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Report

Female sexual orientation is perceived accurately, rapidly, and automatically from the face and its features

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ABSTRACT

Whereas previous work has shown that male sexual orientation can be accurately and rapidly perceived from the human face and its individual features, no study has examined the judgment of female sexual orientation. To fill this gap, the current work examined the accuracy, speed, and automaticity of judgments of female sexual orientation from the face and from facial features. Study 1 showed that female sexual orientation could be accurately judged from the face and from just eyes without brows and limited to the outer canthi. Study 2 then examined the speed and efficiency of these judgments, showing that judgments of the faces following very brief, near subliminal (40 ms) exposures were significantly better than chance guessing. Finally, Study 3 tested the automaticity of judgments of female sexual orientation by examining the effects of deliberation on accuracy. Participants who made snap judgments of female sexual orientation were significantly more accurate than participants who made thoughtful and deliberated judgments. These data therefore evidence a robust, reliable, and automatic capacity for extracting information about female sexual orientation from nonverbal cues in the face.

Information about individuals is readily extracted from their appearance, particularly from their faces (Zebrowitz, 1997). For instance, cues such as emotional expression may provide information about whether an individual should be approached or avoided (Marsh, Ambady, & Kleck, 2005) and cues such as eye gaze may provide information about an individual's intentions or state of mind (Baron-Cohen, 1994). In most cases, the nonverbal cues from others' facial appearance and facial behaviors are obvious to us as perceivers. We know that emotional expression provides information about disposition (see Russell, Bachorowski, & Fernandez-Dols, 2003), and that eye gaze provides information about focus of attention (Langton, Watt, & Bruce, 2000).

Similar cues operate to distinguish social groups, as well. We are aware of the features that distinguish members of different racial groups (Maddox, 2004), that distinguish men from women (Brown & Perrett, 1993; Macrae & Martin, 2007), and that distinguish the elderly from the young (Wright & Stroud, 2002). Thus, groups defined by race, sex, and age tend to be very perceptually obvious. These groups possess specific cues that we cannot help but notice and attend to regularly, as reflected by both our conscious (Macrae & Bodenhausen, 2000) and non-conscious (Brewer, 1988) behaviors.

Not all groups are defined by clear and obvious physical markers, however. There are many groups for whom the defining features are ambiguous. Typically, we tend to be both less certain and less accurate when judging more ambiguous groups than when categorizing individuals into groups that are perceptually obvious. One such distinction is that between Jewish and non-Jewish persons. A host of studies in the mid-20th century examined the detectability of who is Jewish and who is not from various nonverbal cues. On the whole, perceivers were more accurate than chance guessing in their judgments (see Andrzejewski, Hall, & Salib, 2009; Rice & Mullen, 2003). But they were also unsure of the basis for many of their judgments, in some cases forming less accurate impressions with increased information (Savitz & Tomasson, 1959).

A more contemporary example of a perceptually ambiguous distinction is that between persons with different sexual orientations. Studies have shown that individuals form reliable and accurate judgments of sexual orientation from various nonverbal cues, including posture and gesture (Ambady, Hallahan, & Conner, 1999), and body shape and gait (Johnson, Gill, Reichman, & Tassinary, 2007). More recently, researchers have reported evidence that perceivers accurately judge male sexual orientation from faces. One study found that judgments of individual facial features permitted accurate judgments of male sexual orientation, even when judgments were limited to just the target individuals' eyes (Rule, Ambady, Adams, & Macrae, 2008). Moreover, judgments of male sexual orientation based on perceptions of the faces for only 50 ms (milliseconds) also allowed for accurate predictions (Rule & Ambady, 2008). This was true when the targets were viewed both

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from full faces and when their hairstyles were digitally removed from the photographs. Given that these face effects have been exclusive to judgments of men's sexual orientation, however, one goal of the current work was to extend these findings by examining the judgment of female targets.

Previous work on the perception of differences between straight and lesbian women has highlighted a series of particular aspects of appearance that are believed to be distinctive. Krakauer and Rose (2002), for example, reported that women became less traditionally feminine in their appearance after coming out as lesbian. Specifically, they were less likely to wear makeup or dresses and reported cutting their hair shorter. Of course, these changes do not apply to all lesbian women. Indeed, there is much evidence for individual differences in both the expression (Rosario, Schrimshaw, Hunter, & Levy-Warren, 2009; Smith & Stillman, 2002) and impact (Myers, Taub, Morris, & Rothblum, 1999; Pitman, 2000) of traditional female body image standards within the lesbian community. Thus, given the diversity that exists in style and appearance within the lesbian community, we wondered whether facial cues may distinguish straight women from lesbian women, as they have been found to do for gay men and straight men. In Study 1, we examined whether female sexual orientation could be accurately judged from the face and from a minimal cue previously found distinctive for male sexual orientation: the eyes. In Study 2 we then explored the efficiency of these judgments by asking participants to categorize women's faces as lesbian or straight with just 40 ms of viewing time. Finally, in Study 3 we investigated the mechanisms that underlie these judgments. Previous work examining male targets has suggested that sexual orientation may be construed automatically (Rule, Macrae, & Ambady, 2009). Yet it has been presumed that automatic categorization applies only to age, race, and sex (Brewer, 1988; Messick & Mackie, 1989). To examine this directly, in Study 3 we compared participants' accuracy in judging sexual orientation from snap judgments versus thoughtful and deliberated judgments.

