Accuracy of Judgments of Sexual Orientation From Thin Slices of Behavior

Nalini Ambady
Harvard University

Mark Hallahan
Clemson University

Brett Conner
Harvard University

In this research the authors examined the accuracy of judging sexual orientation on the basis of brief observations or "thin slices" of nonverbal behavior. In Study 1, sexual orientation was judged more accurately than chance, with judgments being more accurate when based on dynamic nonverbal behavior (10-s and 1-s silent video segments) than on static information (a series of 8 still photographs). Gay men and lesbians were more accurate than heterosexuals in judging still photographs and 1-s clips but not in 10-s clips. In Study 2, judgments based on 10-s dynamic figural outline displays containing primarily gestural information were more accurate than chance.

There are conflicting beliefs about the extent to which sexual orientation can be perceived from observations of behavior. Much of the current literature assumes that sexual orientation is a concealable aspect of social identity (e.g., Frable, Blackstone, & Scherbaum, 1990; Frable, Platt, & Hoey, 1998; Herek & Capitanio, 1996), as does the idea that gay men and lesbians can "pass," or effectively hide their orientation (Goffman, 1963). Moreover, controversial "don't ask, don't tell" policies assume that sexual orientation is evident only when there is a conscious decision to reveal it. However, in apparent contradiction of the belief that sexual orientation is imperceptible, in surveys of gay men and lesbians, a substantial proportion of respondents reported believing that they could judge sexual orientation accurately from brief observations of behavior (Sahgir & Robins, 1973; Westwood, 1960). Neither current theory nor existing empirical research offers much help to resolve this matter. Clearly, sexual orientation is not completely transparent to observers, as evidenced by numerous examples of people who do conceal their orientation successfully. Beyond that, not much is known about the extent to which perceivers can accurately judge sexual orientation—a judgment that may have important social consequences.

Accuracy From Thin Slices of Behavior

Although there has been very little research about the extent to which people can perceive sexual orientation, extensive evidence suggests that for a wide variety of other judgments, people are impressively accurate even when given quite minimal information. Basic human characteristics such as age and gender can be perceived from substantially degraded information (Cutting & Proffitt, 1981; Johannson, 1973, 1975; Mather & West, 1993; Shiffrar, Lichtey, & Chaterjee, 1997). For example, moving point-light displays (small patches of lights attached to the joints) of only 200 ms provide sufficient information for naive viewers to identify the locomotion of animals, types of human actions (such as push-ups or jumping jacks), and the gender of walkers (Cutting, 1978; Cutting & Kozlowski, 1977; Kozlowski & Cutting, 1977; Runeson & Frykholm, 1983). In the zero-acquaintance paradigm, people accurately judge personality traits such as extroversion on the basis of extremely brief interactions with complete strangers (Albright, Kenny, & Malloy, 1988; Ambady, Hallahan, & Rosenthal, 1995; Funder, 1995; Kenny, 1994; Kenny, Horner, Kashy, & Chu, 1992; Norman & Goldberg, 1966; Zebrowitz & Collins, 1997). Interpersonal and relational variables such as status, kinship, and deception can be inferred at better than chance levels from brief video clips (Costanzo & Archer, 1989). In addition, judgments of important social and clinical outcomes, such as teacher effectiveness (Ambady & Rosenthal, 1993), interpersonal expectancies (Rosenthal & Rubin, 1978), and mental patient pathology (Waxer, 1976 1977), can be made accurately from brief observations of behavior. In a meta-analytic summary of 38 studies, Ambady and Rosenthal (1992) found a surprisingly high level of predictive accuracy for various outcomes (average effect size $r = .39$) based on brief observations, or "thin slices," of behavior (observations ranged from 3.5 s to 300 s).

In ecological and functional theories perceptual accuracy is viewed in terms of its adaptive value for perceivers (Gibson, 1979; McArthur & Baron, 1983; Zebrowitz & Collins, 1997). It is

thought that characteristics relevant to taking adaptive action, such as another person's age, gender, and levels of social dominance and hostility, are likely to be perceived quickly and accurately. For example, the ability to perceive emotions such as anger and fear might facilitate an effective response to a threatening situation, such as helping people diffuse or avoid potentially combustible interactions. Similarly, the ability to perceive variables related to sexuality, such as gender and sexual orientation, may also facilitate adaptive behavior; accurately perceiving such attributes could be helpful for identifying available and receptive romantic partners.

Judging Sexuality and Sexual Orientation

Indeed, there is evidence that people are able to perceive a number of variables related to gender identity and sexuality on the basis of sparse information. For example, psychological masculinity and femininity can be perceived from biological motion displays. In a study using point-light displays, the gaits of sex-typed individuals (men who self-rated high on attributes related to cultural definitions of masculinity and women who self-rated high on culturally feminine attributes) were judged to be more masculine and more feminine, respectively, than androgynous and non-sex-typed men and women (Frable, 1987). People also accurately judged males' sociosexuality, or their willingness to engage in sexual relations without closeness or commitment, on the basis of observations of 60-s video clips (Gangestad, Simpson, Di-Geronimo, & Biek, 1992).

There is some evidence, although it is not unequivocal, that sexual orientation and variables related to sexual orientation can be judged accurately from minimal information. In two studies researchers have examined the relationship between sexual orientation and judgments based on vocal cues. In one study, although direct judgments of sexual orientation were not obtained, lesbians were judged to have more masculine speech than heterosexual women and gay men were judged to have more feminine speech than heterosexual men on the basis of brief speech samples consisting of a single paragraph read aloud and 30 s of spontaneous speech (Travis, 1981). In another study, men's sexual orientation was judged quite accurately (80% correct identifications) on the basis of 90-s excerpts from a spoken monologue, albeit with a very small sample of speakers: 5 gay men and 4 heterosexual men (Linville, 1998). In a third study, in which both visual and vocal cues were used (2- to 3-min video clips with sound), it was concluded that sexual orientation could be judged "no better than at chance levels" (Berger, Hank, Rauzi, & Simkins, 1987, p. 86). A closer look at their data, however, suggests that there is some evidence for accuracy. The average level of accuracy in this study was above chance (56%, with chance being 50%), and 20% of the participants were accurate in at least two thirds of their judgments when only 8% would have been expected to have done so well by chance. A conservative analytic strategy and low statistical power made it unlikely that this study would have yielded statistically significant results even if judges' accuracy was above chance.[1]

One objective of the current research was to investigate whether sexual orientation could be perceived accurately from brief observations of silent video clips, which contain no vocal information. This would extend the intriguing, but still inconclusive, existing evidence regarding the accuracy of judging sexual orientation. Examining judgments based on brief observations of nonvocal, nonverbal behavior will help to establish whether the accuracy of

judging sexual orientation is a reliable phenomenon and to clarify how information about sexual orientation is conveyed to observers. On the one hand, findings that sexual orientation cannot be judged accurately on the basis of nonvocal, nonverbal cues would suggest that the accuracy observed in previous research might likely be due to information conveyed particularly through vocal channels. On the other hand, findings that sexual orientation can be judged accurately on the basis of nonvocal, nonverbal cues would augment the existing evidence that sexual orientation is not completely concealable, as well as indicate that nonvocal communication channels may convey important information about sexual orientation.

