personal Attributes Questionnaire (PAQ; Spence & Helmreich, 1978; Spence, Helmreich, & Stapp, 1974). A number of studies have investigated the relationship between individuals' sexual orientation and their I and E scores (e.g., Bailey et al., 1996; Spence & Helmreich, 1978; see Pillard, 1991, for a review). The trend is for gay men to score as high as heterosexual men on I but somewhat higher on E, and for lesbian women score as high as heterosexual women on E but somewhat higher on I.

A third approach to assessing within-sex gender-related individual differences—an approach termed gender diagnosticity (GD)—has emerged over the past decade (Lippa, 1991, 1995; Lippa & Connelly, 1990). GD refers to the Bayesian probability that an individual is predicted to be male or female based on some set of gender-related indicators (such as occupational or hobby preferences). GD is formally computed from sets of indicators (such as occupational and hobby preference ratings) through the application of discriminant analyses (see Lippa, 1991, 1995; Lippa & Connelly, 1990; this process will be described more fully later in this article). Research shows that GD can be measured reliably within the sexes from self-report data and that GD measures are factorially distinct from I and E as assessed by the PAQ and BSRI (Lippa, 1991, 1995; Lippa & Connelly, 1990). Unlike I and E, GD measures are largely independent of the Big Five personality superfactors (Lippa, 1991, 1995), and they often predict varied gender-related behaviors and attitudes within the sexes better than I and E do (see Lippa, in press, for a review).

Lippa and Arad (1997) found that GD measures were more strongly associated with men's sexual orientation than either I or E were. The current research replicates these findings in larger samples of homosexual and heterosexual individuals. It also assesses individuals on self-ascribed masculinity and femininity as well as on GD, I, and E.

Study 1

METHOD

Participants

Participants were 721 college students (287 men and 434 women) who were students in four large human sexuality classes at California State University, Fullerton. The sample was ethnically diverse, with 42% labeling themselves as White, 22% as Hispanic, 21% as Asian, and the remainder falling into other categories. The median age was 22.

Measures

Participants completed an anonymous questionnaire packet, which included the PAQ (as presented in Spence & Helmreich, 1978), and a section that asked participants to rate their degree of preference for 74 occupations on a 5-point scale ranging from "1—strongly dislike" to "5—strongly like." Occupational preference ratings were used to compute GD scores. Participants also completed

a 6-item scale by Storms (1979), which assessed their self-ascribed masculinity and femininity (sample item: "In general, how masculine (feminine) do you feel you are?").

Participants' sexual identities were assessed by asking them to report which of the following labels they currently used to describe themselves: Heterosexual ("Straight"), Gay, Lesbian, Bisexual, or Transsexual and/or Transgender. As a measure of the "desire" component of sexual orientation, participants also responded to the following two items: "I am sexually attracted to men" and "I am sexually attracted to women." Participants responded on a 7-point scale ranging from "strongly disagree" to "strongly agree."

RESULTS

Computation and Reliability of Measures of Gender-Related Traits

Gender diagnostic probabilities were computed by applying multiple discriminant analyses to seven nonoverlapping subsets of participants' 74 occupational preference ratings (see Lippa & Connelly, 1990; Lippa, 1995, for a more complete discussion of computation methods). In essence, these measures give the probability that an individual is predicted to be male or female based on his or her pattern of occupational preference ratings. The reliabilities of averaged GD probabilities were high for all participants ($\alpha = .91$), as well as for men only (.82) and for women only (.79).

PAQ I and E were computed in standard ways (however, items were averaged rather than summed), and their reliabilities were respectively .72 and .78. The three items assessing self-ascribed masculinity were averaged from Storms's (1979) scale, as were the three items assessing self-ascribed femininity. The reliabilities of self-ascribed masculinity were for .83 men and .81 for women, and the reliabilities of self-ascribed femininity were .86 for men and .86 for women. Self- ascribed masculinity and femininity were negatively correlated both for men ($r = –.13$, $p < .05$) and for women ($r = –.53$, $p < .001$).

Comparing Sexual Orientation Groups on Gender-Related Traits

Of the 272 men who responded to sexual identity questions, 258 (95%) described themselves as heterosexual, 8 (3%) as bisexual, and 6 (2%) as

gay. Of the 412 women who responded to sexual identity questions, 399 (97%) described themselves as heterosexual, 8 (2%) as bisexual, and 5 (1%) as lesbian. These incidence statistics are consistent with findings of recent large-scale sex surveys and reviews (e.g., Diamond, 1993; Laumann, Gagnon, Michael, & Michaels, 1994).

In the analyses that follow, mean scores on gender-related traits (I, E, GD, and self-ascribed masculinity and femininity) are compared for contrasting sexual orientation groups. Additional sexual orientation classifications were created based on participants' responses to the two sexual desire items: "I am sexually attracted to men" and "I am sexually attracted to women." Specifically, men were classified as "mostly attracted to men" if they responded "4," "5," "6," or "7" to the item "I am sexually attracted to men" (on a 7-point scale ranging from "1—strongly disagree" to "7—strongly agree"). Conversely, they were classified as "mostly not attracted to men" if they responded "1," "2," or "3" to the same item. Based on these criteria, 29 out of 284 men (10%) were classified as "mostly attracted to men" and 255 out of 284 men (90%) were classified as "mostly not attracted to men." In a corresponding manner, women were classified as "mostly attracted to women" versus "mostly not attracted to women" based on their response to the item "I am sexually attracted to women." Based on these criteria, 51 out of 429 women (12%) were classified as "mostly attracted to women" and 378 out of 429 (88%) were classified as "mostly not attracted to women."