Study 1

Can female sexual orientation be judged from faces? If so, what features might be involved? Previous work has found that men's sexual orientation can be accurately discriminated from their faces and facial features (Rule et al., 2008). To test whether these effects extend to female sexual orientation, as well, we asked participants to provide categorizations of women as either lesbian or straight based on images of the full face (Study 1A) and from just the eyes (without brows and limited to the outer canthi, Study 1B).

Study 1A

Stimuli

Photos of 100 self-identified lesbian and 100 self-identified straight women were obtained from online dating websites posted for use in five randomly-selected major, non-local US cities (Miami, Chicago, Los Angeles, New York, and Seattle). Search criteria required that the women identify as Caucasian and between 20 and 30 years of age. Photos of women with visible headwear, facial piercings, jewelry, or secondary facial hair were not selected for use. We downloaded the first 20 lesbian and 20 straight women's photos meeting the search criteria in each city. Each image was cropped to include only the face, limited to the bottom of the chin, top of the hair, and sides of hair or ears (whichever was more extreme). The images were cropped from their original background and placed onto a white background, standardized for size, and converted to grayscale (see Fig. 1A). Two straight targets and six lesbian targets were excluded because they were wearing glasses.

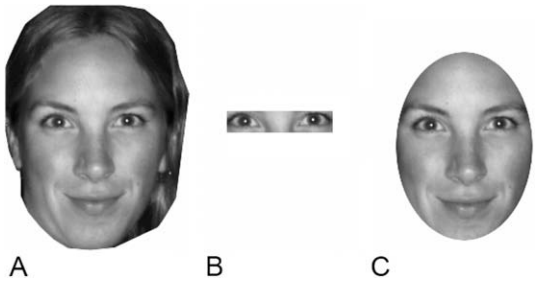

Fig. 1. Sample stimuli from a volunteer not included in the actual experiments: (A) full face (Study 1A); (B) just eyes without brows or outer canthi musculature (Study 1B); (C) face without hair or shape (Studies 2–3).

Thus, the final number of targets was 192 (98 self-identified straight women, 94 self-identified lesbian women). To respect privacy and anonymity, none of the targets' actual sexual orientations was disclosed to any participants and no participants reported any familiarity with any of the targets. Additionally, the photos were pre-tested for potential confounds relating to stereotypes about straight and lesbian women, such as emotional expression (Hess, Adams, & Kleck, 2005) and use of makeup (Krakauer & Rose, 2002). Three naïve research assistants (Cronbach's $\alpha = .84$) coded the faces for the level of affect displayed by each target along an 8-point scale (0 = "Neutral", 4 = "Happy", 7 = "Very Happy") and an additional three research assistants (Cronbach's $\alpha = .70$) coded the faces for the amount of makeup worn by each target along an 8-point scale (0 = "None", 1 = "Very Little", 4 = "Some", 7 = "Very Much"). The lesbian and straight women did not differ either in affect [$t(190) = 1.71$, $p = .09$, $r = .12$] or amount of makeup worn [$t(190) = 1.27$, $p = .21$, $r = .09$].

Procedure

Twenty-one undergraduates ($n = 16$ females)[1] viewed each of the 192 photos in a randomized order using DirectRT experimental software. Each image appeared on the screen and participants were asked to indicate via key-press whether they believed each face belonged to either a lesbian woman ("L" key) or straight woman ("S" key). Although the judgments were self-paced, participants were encouraged to work quickly and to use their gut instinct. The average response time to categorize each target was 1197 ms ($SE = 90$ ms).

Results and discussion

Data were analyzed using signal detection. Categorizations of lesbian women's faces as lesbian were counted as hits ($M = .34$, $SD = .12$) and categorizations of straight women's faces as lesbian were counted as false-alarms ($M = .22$, $SD = .11$). A' values were then calculated using the formula provided by Rae (1976) and measures of response bias (B') were calculated using the formula provided by Quanty, Keats, and Harkins (1975).