Silent video clips may yield accurate judgments for two reasons. Video clips convey information regarding static aspects of appearance such as hairstyle, clothing, jewelry, and body shape. Silent video clips also convey information regarding dynamic behaviors such as movement and gesture. Our second objective was to compare the accuracy of judgments based on silent video clips with the accuracy of judgments based on still photographs extracted from those video clips, which show the same static information with no movement. Although it is possible that some information about sexual orientation may be conveyed in static aspects of appearance, such as hairstyles or clothing, previous research indicates that dynamic cues yield relatively more accurate judgments for other types of perceptual variables (Barclay, Cutting, & Kozlowski, 1978; McArthur & Baron, 1983; Valenti & Costall, 1997).

Individual Differences: Judges and Targets

An additional aim of this research was to investigate variables that predict individual differences in the ability to judge sexual orientation. Specifically, variables such as the judges' gender and sexual orientation and targets' gender were examined.

Judges' Sexual Orientation

Particularly among gay men, there exists a belief that they have an advantage in judging sexual orientation. In one survey, 67% of gay men characterized their ability to recognize that another man was gay as being at least "more likely . . . than the ordinary man" (Westwood, 1960, p. 83), whereas only 34% reported to believe that their orientation was recognized by people other than gay men. In another survey, 71% of gay men reported they believed they

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[1] In the analyses targets ($n = 24$) were assumed to be random, and they did not aggregate across judges. With similar data, researchers often aggregate judges' ratings, which results in larger effect sizes and greater statistical power. It also would be possible to analyze these data assuming the judges ($N = 143$) to be random, which would have resulted in a much lower p value, $t(139) = 8.34$, $p < .0001$ (see Hallahan, 1998, for reanalysis of these data). The analyses presented in Berger et al. (1987) also had low statistical power. With only 24 targets, power $= 0.15$ for an effect of the size that was observed (accuracy $r = .126$), assuming $\alpha = .05$, one-tailed. In other words, an individual judge with an actual accuracy correlation of .126 (i.e., whose long-term average $= 56\%$ correct) would make enough correct judgments to be statistically significant for a sample of 24 targets only 15% of the time. Power still would be quite low for larger effects. For example, power $= 0.42$ for $r = .30$; $r = .30$ is considered a typical medium-size effect (Cohen, 1988) and would correspond to approximately 65% correct here.

could reliably recognize other gay men "from the first casual encounter" (Sahgir & Robins, 1973, p. 78). Many lesbians also report they believe they can recognize other lesbians from a casual encounter, although not nearly as frequently as gay men (e.g., 44% in Sahgir & Robins, 1973). We know of no existing research examining heterosexuals' beliefs about whether they can identify a person's sexual orientation. Of course, the mere fact that gay men and lesbians believe they can accurately perceive sexual orientation does not necessarily imply the belief is valid, although there is some evidence indicating their superiority over heterosexual men and women in this arena (Berger et al., 1987), $F(1, 139) = 8.68$, $p = .004$, $r = .24$.[2] Our third objective, therefore, was to garner more evidence so we might assess whether gay men and lesbians judge sexual orientation more accurately than do heterosexuals.

Existing theory provides little basis to explain why gay men and lesbians might possibly have an advantage in perceiving sexual orientation. One possibility is that the ability to judge sexual orientation accurately may be functionally important for gay men and lesbians because of their status as a numerical minority who often experience prejudice and discrimination. Because of their low frequency in the general population (estimates range from 1% to 10%), the ability to recognize those who share their sexual orientation may be consequential for gay men and lesbians in identifying potential romantic partners and in minimizing romantic rejection. Presumably, this accuracy is much less important for heterosexuals seeking romantic partners, because over 90% of the people they encounter share their orientation. Further, because of antigay prejudice, inaccuracy may effect greater costs for gay men and lesbians, such as the risk of homophobic hostility and violence. Some gay men and lesbians also may have an advantage in judging sexual orientation because they have greater opportunity to interact with people they know to be gay or lesbian. This experience may be associated with greater awareness of the characteristics that differentiate gay men and lesbians from their heterosexual counterparts.

Gay men and lesbians, as members of socially stigmatized, or marginal, groups, often need to carefully manage their public identities in the face of antigay prejudice. In part, identity management involves paying particularly close attention to their social environment and to the behavior of their interaction partners (Frable et al., 1990). In addition to having a generally heightened awareness of the people and things around them, members of socially stigmatized groups might be particularly sensitive to the subtle cues distinctive of their own specific group. In his classic work on stigma, Goffman wrote that the "very techniques used to conceal stigmas might give the show away to someone who is familiar with the tricks of the trade, the assumption being that it takes one (or those close to him) to know one" (Goffman, 1963, p. 85). Thus, heightened sensitivity might be associated with greater accuracy.

Judges' Gender

Berger et al. (1987) found that women judged sexual orientation more accurately than men, $F(1, 139) = 4.89$, $p = .03$, $r = .18$.[3] This is not a surprising result given the wealth of existing evidence demonstrating that women are generally more accurate judges of nonverbal behavior than men, a finding that has been observed consistently across different age, cultural, and national groups

(e.g., Ekman, 1973; Hall, 1984; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979). Women's advantage typically extends to judgments based on very brief observations of behavior, such as judging gender from point-light displays (Barclay et al., 1978; Frable, 1987) and personality from brief interactions (Ambady et al., 1995). However, it would be premature to take the results of a single study (Berger et al., 1987) as proof that women judge sexual orientation more accurately than men. There are notable exceptions to women's general accuracy at judging nonverbal behavior. For example, women's advantage diminishes for detecting deception (Hurd & Noller, 1988; Noller, 1986) and for judgments based on less controllable channels of nonverbal behavior (Rosenthal & DePaulo, 1979). Our fourth objective was to compare the extent to which men and women accurately judge sexual orientation.

Targets' Gender

Our final objective was to examine whether male and female targets differ in how accurately their sexual orientation is judged. The nature of sexual orientation may be quite different for men and women (Risman & Schwartz, 1988). For example, it is argued by some that women's sexual orientation might be more likely than men's to be a matter of choice (e.g., Cass, 1990; Haldeman, 1994; Jeffreys, 1993; Kitzinger & Wilkinson, 1995; Rothblum, 1994), and researchers have cautioned that models that explain men's sexual orientation may not necessarily apply to women's sexual orientation (Chapman & Brannock, 1987). Therefore, it would be a mistake to assume that observers are similarly able to perceive men's and women's sexual orientation.