In a final classification, men were classified as expressing "any attraction to men" if they responded greater than "1—strongly disagree" to the item, "I am sexually attracted to men," whereas they were classified as expressing "no attraction to men" if they responded "1." Similarly, women were classified as expressing "any attraction to women" if they responded greater than "1—strongly disagree" to the item, "I am sexually attracted to women," whereas they were classified as expressing "no attraction to women" if they responded "1." By this classification scheme, 54 out of 284 men (19%) classified as showing "any attraction to men" and 230 out of 284 (81%) showed "no attraction to men." Similarly, 103 out of 429 women (24%) classified as showing "any attraction to women" and 326 out of 429 (76%) classified as showing "no attraction to women."

Table 1 presents differences in gender-related traits for men in contrasting sexual-orientation classifications, and Table 2 presents the corresponding results for women. Group means on gender-related traits are also presented in these tables. Differences between sexual orientation

Table 1
Effect Sizes for Differences in Gender-Related Traits for Men in Contrasted Sexual Orientation Groups (Study 1)

	GENDER-RELATED TRAITS				
Contrasted Groups	GD Occupations	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Gay (n = 6)	.30	3.27	4.02	2.94	2.61
vs.	–2.70***	–1.03*	.33	–1.54***	1.15**
Not Gay (n = 256–259)	.70	3.81	3.84	3.97	1.76
Gay/Bisexual (n = 14)	.41	3.58	3.89	3.22	2.50
vs.	–2.01***	–.43	.09	–1.22***	1.04***
Heterosexual (n = 248–250)	.70	3.81	3.84	3.99	1.74
Mostly Attracted to Men (n = 29)	.51	3.58	3.83	3.52	2.36
vs.	–1.36***	–.43*	–.01	–.68**	.87***
Mostly Not Attracted to Men (n = 252–255)	.71	3.81	3.83	3.99	1.72
Any Attraction to Men (n = 54)	.56	3.63	3.75	3.52	2.26
vs.	–1.07***	–.35*	–.20	–.78***	.81***
No Attraction to Men (n = 227–230)	.72	3.82	3.86	4.04	1.68

Note. Values on left side of cells are group means. Values in middle of cells are effect sizes.
* two-tailed $p < .05$
** two-tailed $p < .01$
*** two-tailed $p < .001$

groups (e.g., gay vs. nongay men) are presented in terms of effect sizes (Cohen's *d*-statistic). Statistically significant differences are indicated.

In general, Table 1 shows that in all classification systems, men in contrasting sexual orientation groups differed most strongly on GD measures, with gay and bisexual identity and same-sex attraction associated with more female-typical occupational preferences. Effect sizes were quite large for GD measures, ranging from 1.07 to 2.70. Contrasted

sexual orientation groups also differed substantially on self-ascribed masculinity and femininity, with same-sex attraction associated with higher femininity. Contrasted sexual orientation groups differed least on I and E.

As Table 1 shows, the mean GD score for self-identified gay men was .30, indicating that, on average, these men were more female- than male-typical in their occupational preferences. In comparison, the mean GD score for nongay men was .70, which is comparable to male means reported in previous GD research (e.g., Lippa, 1991, 1995). Even in the most inclusive classification of same-sex attraction, the mean GD score for men reporting any degree of same-sex attraction was .56, whereas the mean score for the group reporting no same-sex attraction was .72.

Table 2 presents corresponding results for women. Women with a lesbian or bisexual identity and women expressing same-sex attraction tended to show more male-typical occupational preferences than contrasting groups did. Effect sizes for GD measures were smaller than corresponding effects for men, ranging from .32 to .96. Lesbian and bisexual women reported higher levels of instrumentality than heterosexual women. Self-ascribed masculinity and femininity also showed some significant differences between contrasting sexual orientation groups, particularly for classifications based on sexual desire.

Because women's degree of sexual attraction to men was only weakly related to their degree of attraction to women ($r = -.23$, $p < .001$), Table 2 also contrasts groups of women based on their degree of attraction to men ("mostly attracted to men" vs. "mostly not attracted to men," and "any attraction to men" vs. "no attraction to men").[1] These classifications were defined exactly as they were for men. As Table 2 indicates, when classified in this fashion, women in contrasting groups showed strong differences on some gender-related traits.

DISCUSSION OF STUDY 1

The results show that in a large unselected sample of college students, sexual orientation—as defined in various ways—is strongly associated with some kinds of gender-related traits. Effect sizes for men were generally larger

1. The corresponding correlation for men was –.63 ($p < .001$). The difference between correlations for women and men was highly significant ($Z = 6.58$, $p < .001$). Thus, the current data replicate Lippa and Arad's (1997) finding that sexual orientation is much more bipolar for men than for women.

