

Using Nonverbal Representations of Behavior: Perceiving Sexual Orientation

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Ecological theories of perception (Gibson, 1977, 1979; McArthur and Baron, 1983; Zebrowitz and Collins, 1997) maintain that it is beneficial for people to be able to perceive quickly and accurately aspects of their environment that are relevant to their taking adaptive action. Consistent with this perspective, a growing body of evidence suggests that diverse aspects of the social environment can be perceived accurately from extremely minimal information. For instance, human observers are particularly sensitive to biological motion and can perceive the moving human form extremely rapidly on the basis of minimal information (Johansson, 1976). In addition, biological variables such as age and gender can be perceived accurately from sparse behavioral observations (Cutting and Proffitt, 1981; Johansson, 1975, 1976; Mather and West, 1993; Shiffrar, Lichtey, and Chatterjee, 1997). Thus moving point-light displays (small patches of lights attached to the joints) of only 200 msec provide sufficient information for naïve viewers to identify the locomotion of animals, types of human actions (such as pushups or jumping jacks), and the gender of walkers (Cutting and Kozlowski, 1977; Kozlowski and Cutting, 1977; Cutting, 1978; Runeson and Frykholm, 1983). Given the adaptive nature of this skill, it is not surprising that the perception of biological motion is believed to represent an intrinsic capacity of the visual system, one that is evident in infants three to six months in age (for example, Fox and McDaniel, 1982; Bertenthal, Proffitt, and

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Cutting, 1984) and which appears to be subserved by a specific neural network (Bonda et al., 1996; Grezes et al., 2000).

Certain nonbiological variables can also be accurately judged from minimal information. But those variables most accurately judged from minimal information appear to be biologically relevant to the social perceiver. For instance, the ability to make rapid and appropriate interpretations of a target's affective state confers some survival value, so it is not surprising that the recognition of facial expressions from minimal information takes place spontaneously (Dimberg, Thunberg, and Elmehed, 2000) and without conscious intention (Whalen et al., 1998). Even personality traits such as extroversion can be judged accurately on the basis of extremely brief interactions with complete strangers (compare Albright, Kenny, and Malloy, 1988; Ambady, Hallahan, and Rosenthal, 1995; Funder, 1995). In this chapter we discuss accuracy in judging the important—and to some extent concealable—dispositional¹ (some might argue biological; compare Hamer, 1993; LeVay, 1993; Pattatucci and Hammer, 1995) variable of sexual orientation on the basis of brief observations of nonverbal behavior. Having conducted a series of studies investigating this issue, we will first summarize here our findings regarding the accuracy and efficiency of the use of nonverbal representations of behavior as well as preliminary investigations into the specific cues that mediate judgments of sexual orientation. Then we will discuss the extent to which the display of these cues can be consciously controlled.

Accuracy in Judging Sexual Orientation

A few previous studies investigating accuracy in judging sexual orientation have yielded somewhat inconsistent results. One study concluded that sexual orientation could not be judged accurately from 2–3 min videoclips (Berger et al., 1987; see Ambady, Hallahan, and Conner, 1999, for a discussion of the interpretation of Berger et al., 1987). Other studies have found that there seem to be identifiable cues that may convey information about sexual orientation. Thus men's sexual orientation was found to be judged accurately on the basis of 1.5 min audio clips (Linville, 1998). Further, lesbians were perceived

to have more masculine speech than heterosexual women and gay men were perceived to have more feminine speech than heterosexual men (Travis, 1981).

Ambady, Hallahan, and Conner (1999) conducted a series of studies to examine the accuracy of judgments of sexual orientation from brief dynamic (10 sec and 1 sec silent video clips) as well as static cues (a series of still photos). Heterosexual and gay/lesbian targets (people whose sexual orientation was being judged) were recruited from various Harvard University graduate student organizations, including gay, lesbian, and bisexual student organizations. The final sample consisted of ten women (five lesbian, and five heterosexual) and fifteen men (eight homosexual and seven heterosexual) targets. To disguise the purpose of the research, information about targets' sexual orientation was obtained with a single question that was embedded in a longer questionnaire with a number of filler questions (such as questions about anxiety, alcohol consumption, and religiosity).

Targets later returned to the laboratory for what they were told was research investigating how students handle the competing demands of academic and extracurricular activities. They were videotaped for one minute as they discussed this issue. After being videotaped, targets were informed of the nature of the study and were asked to consent to have their videotape shown to people who would make judgments about their sexual orientation. At that point they were given the option of withdrawing and having the tape erased. Thus we ensured that the targets behaved as naturally as possible and were making no explicit attempt either to hide or to express their sexual orientation.