Previous work has shown that women tend to be judged more accurately than men on a wide range of variables. For example, women tend to be more expressive nonverbally (Hall, 1984; Knapp & Hall, 1992), to display greater facial expressiveness, to use more expressive hand gestures, and to express their emotions more accurately than men (Buck, 1984; Buck, Miller, & Caul, 1974; DePaulo, 1992; Hall, 1984). However, it is uncertain whether the general finding that women are judged more accurately will necessarily translate into similarly greater accuracy in judging their sexual orientation.

Study 1

Method

Overview

Judgments of individuals' (targets') sexual orientation were made on the basis of either a 10-s silent video clip, a 1-s silent video clip, or a series of eight still photographs. Judgments were made by heterosexual men and women, gay men, and lesbians (judges). Procedures for creating stimuli and obtaining judgments are described below.

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[2] This was not explicitly reported as such in Berger et al. (1987). A contrast for the main effect of judges' sexual orientation was computed using the reported condition means (heterosexual men = 12.70, gay men = 13.63, heterosexual women = 13.35, lesbians = 14.67) and the omnibus one-way analysis of variance, $F(3, 139) = 4.61$, $p < .004$. See Hallahan (1998) for more on the computation of these contrasts.

[3] This was not explicitly reported as such in Berger et al. (1987). See Hallahan (1998) for more on the computation of this contrast.

Phase 1: Creating Stimuli

Participants (targets). Twenty-five graduate students (5 heterosexual women, 5 lesbians, 7 heterosexual men, and 8 gay men) served as the targets (the people whose sexual orientation was being judged). Their ages ranged from 21 to 31 years ($M = 24.3$). Graduate students were used as targets to ensure a low probability that they would be known by the undergraduate judges (the people making the ratings of sexual orientation). Gay men and lesbian targets were recruited from meetings of graduate student gay and lesbian groups, and heterosexual targets were recruited from meetings of public service organizations. At this time, prospective targets were not aware that they were being solicited for research investigating sexual orientation; they were told the study was designed to examine the personality characteristics of graduate students who participate in extracurricular activities.

Procedure. In the laboratory, 27 prospective targets completed a bogus 20-item personality inventory that contained 19 filler items (such as questions about anxiety, alcohol consumption, and religiosity) and 1 item to measure prospective targets' sexual orientation: Item G read, "I have homosexual tendencies." Prospective targets rated these items on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*) as to how well each item described them. This method approximates the one used by Kinsey to measure sexual orientation (Kinsey, Pomeroy, & Martin, 1948). The Kinsey scale is a continuum of sexual behavior ranging from 0 (*exclusively heterosexual*) to 6 (*exclusively homosexual*) and has been the standard measure of sexual orientation since its inception. With the exception of one woman who rated herself 4, prospective targets used the extreme ends of the scale to classify their sexual orientation (of the men, 6 rated themselves 1s, 1 rated himself 2, and 8 rated themselves 7s; of the women, 3 rated themselves 1s, 2 rated themselves 2s, 1 rated herself 4, 2 rated themselves 6s and 2 rated themselves 7s).

After completing the surveys, targets were videotaped while responding to the following prompt: "Please discuss how you balance your extracurricular and academic activities." They were asked to speak for 1 min and to respond freely, although they were requested not to mention the school they attended, the specific campus group with which they were involved, or the work they did for that group. Targets were given as much time as they needed to prepare their statement. After finishing their statements, they were paid for their participation, debriefed, and informed about the purpose of the study and what would be done with their videotapes. All targets were given the option of dropping out of the study immediately and having their tape erased. Two targets requested this option.

Creating stimulus tapes. A silent 10-s video clip was created for each of the 25 participating targets by extracting the 25th through the 35th second of their videotaped discussions. The extracted clip did not include sound. These video clips showed the targets sitting on a wooden chair against a plain white background. Nearly the entire body, from the head down to the lower leg, was visible in these clips. Two master tapes were constructed. One tape contained the 25 clips assembled in a random order, and the second, made for the purpose of counterbalancing, contained the same clips in the reverse order. Silent 1-s clips were extracted from the middle of the 10-s clip (between the 4th and 6th second). Eight still photographs were created by freezing frames every 700 ms from the middle 5 s of the 10-s clip.

Phase 2: Judging Sexual Orientation

Participants (judges). Ninety-six undergraduates (24 heterosexual women, 24 lesbians, 24 heterosexual men, and 24 gay men) served as judges. They were recruited from undergraduate residence halls as well as from various undergraduate organizations, including gay and lesbian organizations. Judges rated their own sexual orientation on the same 7-point scale used by the targets. Judges who rated themselves 1–3 were considered heterosexual, and judges who rated themselves 4–7 were considered gay or lesbian. Judges were paid for their participation.

Procedure. Thirty-two judges were assigned to view targets in each of the three conditions (10-s silent video, 1-s silent video, eight still photos). Within conditions judges were fully balanced with regard to their gender and sexual orientation; that is, there were 8 heterosexual women, 8 lesbians, 8 heterosexual men, and 8 gay men making ratings in each condition. Half the judges in each condition saw the clips in the reverse order. Judges rated on a 7-point scale the extent to which they thought each target they saw was homosexual and the extent to which they thought each target they saw was heterosexual. Judges were asked whether they recognized any of targets, and none reported that they did.

Results and Discussion

There was a strong negative correlation between judges' ratings of homosexuality and heterosexuality (for still photos, median $r = -.91$; for 1-s clips, median $r = -.86$; for 10-s clips, median $r = -.99$). Therefore, a composite variable was created that combined these two ratings after reverse scoring the heterosexuality rating.

Judging Sexual Orientation

Can people make accurate judgments of sexual orientation? The first analysis treated the targets ($N = 25$) as random, which allows these findings to be generalized to other samples of targets. Within each condition, the correlation between targets' self-rated sexual orientation and the average perceived sexual orientation ratings from the 32 judges in that condition was computed. Positive correlations were observed within each condition, reflecting the fact that gay men and lesbians were perceived to be "more gay" than their heterosexual counterparts: $r(23) = .823, p < .0001$, for the 10-s clips; $r(23) = .534$, $p = .007$, for the 1-s clips; and $r(23) = .333, p = .11$, for the still photos (note that for the still photos $r = .333$ represents a nontrivial degree of accuracy and that statistical power is relatively low for a correlation of this size in a sample with $N = 25$, power $= 0.38$).

A procedure for computing contrasts on correlated correlation coefficients (Meng, Rosenthal, & Rubin, 1992) was used to compare the accuracy levels that were based on dynamic cues (10-s and 1-s clips) and static cues (eight still photos).[4] Accuracy was significantly greater in the 10-s and 1-s clips conditions than in the still photo condition ($Z = 3.37, p = .00075$, two-tailed). Accuracy was also significantly greater in the 10-s clips condition than in the 1-s clips condition ($Z = 3.11, p = .0018$, two-tailed).