Table 2
Effect Sizes for Differences in Gender-Related Traits for Women in Contrasted Sexual Orientation Groups (Study 1)

	GENDER-RELATED TRAITS				
Contrasted Groups	GD Occupations	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Lesbian (n = 5)	.45	4.03	3.95	2.00	3.87
vs.	.96*	.78[m]	–.42	.23	–.35
Not Lesbian (n = 405–410)	.31	3.62	4.15	1.84	4.12
Lesbian/ Bisexual (n = 11)	.40	3.98	4.00	2.03	3.85
vs.	.61*	.72*	–.32	.28	–.38
Heterosexual (n = 399–404)	.31	3.62	4.15	1.83	4.12
Mostly Attracted to Women (n = 51)	.35	3.64	4.13	2.14	3.89
vs.	.32*	.03	–.04	.51**	–.35*
Mostly Not Attracted to Women (n = 373–378)	.30	3.62	4.15	1.79	4.14
Any Attraction to Women (n = 101–103)	.35	3.60	4.09	2.12	3.78
vs.	.32*	.07	–.16	.55***	–.63***
No Attraction to Women (n = 322–326)	.30	3.63	4.16	1.75	4.21
No Attraction to Men (n = 5)	.58	3.15	3.52	3.00	2.53
vs.	1.88**	–.94*	–1.36**	1.71***	–2.29***
Some Attraction to Men (n = 418–423)	.31	3.63	4.15	1.82	4.13

Table 2
(continued)

Contrasted Groups	GENDER-RELATED TRAITS: GD Occupations	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Mostly Not Attracted to Men (n = 15)	.47	3.41	3.84	2.31	3.29
vs.	1.14***	–.43	–.67*	.71**	–1.22***
Mostly Attracted to Men (n = 408–413)	.30	3.63	4.15	1.82	4.14

Note. Values on left side of cells are group means. Values in the center of cells are effect sizes.
m p = .08
* p < .05
** p < .01
*** p < .001

than for women, but many effects were large and statistically significant for both sexes. For men, effects were largest for GD measures. They were smaller but still quite strong for self-ascribed masculinity and femininity, and weakest for PAQ scales. For women, effects were strongest for GD, but they were also sometimes strong for PAQ I. Women's sexual orientation was significantly associated with self-ascribed masculinity and femininity, with women who were attracted to women reporting greater masculinity and less femininity than women who were not attracted to women.

One strength of Study 1 is that it made use of an unselected sample. The strength of Study 1, however, is simultaneously its limitation. Because it made use of an unselected sample, Study 1 identified only a relatively small number of sexual minority (gay, lesbian, and bisexual) participants. Studies 2 and 3 address this issue by assessing larger numbers of gay and lesbian participants.

Study 2

METHOD

Participants

Gay and lesbian participants were volunteers solicited from gay and lesbian student organizations, clubs, and political organizations in Orange County and Los Angeles, California. Ninety-four gay men participated. Sixty percent of these men were

White, 27% were Asian, 7% were Hispanic, and the remainder fell into other categories. The median age was 31. Forty-six lesbian women also participated. Seventy-nine percent of these women were White, 9% were Hispanic, 5% were Asian, and the remainder fell into other categories. The median age was 38.

Heterosexual participants were 361 college students (136 men and 225 women) who were students in two large human sexuality classes at California State University, Fullerton. This sample was ethnically diverse, with 42% labeling themselves as White, 20% as Hispanic, 25% as Asian, and the remainder falling into other categories. The median age of the heterosexual sample was 22.

Measures

All participants completed an anonymous questionnaire packet. Student participants received their questionnaires in class, took them home, and returned them anonymously to research assistants in subsequent classes. Gay and lesbian participants received their questionnaire packets with stamped, addressed envelopes attached, which permitted them to complete questionnaires privately and return them by mail. Questionnaire packets were much the same as those used in Study 1. The packets in Study 2 included a GD scale based on hobby as well as occupational preferences.

RESULTS

Computation and Reliability of Measures of Gender-Related Traits

Gender diagnostic probabilities were computed by applying multiple discriminant analyses to nine nonoverlapping subsets of participants' 74 occupational preference ratings and to six nonoverlapping subsets of participants' 60 hobby preferences. Because of the large number of gay and lesbian participants in the total sample, the heterosexual sample was tripled when computing gender diagnostic probabilities. The reason for this procedure was to guarantee that gay and lesbian participants constituted a minority of the sample used to compute GD scores. By tripling the heterosexual sample, gay and bisexual men became 27% of the augmented male sample, and lesbian and bisexual women became 8% of the augmented female sample. Gender diagnostic probabilities were then computed in the standard way. These measures give the probability that an individual is predicted to be male or female based on his or her pattern of occupational or hobby preference ratings. The sample was augmented only for the computation of gender diagnostic probabilities. In all other

analyses, the original sample is used. Over all participants in the original sample, the reliabilities of GD probabilities were .91 for occupations and .83 for hobbies. For men, corresponding reliabilities were .83 and .77, and for women .80 and .67.

PAQ I and E were computed as in Study 1; their reliabilities were respectively .74 and .78. The reliabilities of self-ascribed masculinity were .83 for men and .82 for women, and the reliabilities of self-ascribed femininity were .89 for men and .89 for women. Self- ascribed masculinity and femininity were negatively correlated for both men ($r = –.22$, $p < .01$) and for women ($r = –.55$, $p < .001$).