Participants' accuracy in discriminating lesbian from straight women was significantly better than chance guessing (.5): $M_{A'} = .64$, $SD = .05$; $t(20) = 12.88$, $p < .001$. Measures of response bias showed that participants tended to classify women as straight, rather than lesbian: $M_{B'} = .18$, $SD = .14$. Women's sexual orientations can therefore be accurately discerned from facial cues, as previous studies have shown for men (e.g., Rule et al., 2008). To explore what facial features may be involved in these judgments, Study 1B examined one minimal cue found to be distinctive for men's sexual orientations: the eyes.

[1] Participant sex had no significant effect on accuracy [$t(96) = 1.41$, $p = .16$] or response bias [$t(96) = 1.52$, $p = .13$] for any studies reported in this work and is subsequently not discussed.

Study 1B

Each of the 192 photos used in Study 1A was cropped so that only the eyes were visible. This excluded eyebrows and was limited to the outer canthi of the eyes so that not even wrinkles from primary contractions of the orbicularis oculi muscles (commonly referred to as "crow's feet") were visible; see Fig. 1B. Twenty undergraduates (n = 6 females) provided judgments of the eyes following the same procedures as in Study 1A. The mean response time to categorize each stimulus was 1248 ms (SE = 152 ms).

Results and discussion

Data were again analyzed using signal detection (M_{Hits} = .33, SD = .16; $M_{False\ alarms}$ = .32, SD = .16). Participants' accuracy in categorizing straight and lesbian women's eyes was significantly greater than chance [$M_{A'}$ = .53, SD = .06; $t(19)$ = 2.17, p = .04] and showed a bias towards categorizing targets as straight more often than lesbian ($M_{B'}$ = .05, SD = .13).

Comparisons between Studies 1A and 1B showed no differences in response latencies[2] [$t(39)$ = .11, p = .91] but significant differences for both accuracy [$t(39)$ = 6.32, p < .001] and response bias [$t(39)$ = 2.91, p = .006]. Thus, participants were both significantly more accurate and more likely to rate targets as straight, rather than lesbian, for judgments based on the full face than for judgments limited to just the eyes.

Therefore, even when restricted just to women's eyes, without cues from the brows or key elements of facial musculature present, participants were able to accurately distinguish straight and lesbian women at levels significantly better than chance guessing. This finding replicates parallel work done comparing gay men and straight men (Rule et al., 2008) and, given its limited scope, is intriguing. Although we are limited by the images' resolution in determining what particular components of the eyes are successfully communicating information about sexual orientation, these findings still show the sensitivity of the perceptual system in extracting information about group membership from minimal cues.

Study 2

Study 1B showed that individuals could accurately distinguish female sexual orientation from nothing more than grayscale photographs of women's eyes. This finding indeed demonstrates a near physical limit on the accuracy of judging sexual orientation from nonverbal cues. Aside from physical limits in perception, however, there are temporal limits, as well. For instance, Rule and Ambady (2008) tested participants' ability to accurately judge male sexual orientation from faces without hair at brief exposures and found that perceivers' judgments following just 50 ms exposures to the faces was equivalent in accuracy to perceptions made with longer durations, such as participants' self-paced rates. When exposure time reached subliminal levels, however (i.e., 33 ms of exposure), participants performed no better than chance. In Study 2 we therefore sought to test exposure time and the accuracy of judgments of sexual orientation from women's faces. We choose a 40 ms exposure time because it is just above subliminal levels. Given the rapid speed at which the faces were to be presented, cues from face shape—including the contribution of hairstyle to face shape—may become hyper-salient (see Rule & Ambady, 2008). Thus, we asked participants to judge women's sexual orientations at 40 ms from faces cropped into ovals to remove the hair and outer face shape.

Method

Each of the 192 photos used in Study 1A was cropped into an oval that displayed only the internal features of the face (see Fig. 1C). Twenty-one participants (n = 9 females) were instructed that they would be seeing a series of women's faces and that their task would be to judge how likely they believed it was that each face corresponded to a lesbian woman ("L" key) or straight woman ("S" key) via key-press. Participants were informed that they would see the face for a very short period of time and were given several practice trials with faces not otherwise used in the experiment to acquaint them with the speed of the trials. After the practice trials, participants were reminded of their instructions and encouraged to ask the experimenter if they had any questions; none did.

Each face was presented for 40 ms using DirectRT software. The order of presentation of the faces was random. Prior to each face, a fixation cross appeared for 1000 ms to orient participants' attention to the center of the computer screen where the face would appear. The face was then shown for 40 ms and immediately replaced by a backward mask consisting of high and low spatial frequencies for 100 ms. Participants were then prompted to categorize the preceding target face as either straight or lesbian. Participants were not restricted in the amount of time they had available to make their response but were encouraged to work quickly and to rely on their gut instinct. The average response time was 812 ms (SE = 72 ms). After each judgment, participants were given 1250 ms of rest before the next trial began. See Fig. 2 for an illustration of this procedure.