The accuracy of individual judges was also examined. For the 10-s clips, all (32/32) of the judges had greater than chance accuracy (i.e., $r > .00$), and the typical judge correctly classified approximately 70% of targets ($M = 70\%, Mdn = 72\%$).[5] For the 1-s clips, 97% (31/32) of the judges had greater than chance accuracy, and the typical judge correctly classified approximately 60% of targets ($M = 61\%, Mdn = 60\%$). For the still photos, 84%

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[4] Contrast weights of $+1$ were assigned to the 10-s and 1-s clips conditions, and contrast weights of -2 were assigned to the still photo condition.

[5] We considered ratings from 1 to 3 to be heterosexual and ratings from 4 to 7 to be gay or lesbian. On the basis of this dichotomous categorization, an accurate judgment was defined as a correspondence between a judge's rating of a target's sexual orientation and the target's self-rated categorization.

(27/32) of the judges had greater than chance accuracy, and the typical judge correctly classified approximately 55% of targets (M = 54%, Mdn = 56%).

On average, judges' perception of targets' sexual orientation corresponded with targets' actual sexual orientation at better than chance levels. However, there was substantial variability in the extent to which individual targets were accurately judged. The sexual orientation of some targets was perceived with near-perfect levels of accuracy, whereas the sexual orientation of other targets was misperceived by a substantial majority of judges. In the still photo condition, the level of accuracy with which individual targets were judged ranged from 22% to 81%; in the 1-s clips condition, individual target accuracy ranged from 25% to 97%; and in the 10-s clips condition, individual target accuracy ranged from 31% to 97%.

Judgments of sexual orientation were more accurate than random guesses, but of course this does not imply that individual judgments of sexual orientation will be accurate in every case. The most accurate individual judges in this study were correct in 80% of their judgments.

Individual Differences in Accuracy

The remaining analyses examined individual differences in the accuracy of judging sexual orientation. To measure accuracy, we treated the judges (N = 96) as random and, for each individual judge, computed the correlation between the judge's ratings of the targets' sexual orientation with the targets' self-rated sexual orientation. This correlation provides a measure for each individual judge of the extent to which that judge rated people who described themselves as heterosexual to be heterosexual and people who described themselves as homosexual to be homosexual. Fisher's z transformation of r was used for analyses involving this correlation.

Are gay men and lesbians more accurate at detecting sexual orientation? We compared the accuracy of gay and lesbian judges with that of heterosexual judges (see Table 1). Overall, gay men and lesbians did perceive sexual orientation more accurately, $F(1, 84)$ = 5.23, p = .02, r = .24. However, heterosexuals were slightly, although not significantly, more accurate at judging 10-s clips, $F(1, 28)$ = 0.25, p = .62, r = −.09. Gay and lesbians judges were more accurate for the 1-s clip, $F(1, 28)$ = 5.90, p = .02, r = .42, and for the still photo conditions, $F(1, 28)$ = 4.14, p = .05, r = .36. The pattern across the three channels suggests that gay men and lesbians' superiority in judging sexual orientation is relatively greater as information gets more sparse. A post hoc contrast for this pattern in the interaction of channel and judge

sexual orientation approached significance, $F(1, 84)$ = 3.43, p = .07, r = .20.[6]

Do women and men differ in their ability to judge sexual orientation accurately? In this study we did not find evidence of a strong gender difference in judgmental accuracy. Although female judges had a slightly higher overall average accuracy level (see Table 1), the size of this difference was small and not statistically significant, $F(1, 84)$ = 1.72, p = .19, r = .14. Similar trends were observed within the three conditions: for still photos, $F(1, 28)$ = 0.07, p = .80, r = .05; for 1-s clips, $F(1, 28)$ = 2.54, p = .12, r = .29; and for 10-s clips, $F(1, 28)$ = 0.23, p = .63, r = .09.

Overall, for the three conditions there was not a strong Judge Gender × Judge Sexual Orientation interaction. The size of lesbians' relative advantage over heterosexual women was somewhat larger than gay men's advantage over heterosexual men, although it was not statistically significant, $F(1, 84)$ = 1.12, p = .29, r = .11. This interaction was significant, however, in the 1-s clips condition, $F(1, 28)$ = 5.34, p = .03, r = .40. Here lesbians were much more accurate than heterosexual women, but gay and heterosexual men had nearly identical accuracy levels. Thus, the significant main effect of sexual orientation in the 1-s clips condition seems to have been driven largely by lesbians' superior accuracy. The Judge Gender × Judge Sexual Orientation interactions were much weaker in the 10-s clips and still photo conditions (Fs < 1).

Do male and female targets differ in how accurately their sexual orientation is judged? To compare how accurately the sexual orientations of men and women were judged, we separated the male and female targets and computed individual judge accuracy correlations separately by target gender. Thus, for each judge we obtained separate accuracy measures for male and female targets. Female targets were judged much more accurately than male targets overall, $F(1, 84)$ = 64.00, p < .001, r = .66 (see Table 2). This gender difference occurred more strongly in the still photo condition, $F(1, 28)$ = 42.57, p < .0001, r = .78, and the 1-s clips condition, $F(1, 28)$ = 52.28, p < .0001, r = .81, than in the 10-s clips condition, $F(1, 28)$ = 3.81, p = .06, r = .35. The pattern across the three channels suggests that the increase in accuracy from the still photos to 1-s to 10-s clips was relatively stronger for judgments of male targets than for judgments of female targets. An unplanned contrast for this pattern in the interaction of channel and target gender was significant, $F(1, 84)$ = 5.88, p = .017, r = .26.[7]

In addition to the planned analyses, it should be noted that the three-way interaction of judge gender, target gender, and channel approached significance, $F(2, 84)$ = 2.55, p = .08. This interaction reflects that judges seemed to perceive the sexual orientation of opposite-gender targets relatively more accurately on the basis of static information and that of same-gender targets relatively more accurately on the basis of dynamic cues. This trend was not predicted, and it is not clear if it can be interpreted in a concep-

Table 1

Sexual Orientation Judgment Accuracy (r) by Judge Gender, Judge Sexual Orientation, and Channel

	Channel			
Judge type	Stills	1-s clips	10-s clips	M
Heterosexual women	.10	.26	.55	.32
Lesbians	.23	.50	.51	.42
Heterosexual men	.08	.30	.51	.31
Gay men	.21	.31	.50	.35
M	.16	.35	.52	.35

[6] The following set of weights was used to express this contrast: Heterosexual still = −1, gay or lesbian still = +1, heterosexual 1-s clips = 0, gay or lesbian 1-s clips = 0, heterosexual 10-s clips = +1, gay or lesbian 10-s clips = −1.

[7] The following set of weights was used to express this contrast: male still = −1, female still = +1, male 1-s clips = 0, female 1-s clips = 0, male 10-s clips = +1, female 10-s clips = −1.

Table 2
Accuracy of Judgment (r) by Channel and Gender of Target

	Channel			
Target gender	Stills	1-s clips	10-s clips	*M*
Women (n = 10)	.44	.58	.63	.56
Men (n = 15)	.02	.23	.50	.26

tually meaningful way. No other interactions involving target gender were significant (*F*s ranged from 0.02 to 1.35).