Comparing Sexual Orientation Groups on Gender-Related Traits

The data presented in Table 3 correspond directly to analyses presented in Study 1. They contrast the gender-related traits of gay and heterosexual men.

In general, GD measures showed the strongest differences between gay men and heterosexual men (effect sizes of 1.61 and 1.83). Self-ascribed femininity also showed large differences, with gay men describing themselves as being more feminine than heterosexual men (effect size of .66). Self-ascribed masculinity did not show a significant difference between gay and heterosexual men. Finally, I and E showed moderate but significant effects, with gay men scoring lower than heterosexual men on instrumentality and higher on expressiveness.

Table 4 presents the corresponding results for women. GD measures and self-ascribed masculinity and femininity showed the strongest differences between lesbian and heterosexual women (effect sizes ranging from .94 to 1.28). In contrast, I and E did not show significant differences between lesbian and heterosexual women.

Because Study 2 collected data from relatively large numbers of gay men and lesbian women, it was possible to compute "gay-heterosexual diagnosticity" measures for men, and "lesbian-heterosexual diagnosticity" measures for women. The method of computation was directly analogous to the computation of GD measures. Gay-heterosexual diagnostic probabilities were computed by applying multiple discriminant analyses to nine nonoverlapping subsets of men's 74 occupational preference ratings and six nonoverlapping subsets of participants' 60 hobby preferences. The grouping variable for these discriminant analyses, however, was sexual orientation (gay vs. heterosexual) rather than gender,

Table 3
Means and Standard Deviations of Gay and Heterosexual Men on Gender-Related Traits, and Effect Sizes for Differences Between Groups (Study 2)

	Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Means (*SD*s) for Gay Men (*n* = 93–94)	.48 (.14)	.47 (.14)	3.56 (.59)	4.03 (.45)	3.37 (.72)	2.14 (.75)
Means (*SD*s) for Heterosexual Men (*n* = 133–136)	.68 (.12)	.71 (.12)	3.82 (.49)	3.80 (.55)	3.48 (1.11)	1.66 (.71)
Effect sizes for Differences Between Groups	–1.61***	–1.83***	–.48***	.45**	–.12	.66***

Note. Effect sizes are positive when gay men are higher than heterosexual men, and negative when heterosexual men are higher than gay men. Higher GD scores are more male-typical.
* $p < .05$
** $p < .01$
*** $p < .001$

Table 4

Means and Standard Deviations of Lesbian and Heterosexual Women on Gender-Related Traits and Effect Sizes for Differences Between Groups (Study 2)

	Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Means (*SD*s) for Lesbian Women (*n* = 45–46)	.53 (.15)	.47 (.14)	3.63 (.53)	4.04 (.51)	2.42 (.75)	3.25 (.77)
Means (*SD*s) for Heterosexual Women (*n* = 221–225)	.36 (.13)	.34 (.13)	3.60 (.54)	4.17 (.46)	1.78 (.67)	4.13 (.72)
Effect Sizes for Differences Between Groups	1.28***	.98***	.05	–.29[m]	.94***	–1.22***

Note. Effect sizes are positive when lesbian women are higher than heterosexual women, and negative when heterosexual women are higher than lesbian women. Higher GD scores are more male-typical.

[m] $p = .076$

* $p < .05$

** $p < .01$

*** $p < .001$

and analyses were conducted just for men, not for men and women combined. Similarly, "lesbian-heterosexual" diagnosticity measures were computed for women. The reliability of gay-heterosexual diagnostic probabilities based on occupational preferences was .89, and the reliability of gay-heterosexual diagnostic probabilities based on hobby preferences was .88. Similarly, the reliability of lesbian-heterosexual diagnostic probabilities based on occupational preferences was .83, and the reliability of lesbian-heterosexual diagnostic probabilities based on hobby preferences was .72.

"Gay-heterosexual diagnosticity" measures lived up to their name, in that they successfully distinguished gay men from heterosexual men. Men with "gay-heterosexual diagnosticity" scores of greater than .5 were predicted to be gay, whereas men with scores less than or equal to .5 were predicted to be heterosexual. Using this classification criterion, 88% of men (119 of 136 heterosexual men, and 84 of 94 gay men) were correctly classified as to sexual orientation, based on their occupational preferences, and 90% of men (124 of 136 heterosexual men, and 83 of 95 gay men) were correctly classified based on hobby preferences. Similarly, women with "lesbian-heterosexual diagnosticity" scores of greater than .5 were predicted to be lesbian, whereas women with scores less than or equal to .5 were predicted to be heterosexual. Using this classification criterion, 85% of women (189 of 225 heterosexual women, and 41 of 46 lesbian women) were correctly classified as to sexual orientation, based on occupational preferences, and 81% of women (182 of 224 heterosexual women, and 37 or 46 lesbian women) were correctly classified based on hobby preferences.