A silent 10 sec clip was created for each of the twenty-five participating targets by extracting the 25th through the 35th second of their videotape. Silent 1 sec clips were extracted from the middle of the 10 sec clip. Eight still photos were selected by freezing frames every 700 msec from the middle 5 sec of the 10 sec clip.

Ninety-six judges (people who made judgments of the targets' sexual orientation) were recruited from undergraduate residence halls as well as from various undergraduate organizations, including gay and lesbian organizations. Forty-eight of the judges were women (twenty-four homosexual and twenty-four heterosexual) and forty-eight were

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men (twenty-four homosexual and twenty-four heterosexual). All judges rated each of the three conditions (10 sec silent video, 1 sec silent video, 8 still pictures). Judges rated on a seven-point scale the extent to which they thought each target person was homosexual and, in a separate question, heterosexual. These two questions, which were strongly inversely related, were combined to obtain an overall measure of the judges' perception of the targets' sexual orientation.

Accuracy was significantly greater than chance for all three conditions, but was greatest for judgments based on 10 sec silent clips. In this condition, all (32/32) of the judges had greater-than-chance accuracy (that is, greater than 50 percent correct), and the typical judge correctly classified about 70 percent of targets (average = 69.97%, median = 72.00%). For the 1 sec silent clips, 97 percent (31/32) of the judges had greater-than-chance accuracy, and the typical judge correctly classified about 60 percent of targets (average = 61.13%, median = 60.00%). In the still-photo condition, 84 percent (27/32) of the judges had greater-than-chance accuracy, and the typical judge correctly classified about 55 percent of targets (average = 54.25%, median = 56.00%).

We computed a planned contrast to assess the extent to which accuracy was significantly greater in the two conditions with dynamic cues (10 sec and 1 sec) than in the static still-photo condition, $t(93) = 6.58, p < .05$. This trend supports previous work indicating that dynamic cues generally yield more accurate perceptual judgments than static cues (Barclay, Cutting, and Kozlowski, 1978; Valenti and Costall, 1997).

Clearly, targets' nonverbal behavior, particularly their dynamic behavior, conveys information that individuals use in making accurate judgments. Of course, although judgments of sexual orientation were more accurate than random guesses, this does not imply that any individual judgment of sexual orientation will be accurate in every case. The most accurate judges in this study judged sexual orientation accurately 80 percent of the time.

Individual Differences in Judgment Accuracy

In general, people are able to judge sexual orientation more accurately than chance. But are there individual differences in this ability? It is a

common popular perception that some people are particularly good at perceiving sexual orientation. This perception is particularly strong among gay men. For example, in a study drawing on survey data, 71 percent of gay men versus 44 percent of lesbians reported that they could accurately judge sexual orientation (Sahgir and Robins, 1973). The ability to recognize sexual orientation without any discernible overt cues is sometimes called "gaydar" in popular culture. For example, DiLallo and Krumholtz (1994) in their self-proclaimed "Unofficial Gay Manual," define gaydar as "the instinctual ability to ascertain that another guy is gay, even in the absence of telltale signs" (p. 218). Gaydar is considered linked not to any cues involving dress or jewelry but, rather, to subtle nonverbal cues, and is often thought to be an ability unique to gay men.

We sought to test the extent to which popular beliefs about judging sexual orientation were supported under more controlled conditions by comparing the accuracy of gay/lesbian and heterosexual judges. Gay/lesbian and heterosexual judges were not significantly different in their accuracy in judging 10 sec clips, $F_{(1,28)} = 0.25, p = .62$. Gay and lesbian judges, however, were significantly more accurate than heterosexual judges in the 1 sec clip condition, $F_{(1,28)} = 5.90, p = .02$, though this difference was attributable more to the superior performance of lesbians than to that of gay men. Gay men and lesbians also judged sexual orientation on the basis of still photos more accurately than heterosexuals, $F_{(1,28)} = 4.14, p = .05$. This finding suggests that gay men and lesbians have an advantage in judging sexual orientation and that they seem to have the greatest advantage when the available information is relatively sparse.

Figural Outline Displays

The difference in accuracy based on dynamic information (10 sec and 1 sec silent videotapes) and static information (still photo) suggests that nonverbal communication channels, such as gestures, convey information about sexual orientation beyond what is available in more static aspects of appearance, such as hairstyle, clothing, or jewelry. To further examine the role of dynamic nonverbal behavior in conveying information about sexual orientation, we conducted an experiment in-

investigating the judgment of sexual orientation from dynamic outlines of the targets. These figural outlines retained information about the targets' gestures and other nonverbal behavior, but obscured other more static aspects of their appearance.