In sum, the results of this study revealed that sexual orientation can be detected at better than chance levels of accuracy from brief observations of nonvocal, nonverbal behavior. Dynamic information (silent videotapes) resulted in much greater accuracy than static information (a series of still photos). In general, gay men and lesbians perceived sexual orientation more accurately than . did their heterosexual counterparts, but this trend did not occur consistently across channels. Gay men and lesbians were more accurate when their judgments were based on still photos, lesbians were more accurate when their judgments were based on 1-s clips, but there was little difference between the four groups in accuracy when judgments were based on 10-s clips. Women's sexual orientation was judged substantially more accurately than men's overall, but this gender difference was much stronger when judgments were based on static rather than on dynamic information.

In Study 1, accuracy was significantly greater in the 1-s and 10-s clips conditions, which contained both dynamic and static information, than in the still photo condition, which contained only static information. This finding strongly suggests that dynamic nonverbal behavior, such as body movement and gesture, conveys information about sexual orientation beyond what might be available through static aspects of appearance, such as clothing, hair, or jewelry.

Study 2

Study 2 was conducted to better understand the relative contribution of static and dynamic information to judgments of sexual orientation by examining the accuracy of judgments based on dynamic information unaccompanied by information regarding static cues. This was done by obtaining judgments of sexual orientation based on dynamic figural outlines, which are specially edited video clips that display black-and-white outline figures of the targets and digitally block their faces with a dark circle (Bernieri, Davis, Rosenthal, & Knee, 1994). Thus, the targets' motions and gestures were visible, whereas information about static cues such as hairstyle, clothing, and jewelry was obscured.

The research objectives of this study closely paralleled those addressed in Study 1. The first objective was to examine whether sexual orientation can be judged at better than chance levels from dynamic figural outline displays. Observing greater than chance accuracy levels based on figural outline displays would provide further evidence that dynamic behavior, such as motion and gesture, conveys information about sexual orientation.

The second objective was to examine whether gay men and lesbians differ from heterosexual men and women in their ability to judge sexual orientation. On the basis of the results of the first study as well as on previous research (Berger et al., 1987), it was

expected that gay men and lesbians would judge sexual orientation relatively more accurately than their heterosexual counterparts.

The third objective was to examine whether men and women differ in their ability to perceive sexual orientation accurately. Berger et al. (1987) and Study 1 provided evidence that women have a modest advantage over men in judging sexual orientation. Likewise, it was expected that women would judge sexual orientation more accurately than would men, although the size of this gender difference is not likely to be large.

The fourth objective of this study was to investigate whether men and women differ in the extent to which their sexual orientation can be judged accurately. Although women's sexual orientation was generally judged more accurately in Study 1, we expected that men's sexual orientation would be judged more accurately from figural outline displays. The rationale for this prediction is based on the Target Gender × Channel interaction that was observed in Study 1. The extent to which women were judged more accurately than men was greatest in the still photo condition, which contained only static information, and decreased progressively in the 1-s and 10-s clips conditions, which contained both static information and dynamic information. One possible interpretation of this pattern is that static information is relatively more informative about women's sexual orientation and dynamic information is relatively more informative about men's sexual orientation. If this is true, men should be judged more accurately than women on the basis of figural outlines, which contain dynamic but not static information.

Method

Participants

Targets. In Study 2 we used the same set of targets as in Study 1. However, 6 targets were dropped because they did not make any gestures or movements during their 10-s clip. Thus, 19 of the original 25 targets from Study 1 were used.

Judges. Sixteen judges (3 heterosexual women, 5 lesbians, 4 heterosexual men, and 4 gay men) were recruited by means of advertisements in community newspapers in the Boston area, including gay and lesbian newspapers. Judges rated their own sexual orientation on the same 7-point scale used by the targets. Judges who rated themselves 1–3 were considered heterosexual, and judges who rated themselves 4–7 were considered gay or lesbian. Judges were paid for their participation.

Stimuli. A special effects generator was used to create a dynamic figural outline for 19 of the 25 10-s silent video clips from Study 1. This resulted in a silent 10-s clip that displayed a black outline of a target against a white background. Then, using the same special effects generator, the face of the person was blocked (see Figure 1 for an illustration). Although the outlines contained enough information to reveal the targets' gender, there was not enough information to recognize the person. The clips retained gestural information but eliminated static information revealed in still pictures such as facial features, facial expressions, details of clothing, hairstyles, and jewelry.

Procedure

The procedure was the same as in Study 1. Judges rated the extent to which they thought each target was homosexual and the extent to which they thought each target was heterosexual on 7-point scales.

Results and Discussion

As in Study 1, judges' ratings of homosexuality and heterosexuality were strongly negatively correlated (median *r* = −.82).
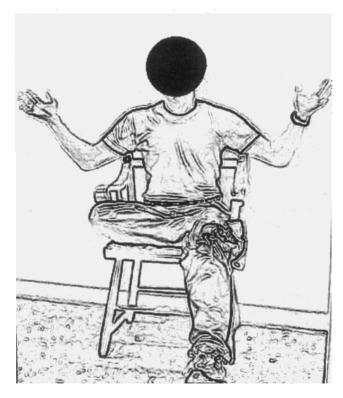
Figure 1. Sample still of a figural outline stimulus.

Therefore, the heterosexuality rating was reverse scored and combined with the homosexuality rating to form a single composite variable.

Judging Sexual Orientation

Similar to Study 1, an analysis that treated the targets ($n = 19$) as random was used to examine whether sexual orientation could be judged from dynamic figural outlines. There was a strong positive correlation between targets' self-rated sexual orientation and the average perceived sexual orientation ratings from the 16 judges who observed them, $r(17) = .48, p = .038$, suggesting that sexual orientation can be judged at greater than chance levels on the basis of dynamic figural outline displays.

We also examined how accurately individual judges perceived the targets' sexual orientation; 94% (15/16) of the judges had greater than chance accuracy (i.e., $r > .00$), and the typical judge correctly classified approximately 60% of the targets ($M = 60\%$, $Mdn = 58\%$). As in Study 1, accuracy was better than chance, but it was also far from perfect. Study 2's most accurate individual judge was correct in 74% of her judgments. There also was substantial variability in the extent to which individual targets were perceived accurately; individual target accuracy ranged from 13% to 94%.

Individual Differences in Accuracy

In the remaining analyses we examined individual differences in judges' accuracy of judging sexual orientation, using the same procedure as in Study 1. Judges ($N = 16$) were treated as random, and for each individual judge the correlation was computed be-

tween the judge's ratings of the targets' sexual orientation with the targets' self-rated sexual orientation. Fisher's z transformation of r was used for analyses involving this correlation.