Table 5 presents the correlations of men's "gay-heterosexual diagnosticity" scores and women's "lesbian-heterosexual diagnosticity" scores with their assessed gender-related traits. "Gay-heterosexual diagnosticity" correlated very strongly with GD measures, and less strongly, but still significantly, with I, E, self-ascribed masculinity, and self-ascribed femininity. When corrected for attenuation due to unreliability, the correlation between "gay-heterosexual diagnosticity" and GD based on occupational preferences was 1. Similarly, the correlation between "gay-heterosexual diagnosticity" and GD based on hobby preferences corrected to 1. For women, the correlation between "lesbian-heterosexual diagnosticity" and GD based on occupational preferences also corrected to 1, whereas the correlation between "lesbian-heterosexual diagnosticity" and GD based on hobby preferences corrected to .96.

Table 5

Correlations Between Homosexual-Heterosexual Diagnosticity Measures and Gender-Related Traits (Study 2)

	Correlations for Men Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Gay-Heterosexual Diagnosticity (Occupation) (n = 240–244)	–.88***	–.79***	–.33***	.23***	–.16*	.49***
Gay-Heterosexual Diagnosticity (Hobbies) (n = 240–244)	–.74***	–.87***	–.32***	.27***	–.11	.44***
	Correlations for Women Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Lesbian-Heterosexual Diagnosticity (Occupations) (n = 277–281)	.83***	.59***	.08	–.20**	.43***	–.56***
Lesbian-Heterosexual Diagnosticity (Hobbies) (n = 276–280)	.60***	.67***	.11	–.23***	.38***	–.52***

Note. GD measures are scored with higher scores more male-typical. Homosexual-heterosexual diagnosticity measures are scored with higher scores more homosexual-typical.

* two-tailed $p < .05$; ** two-tailed $p < .01$; *** two-tailed $p < .001$.

DISCUSSION OF STUDY 2

Study 2 extended the results of Study 1 by assessing relatively large groups of gay men and lesbians. In many ways, Study 2 replicated the results of Study 1. Gay men differed from heterosexual men most strongly on GD measures, and less strongly on I, E, and self-ascribed femininity. Lesbian women differed from heterosexual women most strongly on GD measures and self-ascribed masculinity and femininity, and less strongly on I and E.

Study 2 demonstrated that reliable "gay-heterosexual diagnosticity" measures could be computed for men, and reliable "lesbian-heterosexual diagnosticity" measures could be computed for women, based on participants' occupational and hobby preferences. These measures were very successful at distinguishing homosexuals from heterosexuals. Furthermore, for both men and women, "homosexual-heterosexual diagnosticity" measures correlated very strongly with GD measures. Thus, the reliable patterns of occupational and hobby preferences that distinguished gay men from heterosexual men (and lesbian women from heterosexual women) were exactly those that distinguished men from women in the larger sample. Given the strength of these results, it seemed appropriate to replicate them in another large sample of gay men and lesbians.

Study 3

METHOD

Participants

Gay and lesbian participants again were volunteers solicited from gay and lesbian student organizations, clubs, political organizations (and this time, coffee houses and bars as well) in Orange County and Los Angeles, California. This sample of volunteers was solicited with the intention of studying ethnic differences among Hispanic, Asian, and White gays and lesbians, so the sample was intentionally ethnically diverse. Ninety gay men participated in the study. Forty percent of these men were White, 31% were Asian, and 29% were Hispanic. Their median age was 28. Similarly, eighty-two lesbians participated in the study. Forty percent of these women were White, 31% were Hispanic, 29% were Asian. Their median age was 24.

Heterosexual participants were 199 college students (81 men and 108 women) who were students in a large human sexuality class and in an introductory psychology class at California State University, Fullerton. This sample was ethnically diverse, with 38% labeling themselves as White, 26% as Hispanic,

24% as Asian, and the remainder falling into other categories. The median age of the heterosexual sample was 22. Measures and procedures were the same as described in Study 2.

RESULTS

Computation and Reliability of Measures of Gender-Related Traits

Gender diagnostic probabilities were computed as in Study 2. Because of the large number of gay and lesbian participants in the total sample, the heterosexual sample was multiplied (this time by a factor of 10) when computing gender diagnostic probabilities. In all other analyses, the original sample is used. Over all participants in the original sample, the reliabilities of GD probabilities were .92 for occupations and .87 for hobbies. For men, corresponding reliabilities were .91 and .84, and for women .93 and .88.

PAQ I and E were computed as in Studies 1 and 2; their reliabilities were respectively .77 and .84. Self-ascribed masculinity and femininity scores were computed as before. The reliabilities of self-ascribed masculinity were .90 for men and .92 for women, and the reliabilities of self-ascribed femininity were .90 for men and .96 for women. Self-ascribed masculinity and femininity correlated –.45 ($p < .001$) for men and –.83 ($p < .001$) for women.

Comparing Sexual Orientation Groups on Gender-Related Traits

Analyses are like those presented for Study 2. Table 6 presents mean scores of gay men and heterosexual men on gender-related traits. Consistent with the results of Studies 1 and 2, Table 6 shows that GD measures displayed the strongest differences between gay men and heterosexual men (effect sizes of 1.76 and 1.97). Gay men were considerably more female-typical in their occupational and hobby preferences than were heterosexual men. Self-ascribed femininity and masculinity also showed moderate and significant differences, with gay men describing themselves as more feminine and less masculine than heterosexual men. Finally, I and E showed modest links to sexual orientation, with gay men scoring significantly lower on instrumentality and marginally higher on expressiveness than heterosexual men.