Using a special-effects generator, nineteen of the original twenty-five 10 sec silent videoclips were altered to display the target persons as white silhouettes against a black background.² Additionally, the target persons' faces were obscured. The resulting images showed the targets' gestures and movement but did not show their facial expression or more static aspects of their appearances like their clothing, jewelry, or hairstyle. Sixteen judges rated targets' sexual orientation based on observations of these 10 sec figural outline displays. Overall, 94 percent (15/16) of the judges had greater-than-chance accuracy (that is, greater than 50 percent correct), and the typical judge correctly classified approximately 60 percent of targets (average = 59.76%), which was significantly above what would be expected by chance.

Cues Related to Sexual Orientation

In addition, we have been investigating accuracy in judging the gender of homosexual and heterosexual participants from point-light or biological motion displays (Ambady, Hallahan, and Dudkin, 2000). We hypothesized that gay men and lesbians would more often be misclassified in terms of their gender than would their heterosexual counterparts. Thirty-two participants (eight heterosexual females, eight heterosexual males, eight lesbians, and eight gay men) were videotaped walking, running, jumping, and pretending to pick up a heavy box. All participants were videotaped in a dark room wearing dark clothing. To obtain a sagittal point-light display, we attached biker's personal safety lights to the shoulders, elbows, wrists, hips, knees, and lower ankles of the walkers. One light was attached to the hat each walker wore. Clips for each participant were approximately 50 seconds long.

Undergraduate judges were asked to rate the gender of each walker. Results indicated that lesbians were significantly more likely to be judged to be more male than heterosexual females, $t_{(15)} = 2.47, p < .01$. No significant differences were found, however, between heterosexual

male and gay male walkers. This result suggests that, for women, subtle behavioral differences associated with sexual orientation are observable in point-light displays of dynamic movement. There was no clear evidence of a similar difference between gay and heterosexual men, though the sample for this preliminary investigation may not have been large enough to detect an existing effect. Thus the biological motion evidence indicates that lesbians are more likely to be misclassified as male from their gait than are heterosexual women.

Cues Related to Accurate Detection

Are there certain behaviors that provide clues to sexual orientation? To examine this issue, we had two coders rate a number of behaviors thought to be related to judgments of masculinity and femininity for each of the 10 sec clips of each of the twenty-five targets in the Ambady, Hallahan, and Conner (1999) study. The following behaviors were rated on a five-point scale: characteristics of gestures (fastness, smoothness, broadness, using the body to gesture); body position (elbows and hands away from body, arms symmetrical or crossed, limp wrist, fidgeting, leaning forward, shoulders kept erect, legs positioned apart, legs symmetrical or crossed, head tilt); overall style (smooth versus jerky, expressive, masculine, feminine); facial expression (gazing down, frowning, laughing, smiling, open smile, animated expression); and physical appearance (nontraditional dress, neatness of grooming, black clothing). Frequency counts per 10 sec were obtained for the following behaviors: number of gestures, head nods, head shakes, and touching clothing or hair. The mean reliability between the coders was $r = .64$.

For males ($n = 15$), there were a number of behaviors that were strongly related to sexual orientation. Gay men were judged to be more neatly groomed than heterosexual men ($r = .75, p = .001$). Heterosexual men were more likely to nod ($r = -.54, p = .04$) and to lean forward ($r = -.51, p = .05$) than gay men. A number of other correlations approached conventional significance levels: gay men were more likely to smile ($r = .48, p = .07$), to sit with shoulders erect ($r = .47, p = .07$), to have a smooth style ($r = .45, p = .09$), and to be perceived as expressive ($r = .45, p = .10$).

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Among women ($n = 10$), heterosexuals were more likely to be perceived as having a smoother style than lesbians ($r = -.73, p = .02$). Lesbians were more likely to sit with their feet firmly on the ground ($r = .68, p = .03$) and were more likely to be perceived as being masculine ($r = .63, p = .05$) than heterosexual women. Additionally, heterosexual women were perceived to be more feminine ($r = -.61, p = .06$) than lesbian women.

Given the relatively small number of targets (ten women and fifteen men), these preliminary results must be interpreted with great caution. Although, at a general level, they suggest that some behavioral cues do convey information about sexual orientation, these sample correlations are not likely to provide especially precise estimates of the true size of the relationship between sexual orientation and specific nonverbal cues. More extensive data collection is needed to discern what specific cues tend to be associated with sexual orientation and precisely how strongly they are related to accurate judgments of sexual orientation.

Can Cues Associated with Sexual Orientation Be Consciously Controlled?

So far, this chapter has discussed research on the accuracy of judging sexual orientation that is based on observations of people who are neither explicitly attempting to conceal nor explicitly attempting to express their sexual orientation. However, we do not know the extent to which the cues that mediate accurate perception of sexual orientation can be consciously controlled. We are currently investigating whether sexual orientation can be judged accurately from dynamic nonverbal behavior when gay and lesbian participants explicitly attempt to conceal their sexual orientation (Ambady, Hallahan, and Dudkin, 2000). We present preliminary findings below.