Contrary to previous research, heterosexual men and women ($r = .31$) were slightly more accurate overall in their sexual orientation judgments than were gay men and lesbians ($r = .27$), but this difference was not statistically significant, $F(1, 12) = 0.41, p = .53, r = -.18$ (see Table 3). However, this finding was qualified by a strong and nearly significant Judge Gender × Judge Sexual Orientation interaction, $F(1, 12) = 2.95, p = .11, r = .44$. Although heterosexual men were more accurate than gay men, lesbians were slightly more accurate than heterosexual women (see Table 3). Consistent with the weak trend observed in previous research, lesbians' advantage over heterosexual women was again relatively greater than gay men's advantage over heterosexual men. Also, consistent with previous research, women ($r = .34$) were somewhat more accurate than men ($r = .24$), although this difference was not statistically significant, $F(1, 12) = 1.37, p = .26, r = .32$ (see Table 3).

As predicted, men's sexual orientation was judged more accurately ($r = .37$) than women's ($r = .10$). This difference approached significance, $F(1, 12) = 3.91, p = .07, r = .50$.

In sum, Study 2 revealed that motion and gesture play an important role in the judgment of sexual orientation from thin slices of behavior. Sexual orientation was judged accurately entirely on the basis of dynamic nonverbal behavior in which static information, such as targets' facial features, clothing, hairstyles, or jewelry, were obscured. In addition, the finding that male targets were judged more accurately on the basis of figural displays, which contain primarily dynamic information, is consistent with Study 1's finding suggesting that gestural, dynamic information may be relatively more useful for perceiving men's sexual orientation than it is for perceiving women's sexual orientation.

Quantitative Summary of Accuracy of Judgments of Sexual Orientation

Table 4 summarizes the current study as well as Berger et al. (1987) and Linville (1998), which, to our knowledge, consists of the only existing research that has focused on sexual orientation judgment accuracy. These three independent studies contained 58 targets and 280 judges all together. Judgments of sexual orientation were obtained from brief observations (ranging from 1 s to 180 s) in six different conditions that presented widely varied information to judges. Taken together, these studies provide credible evidence that sexual orientation can be judged accurately from brief observations of behavior. Accuracy levels were consistently above chance (i.e., >50% correct), and the average accuracy level

Table 3

Judgment Accuracy of Figural Outline (r) by Judge Gender and Sexual Orientation

Judge type	r
Heterosexual women	.29
Lesbians	.36
Heterosexual men	.33
Gay men	.15
M	.29

Table 4

Summary of Existing Research on Sexual Orientation Judgment Accuracy

Study	Target	Judge	Condition	Percentage correct			Judge effects		
				Men	Women	Total	r_{JO}	r_{JG}	r_{JO*JG}
Linville (1998)	9	25	90-s audio	.80		.80			
Berger et al. (1987)	24	143	2- to 3-min video with sound	.60	.52	.56	.24	.18	.04
Current research									
Study 1a	25	32	8 still photos	.49	.63	.54	.36	.05	.00
Study 1b	25	32	1-s silent video	.58	.65	.61	.42	.29	.40
Study 1c	25	32	10-s silent video	.70	.70	.70	−.09	.09	.08
Study 2	19	16	10-s figural outline displays	.62	.54	.60	−.18	.32	.44
Total	58[a]	280							
Unweighted M						.66[b]	.19[d]	.19[d]	.14[d]
Weighted M						.62[b,c]	.20[d,e]	.18[d,e]	.13[d,e]

Note. Target = number of targets; Judge = number of judges; r_{JO} = judge sexual orientation effect size (positive r = gay and lesbian judges more accurate); r_{JG} = judge gender effect size (positive r = female judges more accurate); r_{JO*JG} = Judge Sexual Orientation × Judge Gender interaction effect size (positive r = lesbians' advantage over heterosexual women is relatively greater than gay men's advantage over heterosexual men).
[a] The same 25 targets were used for every condition in the current research.
[b] The four conditions in this research are not independent because they used the same targets. Therefore, we first averaged the percentage correct across our four conditions (M = 61.3%) and then averaged this value with Linville (1998) and Berger et al. (1987) to obtain an overall average percentage correct for these three independent studies.
[c] Weighted by the number of targets in each study.
[d] We first averaged the judge sexual orientation, judge gender, and Judge Sexual Orientation × Judge Gender interaction effect sizes across the four conditions in the current study (average r_{JO} = .14, average r_{JG} = .19, average r_{JO*JG} = .24). These effect sizes were then averaged with Berger et al.'s (1987) effect sizes to obtain the overall average effect sizes for these two independent studies.
[e] Weighted by the number of judges in each study.

across the three studies exceeds 60% (average accuracy = 66%; weighted by the number of targets per study, average accuracy = 62%).

These results also provide information about the extent to which the ability to perceive sexual orientation differs as a function of judge gender and judge sexual orientation. Gay men and lesbians appear to be moderately more accurate overall in perceiving sexual orientation than are heterosexual men and women (average r_{JO} = .19, Z = 3.15, p = .002, two-tailed). Similarly, women appear to judge sexual orientation moderately more accurately than men (average r_{JG} = .19, Z = 2.74, p = .006, two-tailed). There is also some evidence suggesting that size of lesbians' advantage over heterosexual women is slightly larger than the size of gay men's advantage over heterosexual men (average r_{JO*JG} = .14, Z = 1.84, p = .06, two-tailed). However, it should be noted that the average observed effects are modest in size and that there is substantial variability in effect size across the different conditions.

General Discussion

In the current research we found that people accurately perceive sexual orientation from brief observations of behavior—as brief as 1-s silent video clips—and that dynamic nonverbal behavior conveys information about sexual orientation above and beyond what is available through static aspects of appearance such as clothing, jewelry, or hairstyle. The general consistency of this result with previous work (i.e., Berger et al., 1987; Linville, 1998) seems to suggest that accuracy at judging sexual orientation is a fairly robust phenomenon. Particularly impressive is the fact that this consistency occurred despite the considerable methodological variety in the existing studies. For example, judgments were based on observations of varied length and content. Clips ranged in length from 1 s (the current research) to 2–3 min (Berger et al., 1987) and

showed diverse information, including only audio (Linville, 1998), only visual (the current research), and audio and visual information together (Berger et al., 1987). In some studies, targets were videotaped unaware that their sexual orientation would be judged (the current research), whereas in others they were explicitly informed they were being taped for research involving judgments of sexual orientation (Berger et al., 1987).

However consistent, the amount of existing evidence about sexual orientation judgment accuracy is still relatively small. Although people apparently perceive sexual orientation at better than chance levels, more research is needed to identify potential boundaries and moderators of accuracy. For example, it would be useful to have more data to assess precisely which channels of communication yield the most accurate judgments.

There is some evidence that gay men and lesbians perceive sexual orientation more accurately than do heterosexuals and that women judge sexual orientation more accurately than do men. However, the overall size of these differences was not large, and there was considerable variability across different channels. For example, gay men and lesbians were significantly more accurate in Berger et al. (1987) and in the still photo and 1-s video clips conditions of the current study, but heterosexuals were actually slightly more accurate when their judgments were based on observations of 10-s video clips and figural outline displays. The existing research casts doubt on the idea that gay men have a particular advantage in judging sexual orientation (Sahgir & Robins, 1973). These data suggest that gay men and lesbians are similarly accurate; if anything, lesbians' advantage over heterosexual women is relatively greater than gay men's advantage over heterosexual men.