Table 6

Means and Standard Deviations of Gay and Heterosexual Men on Gender-Related Traits, and Effect Sizes for Differences Between Groups (Study 3)

	Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Means (*SD*s) for Gay Men (n = 90)	.42 (.19)	.42 (.17)	3.55 (.62)	4.01 (.56)	3.31 (.78)	2.36 (.82)
Means (*SD*s) for Heterosexual Men (n = 81)	.69 (.11)	.71 (.11)	3.76 (.54)	3.86 (.51)	3.92 (.62)	1.87 (.76)
Effect Sizes for Differences Between Groups	–1.76***	–1.97***	–.36*	.28[m]	–.86***	.62***

Note. Effect sizes are positive when gay men are higher than heterosexual men, and negative when heterosexual men are higher than gay men. Higher GD scores are more male-typical.

[m] two-tailed p = .07

* two-tailed $p < .05$

** two-tailed $p < .01$

*** two-tailed $p < .001$

Table 7 presents results for women. It indicates that GD measures again showed strong differences between lesbian and heterosexual women. Lesbian women were much more male-typical in their occupational and hobby preferences than were heterosexual women (effect sizes of 1.70 and 1.67). Self-ascribed femininity and masculinity also showed large differences, with lesbian women reporting that they were less feminine and more masculine than heterosexual women. E was the only PAQ scale to show a difference between groups, with lesbian women scoring moderately lower on expressiveness than heterosexual women.

As in Study 2, it was possible to compute "gay-heterosexual diagnosticity" measures for men and "lesbian-heterosexual" diagnosticity measures for women. The method of computation was as described in Study 2. The reliability of "gay-heterosexual diagnosticity" based on occupational preferences was .91, and the reliability of "gay-heterosexual diagnosticity" based on hobby preferences was .89. Similarly, the reliability of "lesbian-heterosexual diagnosticity" based on occupational preferences was .93, and for "lesbian-heterosexual diagnosticity" based on hobby preferences, .88.

Once again, "gay-heterosexual diagnosticity" measures successfully distinguished gay men from heterosexual men. Men with "gay-heterosexual diagnosticity" scores of greater than .5 were predicted to be gay, and men with scores less than or equal to .5 were predicted to be heterosexual. By this classification criterion, 91% of men (76 of 81 heterosexual men, and 79 of 90 gay men) were correctly classified as to sexual orientation based on occupational preferences, and 94% of men (76 of 80 heterosexual men, and 84 of 90 gay men) were correctly classified based on hobby preferences. Women with "lesbian-heterosexual diagnosticity" scores of greater than .5 were predicted to be lesbian, and women with scores less than or equal to .5 were predicted to be heterosexual. Using this classification criterion, 87% of women (100 of 107 heterosexual women, and 65 of 82 lesbian women) were correctly classified based on occupational preferences, and 84% of women (98 of 108 heterosexual women, and 61 of 82 lesbian women) were correctly classified based on hobby preferences.

Table 8 presents the correlations of men's "gay-heterosexual diagnosticity" scores and women's "lesbian-heterosexual diagnosticity" scores with their assessed gender-related traits. As this table shows, "gay-heterosexual diagnosticity" correlated very strongly with GD measures and self-ascribed femininity, and less strongly, but still significantly, with

Table 7

Means and Standard Deviations of Lesbian and Heterosexual Women on Gender-Related Traits and Effect Sizes for Differences Between Groups (Study 3)

	Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Means (*SD*s) for Lesbian Women (n = 82)	.62 (.24)	.60 (.24)	3.80 (.68)	3.76 (.84)	3.03 (1.00)	2.69 (1.04)
Means (*SD*s) for Heterosexual Women (n = 107–108)	.32 (.13)	.31 (.12)	3.67 (.50)	4.17 (.45)	1.83 (.75)	4.26 (.71)
Effect Sizes for Difference Between Groups	1.70***	1.67***	.22	–.65***	1.40***	–1.86***

Note. Effect sizes are positive when lesbian women are higher than heterosexual women, and negative when heterosexual women are higher than lesbian women. Higher GD scores are more male-typical.

* $p < .05$

** $p < .01$

*** $p < .001$

Table 8
Correlations Between Homosexual-Heterosexual Diagnosticity Measures and Gender-Related Traits, for Men and Women (Study 3)

	Correlations for Men Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Gay-Heterosexual Diagnosticity (Occupations) (n = 240–244)	–.90***	–.83***	–.25**	.10	–.49***	.39***
Gay-Heterosexual Diagnosticity (Hobbies) (n = 240–244)	–.72***	–.86***	–.24***	.09***	–.41	.33***
	Correlations for Women Gender-Related Traits					
	GD Occupations	GD Hobbies	PAQ I	PAQ E	Self-Ascribed Masculinity	Self-Ascribed Femininity
Lesbian-Heterosexual Diagnosticity (Occupations) (n = 277–281)	.94***	.81***	.28***	–.46***	.69***	–.76***
Lesbian-Heterosexual Diagnosticity (Hobbies) (n = 276–280)	.84***	.90***	.22**	–.53***	.73***	–.79***

Note. GD measures are scored with higher scores more male-typical. Homosexual-heterosexual diagnosticity measures are scored with higher scores more homosexual-typical. ** two-tailed $p < .01$; *** two-tailed $p < .001$.