Ten gay men and ten lesbians were recruited from the general community to serve as targets. Each target was videotaped in three different conditions: (a) behaving naturally, (b) trying to pass as heterosexual, and (c) exaggerating his or her sexual orientation (all targets did the behaving naturally condition first, and the order of the "exaggerate" and "pass" conditions was counterbalanced across tar-

gets). Twenty-two heterosexuals (eleven men, eleven women) were recruited to serve as targets and were videotaped behaving naturally. Brief video clips (1 sec and 2 sec) were extracted for each target in each condition. For both the 1 sec and 2 sec clips, three different versions of a master videotape were created. Each version contained the twenty-two heterosexual targets behaving naturally and one of the three conditions for each of the twenty-two gay and lesbian targets. The master tapes were counterbalanced so that each gay and lesbian target appeared once in each of the three conditions across the three tapes.

Fifty-four people (fourteen gay men, one bisexual man, fourteen heterosexual men, ten lesbians, five bisexual women, and ten heterosexual women) were recruited to judge the sexual orientation of the targets from the 1 sec video clips, and forty-nine people (twelve gay men, one bisexual man, eleven heterosexual men, eight lesbians, one bisexual woman, and sixteen heterosexual women) were recruited to judge the sexual orientation of the targets from the 2 sec video clips. Each judge watched one version of the master videotape and rated the targets' sexual orientation.

Interestingly, accuracy in judgments of male targets did decrease when targets were trying to conceal their sexual orientation. On the basis of 1 sec clips, judges correctly discerned the sexual orientation of 48 percent of targets in the "pass" condition and 62 percent of targets in both the "normal" and the "exaggerate" conditions. Similar results were found in the 2 sec condition; judges correctly judged 38 percent of targets in the "pass" condition and 52 percent of targets in the normal and exaggerate conditions. Judges were similarly accurate at judging the sexual orientation of women targets regardless of whether they were trying to conceal their sexual orientation. On the basis of 1 sec clips, judges correctly judged the sexual orientation of 65 percent, 83 percent, and 78 percent of the women in the "pass," "normal," and "exaggerate" conditions, respectively. Similarly, on the basis of 2 sec clips, judges correctly judged the sexual orientation of 87 percent, 78 percent, and 83 percent of the women in the "pass," "normal," and "exaggerate" conditions respectively.

These results suggest that, to some extent, people are able to control the display of the cues that provide information about sexual

orientation seem to be

Conclusion

Thus judgments from a male perspective are considerably different. Judgments of women targets are more accurate when they are trying to conceal their sexual orientation. This is not an isolated finding regarding sexual orientation cues that can be used to make

Previous research on the system is limited to a study of very male targets (Johansson, 1975, 1977, 1997). For example, prior are not (Johansson, 1975, 1977, 1997). For example, only 1 second of sexual orientation was detected in the outlines. The position of the target's head and torso to make

Notes

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1. By using a control condition, we were able to control the effect of the target's sexual orientation on the judge's judgment.

orientation. However, our preliminary investigation suggests that men seem to be better able to control the display of cues than women.

Conclusion

Thus judgments regarding sexual orientation can be made accurately from a mere slice of behavior. Static information, however, yields considerably less accurate judgments than does dynamic information. Judgments of sexual orientation remain fairly accurate (more so for women than for men), even when participants explicitly attempt to conceal their orientation. These results suggest that sexual orientation is not an invisible, completely concealable category: information regarding sexual orientation is transmitted through subtle behavioral cues that can be detected accurately.

Previous research on motion perception has shown that the visual system is remarkably adept at identifying moving objects on the basis of very minimal information (Cutting and Proffitt, 1981; Johansson, 1975, 1976; Mather and West, 1993; Shiffrar, Lichtey, and Chatterjee, 1997). For example, information in a few successive frames of behavior are enough for the categorization and organization of information (Johansson, 1976). This study shows that even with an exposure of only 1 sec, naive judges can judge the very subtle category of sexual orientation at above-chance levels. Further, sexual orientation can be detected even from substantially degraded information such as figural outlines. The present results suggest that human beings can detect dispositional information from motion. This work highlights the effectiveness and efficiency of using representations of nonverbal behavior to make ecologically valid judgments.

Notes

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1. By using the term "dispositional" we are not making any assertions about the etiology of sexual orientation. Rather, we use the term to indicate a behavioral pattern of arousal by members of the same, opposite, or both

- sexes, in the same way that we might use the term "extroversion" to indicate a behavioral pattern of being outgoing.
2. Figural outline displays were not be generated for six of the original targets because they did not make any gestures or movements during their 10 sec clips.

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