In general, the sexual orientation of women was judged more accurately than that of men. However, this gender difference was

qualified by the information available to judges. The extent to which women were judged more accurately than men was greatest when the judgments were based on still photos, which do not show dynamic nonverbal behavior. When dynamic behavior was present, in the 1-s and 10-s clips, the sexual orientation of women was still judged more accurately, but the relative size of this gender difference decreased substantially from the still photo condition. In contrast, in the figural outline condition, when only gestural information was present, men's sexual orientation was judged somewhat more accurately than that of women. These results suggest that static aspects of appearance such as hairstyle, clothing, and jewelry may be relatively more informative about women's sexual orientation, and dynamic nonverbal behavior such as gestures may be relatively more informative about men's sexual orientation.

The gay men and lesbian targets in this research were not a random sample from the gay and lesbian population, which creates uncertainty about the extent to which these results can be generalized. Our gay and lesbian targets were recruited primarily from gay and lesbian student organizations and probably were not fully representative of the larger gay and lesbian population. They may likely differ from gay men and lesbians who do not join such groups in many ways; for example, they may be more in tune with gay culture, consider their sexual orientation more central to their self-concepts, or spend more time socializing with gay and lesbian students. Similarly, we can only speculate about how our targets, who willingly consented to have their images used in research about sexual orientation, may differ from people who are more secretive about their sexual orientation. Although these possible differences raise questions about the generalizability of these results, it would have been neither feasible nor ethical to collect data from individuals who did not wish to reveal their sexual orientation.

It is also not clear how well these results would generalize to other settings. This research was conducted at a large urban university in (many would claim) a generally liberal, tolerant environment. Perhaps gay men and lesbians' perception of whether their social environment is tolerant or homophobic would affect their behavior in ways that might be relevant to judgment accuracy. For example, they might be more guarded in their behavior or consciously try to conceal their sexual orientation if they perceive the setting to be homophobic. The social environment might also influence the judgments of sexual orientation. For example, in a more tolerant environment, judges might have more opportunity to interact with gay men and lesbians or be less likely to base their judgments on prevalent stereotypes.

The targets in this research were videotaped behaving naturally and were not particularly motivated to reveal or conceal their sexual orientation. Although this may be analogous to many real-life contexts in which judgments of sexual orientation may be made, clearly there also are instances where people are consciously motivated to conceal their sexual orientation (e.g., because of antigay prejudice) or to make their sexual orientation known (e.g., when pursuing a potential romantic partner). It is uncertain how accuracy at judging sexual orientation would be affected when targets are consciously motivated to conceal or to reveal their sexual orientation.

Finally, it is important to clarify the practical implications of this research. None of our judges were 100% accurate, and none of our targets were identified accurately by every judge. A typical judge's accuracy ranged from approximately 55% in the still photo chan-

nel to approximately 70% in the 10-s silent video channel. In the long run, people's judgments about sexual orientation may be more accurate than chance, but many individual judgments will not be accurate. We emphasize that having a subjective sense of confidence in a judgment does not necessarily mean that the judgment is any more likely to be correct than a judgment about which one feels less certain. For many types of judgments, particularly those involving nonverbal behavior, the relationship between confidence and judgmental accuracy is notoriously poor (DePaulo, Charlton, Cooper, Lindsay, & Muhlenbruck, 1997). Thus, does the fact that sexual orientation can be perceived at better than chance levels imply that every judgment of sexual orientation people make in their everyday lives will be accurate? Absolutely not.

References

Albright, L., Kenny, D. A., & Malloy, T. E. (1988). Consensus in personality judgments at zero acquaintance. *Journal of Personality and Social Psychology, 55*, 387–395.

Ambady, N., Hallahan, M., & Rosenthal, R. (1995). On judging and being judged accurately in zero acquaintance situations. *Journal of Personality and Social Psychology, 69*, 518–529.

Ambady, N., & Rosenthal, R. (1992). Thin slices of expressive behavior as predictors of interpersonal consequences: A meta-analysis. *Psychological Bulletin, 111*, 256–274.

Ambady, N., & Rosenthal, R. (1993). Half a minute: Predicting teacher evaluations from thin slices of behavior and physical attractiveness. *Journal of Personality and Social Psychology, 64*, 431–441.

Barclay, C. D., Cutting, J. E., & Kozlowski, L. T. (1978). Temporal and spatial factors in gait perception that influence gender recognition. *Perception & Psychophysics, 23*, 145–152.

Berger, G., Hank, L., Rauzi, T., & Simkins, L. (1987). Detection of sexual orientation by heterosexuals and homosexuals. *Journal of Homosexuality, 13*, 83–100.

Bernieri, F. J., Davis, J. M., Rosenthal, R., & Knee, C. R. (1994). Interactional synchrony and rapport: Measuring synchrony in displays devoid of sound and facial affect. *Personality and Social Psychology Bulletin, 20*, 303–311.

Buck, R. (1984). *The communication of emotion.* New York: Guilford Press.

Buck, R., Miller, R. E., & Caul, W. F. (1974). Sex, personality, and physiological variables in the communication of affect via facial expression. *Journal of Personality and Social Psychology, 30*, 587–596.

Cass, V. C. (1990). The implications of homosexual identity formation for the Kinsey model and the scale of sexual preference. In D. P. McWirther, S. A. Sanders, & J. M. Reinisch (Eds.), *Homosexuality/heterosexuality: The Kinsey scale and current research* (pp. 239–266). New York: Oxford University Press.

Chapman, B., & Brannock, J. (1987). A proposed model of lesbian identity development: An empirical investigation. *Journal of Homosexuality, 14*, 69–80.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.) Hillsdale, NJ: Erlbaum.

Costanzo, M., & Archer, D. (1989). Interpreting the expressive behavior of others: The interpersonal perception task. *Journal of Nonverbal Behavior, 13*, 225–245.

Cutting, J. E. (1978). Generation of synthetic male and female walkers through manipulation of a biochemical invariant. *Perception, 7*, 393–405.

Cutting, J. E., & Kozlowski, L. T. (1977). Recognizing friends by their walk: Gait perception without familiarity cues. *Bulletin of the Psychonomics Society, 9*, 353–356.

Cutting, J. E., & Proffitt, D. R. (1981). Gait perception as an example of

how we may perceive events. In R. D. Walk & H. L. Pick (Eds)., *Intersensory perception and sensory integration* (pp. 249–273). New York: Plenum.

DePaulo, B. M. (1992). Nonverbal behavior and self-presentation. *Psychological Bulletin, 11,* 203–243.

DePaulo, B. M., Charlton, K., Cooper, H., Lindsay, J. L., & Muhlenbruck, L. (1997). The accuracy-confidence correlation in the detection of deception. *Personality and Social Psychology Review, 4,* 346–357.