I, E, and self-ascribed masculinity. For women, "lesbian-heterosexual diagnosticty" correlated most strongly with GD measures.

Again, the correlations between "homosexual-heterosexual diagnosticity" and GD measures were virtually as high as possible, given the reliability of measures. When corrected for attenuation due to unreliability, the correlation between "gay-heterosexual diagnosticity" and GD based on occupational preferences was .94, and the correlation between "gay-heterosexual diagnosticity" and GD based on hobby preferences was 1. For women, the correlations between "lesbian-heterosexual diagnosticity" and GD based on occupational preferences and between "lesbian-heterosexual diagnosticity" and GD based on hobby preferences both corrected to 1.

DISCUSSION OF STUDY 3

Study 3 replicated the main results of Studies 1 and 2. Gay men differed from heterosexual men most strongly on GD measures, but also strongly on self-ascribed masculinity and femininity. Lesbian women differed from heterosexual women most strongly on GD and on self- ascribed masculinity and femininity. Like Study 2, Study 3 demonstrated that reliable "gay-heterosexual diagnosticity" measures could be computed for men, and similarly, reliable "lesbian-heterosexual diagnosticity" measures could be computed for women, based on participants' occupational and hobby preferences. These "homosexual-heterosexual diagnosticity" measures correlated very strongly with GD measures.

GENERAL DISCUSSION

The current research demonstrated that the relationships between sexual orientation and GD measures were consistently very strong. The relationships between sexual orientation and self-ascribed masculinity and femininity tended to be somewhat weaker, but still frequently strong and significant. Finally, the relationships between sexual orientation and I and E were weaker still, but at times significant.

The findings reported in Studies 2 and 3 on "homosexual-heterosexual diagnosticity" measures underscore the linkage between sexual orientation and gender-related occupational and hobby preferences. The degree to which men's occupational and hobby preferences are gay- versus heterosexual-typical correlated almost perfectly with the degree to which

those same preferences are female- versus male-typical. Similarly, the degree to which women's occupational and hobby preferences are lesbian- versus heterosexual-typical correlates almost perfectly with the degree to which those same preferences are male- versus female-typical. In other words, for men, gay-typical interests tend to be also female-typical, and for women, lesbian-typical interests tend to be also male-typical.

It is important to note that these results *do not* imply that gay men are "like women" or that lesbian women are "like men." Rather, the mean GD scores presented in Studies 1, 2, and 3 suggest that gay men and lesbian women are intermediate between heterosexual men and women. That is, gay men are more like women than heterosexual men, but they are not "like women," and lesbian women are more like men than heterosexual women, but they are not "like men." Furthermore, it is important to note that the mean scores presented in Studies 1, 2, and 3 are just that—*mean* scores. For all individual difference measures, there was considerable variation within sexual orientation groups, as well as significant differences between groups.

It seems likely that gay men receive much the same gender socialization (from family, peers, and mass media) as do heterosexual men, and, similarly, that lesbian women receive much the same gender socialization as do heterosexual women. From this perspective, the very large GD differences between gay and heterosexual men and between lesbian and heterosexual women are all the more noteworthy. Perhaps one reason why gays and lesbians are intermediate between heterosexual men and women on GD measures is that the male- versus female-typicality of their occupational/hobby preferences represents a compromise between their gender-atypical dispositions and the countervailing force of gender socialization. When viewed from this perspective, the study of gender-related behaviors in homosexual and heterosexual groups provides a unique opportunity to tease apart the conjoint (and sometimes opposing) influences of gender-related dispositions and gender socialization. The current research shows that, despite the putative strong "press" of gender socialization from parents, peers, and mass media, gender-related traits and behaviors still vary substantially within each sex.

A number of gender theorists have recently considered the question: How much do gender-related behaviors and dispositions from various domains cohere? The prevailing consensus is that gender-related traits and behaviors are "multifactorial" (Spence, 1993; Spence & Buckner, 1995), situationally variable, and, at best, weakly interrelated (Deaux &

LaFrance, 1998). The current results contradict this consensus, however, at least for the gender-related domains of sexual orientation and interests.

What are the implications of the current findings for theories of sex typing and sexual orientation? As noted at the start, biological theories would seem to imply stronger links between sexual orientation and sex-typed behaviors than do psychosocial theories. Thus, the very strong links documented here between adults' sexual orientation and their gender-related occupational and hobby preferences seem more consistent with biological theories than with psychosocial theories. At the very least, psychosocial theories are presented with an empirical challenge—how to explain the very "strong glue" binding sexual orientation with gender-related occupational and hobby preferences. Many of the effect sizes documented for GD in this article were extremely large, often ranging between 1 and 2, and computed correlations between "homosexual-heterosexual diagnosticity" and GD measures approached unity. Such robust effects provide an empirical challenge to *all* theories of sexual orientation and sex typing, as well as a unique opportunity to test competing theoretical formulations. The current findings, therefore, are interesting not only in their own right but also because they point to a domain of empirical investigation that promises to increase our theoretical understanding of both sex typing and sexual orientation.

REFERENCES

Bailey, J. M. (1995). Biological perspectives on sexual orientation. In A. R. D'Augelli & C. J. Patterson (Eds.), *Lesbian, gay, and bisexual identities over the lifespan: Psychological perspectives*. New York: Oxford University Press.