Ekman, P. (1973). Cross-cultural studies of facial expression. In P. Ekman (Ed.), *Darwin and facial expression: A century of research in review* (pp. 169–222). New York: Academic Press.

Frable, D. E. S. (1987). Sex-typed execution and the perception of expressive movement. *Journal of Personality and Social Psychology, 53,* 391–396.

Frable, D. E. S., Blackstone, T., & Scherbaum, C. (1990). Marginal and mindful: Deviants in social interactions. *Journal of Personality and Social Psychology, 59,* 140–149.

Frable, D. E. S., Platt, L., & Hoey, S. (1998). Concealable stigmas and positive self-perceptions: Feeling better around similar others. *Journal of Personality and Social Psychology, 74,* 909–922.

Funder, D. C. (1995). On the accuracy of personality judgment: A realistic approach. *Psychological Review, 102,* 652–670.

Gangestad, S. W., Simpson, J. A., DiGeronimo, K., & Biek, M. (1992). Differential accuracy in person perception across traits: Examination of a functional hypothesis. *Journal of Personality and Social Psychology, 62,* 688–698.

Gibson, J. J. (1979). *The ecological approach to visual perception.* Boston: Houghton Mifflin.

Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity.* New York: Simon & Schuster.

Haldeman, D. C. (1994). The practice and ethics of sexual orientation conversion therapy. *Journal of Consulting and Clinical Psychology, 62,* 221–227.

Hall, J. (1984). *Nonverbal sex differences: Communication accuracy and expressive style.* Baltimore: Johns Hopkins University Press.

Hallahan, M. (1998). *Reanalysis of Berger, Hank, Rauzi, & Simkins, 1987.* Unpublished manuscript, Clemson University, Clemson, South Carolina.

Herek, G. M., & Capitanio, J. P. (1996). "Some of my best friends": Intergroup contact, concealable stigma, and heterosexuals' attitudes toward gay men and lesbians. *Personality and Social Psychology Bulletin, 22,* 412–424.

Hurd, K., & Noller, P. (1988). Decoding deception: A look at the process. *Journal of Nonverbal Behavior, 12,* 217–233.

Jeffreys, S. (1993). *The lesbian heresy: A feminist perspective on the lesbian sexual revolution.* Melbourne, Victoria, Australia: Spinifex.

Johannson, G. (1973). Visual perception of biological motion and a model for its analysis. *Perception & Psychophysics, 14,* 202–211.

Johannson, G. (1975). Visual motion perception. *Scientific American, 232,* 76–88.

Kenny, D. A. (1994). *Interpersonal perception: A social relations analysis.* New York: Guilford Press.

Kenny, D. A., Horner, C., Kashy, D. A., & Chu, L. (1992). Consensus at zero acquaintance: Replication, behavioral cues, and stability. *Journal of Personality and Social Psychology, 62,* 88–97.

Kinsey, A., Pomeroy, W., & Martin, C. (1948). *Sexual behavior in the human male.* Philadelphia: W. B. Saunders.

Kitzinger, C., & Wilkinson, S. (1995). Transitions from heterosexuality to lesbianism: The discursive production of lesbian identities. *Developmental Psychology, 31,* 95–104.

Knapp, M. L., & Hall, J. A. (Eds.). (1992). *Nonverbal communication in human interaction* (3rd ed.). New York: Harcourt Brace Jovanovich.

Kozlowski, L. T., & Cutting, J. E. (1977). Recognizing the sex of a walker from a dynamic point-light display. *Perception and Psychophysics, 21,* 575–580.

Linville, S. E. (1998). Acoustic correlates of perceived versus actual sexual orientation in men's speech. *Folia Phoniatrica et Logopaedica, 50,* 35–48.

Mather, G., & West, S. (1993). Recognition of animal locomotion from dynamic point-light displays. *Perception, 22,* 759–766.

McArthur, L. Z., & Baron, R. M. (1983). Toward an ecological theory of social perception. *Psychological Review, 90,* 215–238.

Meng, X., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin, 111,* 172–175.

Noller, P. (1986). Sex differences in nonverbal communication: Advantage lost or supremacy regained? *Australian Journal of Psychology, 38,* 23–32.

Norman, W. T., & Goldberg, L. R. (1966). Raters, ratees, and randomness in personality structure. *Journal of Personality and Social Psychology, 4,* 681–691.

Risman, B., & Schwartz, P. (1988). Sociological research on male and female homosexuality. *Annual Review of Sociology, 14,* 125–147.

Rosenthal, R., & DePaulo, B. M. (1979). Sex differences in accommodation in nonverbal communication. In R. Rosenthal (Ed.), *Skill in nonverbal communication: Individual differences* (pp. 68–103). Cambridge, MA: Oelgeschlager, Gunn & Hain.

Rosenthal, R., Hall, J. A., DiMatteo, M. R., Rogers, P. L., & Archer, D. (1979). *Sensitivity to nonverbal communication: The PONS test.* Baltimore: Johns Hopkins University Press.

Rosenthal, R., & Rubin, D. B. (1978). Interpersonal expectancy effects: The first 345 studies. *Behavioral and Brain Sciences, 3,* 377–386.

Rothblum, E. (1994). Transforming lesbian sexuality. *Psychology of Women Quarterly, 18,* 627–641.

Runeson, S., & Frykholm, G. (1983). Kinematic specification of dynamics as an informal basis for person and action perception: Expectation, gender recognition, and deceptive intention. *Journal of Experimental Psychology: General, 112,* 580–610.

Sahgir, M., & Robins, E. (1973). *Male and female homosexuality.* Baltimore: Williams & Wilkins.

Shiffrar, M., Lichtey, L., & Chaterjee, S. H. (1997). The perception of biological motion across apertures. *Perception & Psychophysics, 59,* 51.

Travis, N. J. C. (1981). A study of the relationship of certain variables to sex characteristic identification from the speech of heterosexual and homosexual individuals (Doctoral dissertation, Louisiana State University and Agricultural & Mechanical College). *Dissertation Abstracts International, 42,* (6-B), 2323B.

Valenti, S. S., & Costall, A. (1997). Visual perception of lifted weight from kinematic and static (photographic) displays. *Journal of Experimental Psychology: Human Perception and Performance, 23,* 181–198.

Waxer, P. (1976). Nonverbal cues for depth of depression: Set versus no set. *Journal of Consulting and Clinical Psychology, 44,* 493.

Waxer, P. (1977). Nonverbal cues for anxiety: An examination of emotional leakage. *Journal of Abnormal Psychology, 86,* 306–314.

Westwood, G. (1960). *A minority: A report on the life of the male homosexual in Great Britain.* Westport, CT: Greenwood Press.

Zebrowitz, L. A., & Collins, M. A. (1997). Accurate social perception at zero acquaintance: The affordances of a Gibsonian approach. *Personality and Social Psychology Bulletin, 3,* 204–223.