Bailey, J. M., Finkel, E., Blackwelder, K., & Bailey, T. (1996). *Masculinity, femininity, and sexual orientation.* Unpublished manuscript, Northwestern University.

Bailey, J. M., & Zucker, K. J. (1995). Childhood sex-typed behavior and sexual orientation: A conceptual analysis and quantitative review. *Developmental Psychology,* **31,** 43–55.

Bem, D. J. (1996). Exotic becomes erotic: A developmental theory of sexual orientation. *Psychological Review,* **103,** 320–335.

Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, **42,** 165–172.

Bem, S. L. (1981). *Bem Sex-Role Inventory professional manual*. Palo Alto, CA: Consulting Psychologists Press.

Deaux, K., & LaFrance, M. (1998). Gender. In D. T. Gilbert, S. T. Fiske, & G. Lindsey (Eds.), *The handbook of social psychology* (4th ed., Vol. 1, pp. 788–827). Boston: McGraw-Hill.

Diamond, M. (1993). Homosexuality and bisexuality in different populations. *Archives of Sexual Behavior,* **22,** 291–310.

Ellis, L. (1996a). Theories of homosexuality. In R. C. Savin-Williams & K. M. Cohen (Eds.), *The lives of lesbians, gays, and bisexuals: Children to adults* (pp. 11–34). Fort Worth, TX: Harcourt Brace.

Ellis, L. (1996b). The role of perinatal factors in determining sexual orientation. In R. C. Savin-Williams & K. M. Cohen (Eds.), *The lives of lesbians, gays, and bisexuals: Children to adults* (pp. 35–69). Fort Worth, TX: Harcourt Brace.

Haslam, N. (1997). Evidence that male sexual orientation is a matter of degree. *Journal of Personality and Social Psychology,* **73,** 862–870.

Kagan, J. (1964). Acquisition and significance of sex typing and sex-role identity. In M. L. Hoffman & L. W. Hoffman (Eds.), *Review of child development research* (Vol. 1, pp. 137–167). New York: Russell Sage Foundation.

Kite, M. E., & Deaux, K. (1984). Gender belief systems: Homosexuality and the implicit inversion theory. *Psychology of Women Quarterly,* **11,** 83–96.

Kohlberg, L. (1966). A cognitive-developmental analysis of children's sex role concepts and attitudes. In E. E. Maccoby (Ed.), *The development of sex differences.* Stanford, CA: Stanford University Press.

Laumann, E. O., Gagnon, J. H., Michael, R. T., & Michaels, S. (1994). *The social organization of sexuality: Sexual practices in the United States*. Chicago: The University of Chicago Press.

Lippa, R. (1991). Some psychometric characteristics of gender diagnosticity measures: Reliability, validity, consistency across domains and relationship to the Big Five. *Journal of Personality and Social Psychology*, **61,** 1000–1011.

Lippa, R. (1995). Gender-related individual differences and psychological adjustment in terms of the Big Five and circumplex models. *Journal of Personality and Social Psychology,* **69,** 1184–1202.

Lippa, R. A. (in press). On deconstructing and reconstructing masculinity-femininity. *Journal of Research in Personality.*

Lippa, R., & Arad, S. (1997). The structure of sexual orientation and its relation to masculinity, femininity, and gender diagnosticity: Different for men and women. *Sex Roles,* **37,** 187–208.

Lippa, R., & Connelly, S. C. (1990). Gender diagnosticity: A new Bayesian approach to gender-related individual differences. *Journal of Personality and Social Psychology*, **59,** 1051–1065.

Meyer-Bahlbur, H. (1984). Psychoendocrine research on sexual orientation: Current status and future options. *Progress in Brain Research,* **61,** 375–398.

Pillard, R. C. (1991). Masculinity and femininity in homosexuality: "Inversion" revisited. In J. C. Gonsiorek & J. D. Weinrich (Eds.), *Homosexuality: Research implications for public policy* (pp. 32–43). Newbury Park, CA: Sage.

Spence. J. T. (1993). Gender-related traits and gender ideology: Evidence for a multifactorial theory. *Journal of Personality and Social Psychology,* **64,** 624–635.

Spence, J. T., & Buckner, C. (1995). Masculinity and femininity: Defining the undefinable. In P. J. Kalbfleisch & M. J. Cody (Eds.), *Gender, power, and communication in human relationships* (pp. 105–138). Hillsdale, NJ: Erlbaum.

Spence, J. T., & Helmreich, R. L. (1978). *Masculinity and femininity: Their psychological dimensions, correlates, and antecedents*. Austin, TX: University of Texas Press.

Spence, J. T., Helmreich, R. L., & Stapp, J. (1974). The Personal Attributes Questionnaire: A measure of sex role stereotypes and masculinity-femininity. *JSAS*, Catalog of Selected Documents in Psychology, **4,** 43–44 (MS. No. 617).

Storms, M. D. (1979). Sex role identity and its relationship to sex role attributions and sex role stereotypes. *Journal of Personality and Social Psychology,* **37,** 1779–1789.

Terman, L. M., & Miles, C. C. (1936). *Sex and personality: Studies in masculinity and femininity.* New York: Russell & Russell.