Results and discussion

Data were analyzed using signal detection, as above (M_{Hits} = .38, SD = .18; $M_{False\ alarms}$ = .33, SD = .16). Participants' accuracy was significantly better than chance guessing [$M_{A'}$ = .55, SD = .06; $t(20)$ = 3.22, p = .004] and showed a bias towards categorizing women's faces as straight, rather than lesbian: $M_{B'}$ = .03, SD = .06.

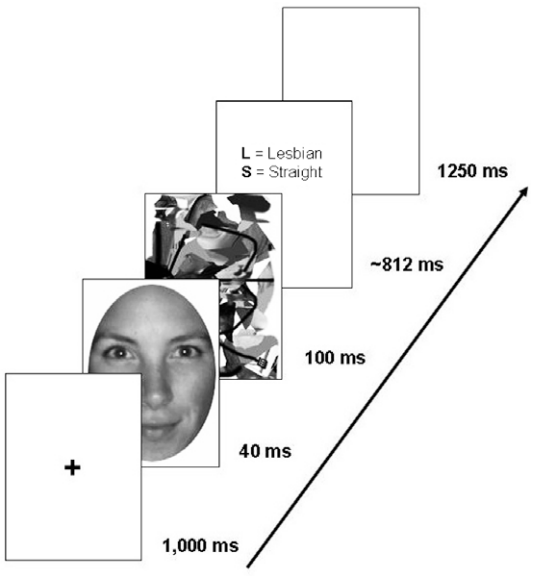

Fig. 2. Illustrated procedure for Study 2: Participants first saw a fixation cross for 1000 ms followed by the presentation of the face for 40 ms and a backward mask of high and low spatial frequencies for 100 ms. They then made judgments as to whether the face pictured a straight woman or lesbian woman; mean response time for these judgments was 812 ms. Finally, participants were given a 1250 ms rest between trials.

[2] All response latencies reported in this work were transformed using the natural logarithm to achieve normality. The results of significance tests did not differ, however, when untransformed values were used.

Participants' ability to accurately categorize women's faces as straight and lesbian without cues from hair or face shape following just 40 ms of exposure to the face is intriguing. To rule out the possibility that a small subset of faces may be driving these effects, we performed a second analysis treating targets as the unit of analysis, rather than participants as the unit of analysis. Thus, we calculated percent correct scores for each target based on the proportion of correct identifications for each face across participants. These data are plotted as a histogram in Fig. 3 within 5% bins. Inspection of the frequencies shows that no single face was categorized with complete accuracy (100%) or complete inaccuracy (0%). Similarly, full consensus among participants was not reached for any individual target. The data show a slight negative skew ($S = -.22$, $SE = .18$), reflecting the greater than chance (i.e., midpoint: 50%) accuracy of the categorizations. Thus, it does not appear that a small number of faces are driving this effect. Similarly, the absence of full consensus for any one target illustrates that these data do not speak to the ability to judge any single person accurately but, instead, speak to the general ability of the average perceiver to detect the cues to female sexual orientation that are encoded in the face.

Study 3

The brief exposure time needed to accurately perceive female sexual orientation suggests that the judgments are highly efficient and therefore may occur automatically. Previous work has suggested that automaticity in social categorization is exclusive to age, race, and sex, which may serve as the primary organizing dimensions for humans' categorizations of others (e.g., Brewer, 1988). We therefore wanted to test whether the categorization of sexual orientation might be automatic. One way to gauge automaticity is to measure whether disrupting a judgment thought to be automatic impairs the quality of the judgment. For instance, thinking and reasoning can impair automatic judgments (e.g., Dijksterhuis, Bos, Nordgren, & van Baaren, 2006; Wilson & Schooler, 1991). If sexual orientation judgments are automatic, accuracy should be impaired when participants deliberate and over-think while making their judgments. In Study 3 we therefore asked participants to judge female sexual orientation based on either quick and intuitive snap judgments or thoughtful and deliberated impressions.

Method

Stimuli and participants

Thirty-six undergraduates categorized each of the 192 photos of straight and lesbian women without hair and face shape from Study 2. Twenty participated in the snap judgment condition ($n = 12$ females) and 16 participated in the deliberation condition ($n = 8$ females).

Procedure

Snap judgment condition. Participants were instructed that they would be seeing a series of women's faces and that their task would be to judge how likely they believed it was that each face corresponded to a lesbian woman ("L" key) or straight woman ("S" key). Participants were instructed to make their decision as quickly as possible. They were specifically instructed not to think about any one face too much but to rely on their gut instinct and first impression. The average response time was 1146 ms ($SE = 90$ ms).

Deliberation condition. Participants were instructed that they would be seeing a series of women's faces and that their task would be to judge how likely they believed it was that each face corresponded to a lesbian woman ("L" key) or straight woman ("S" key). Critically, they were told that previous studies have found that judgments of sexual orientation from men's faces can be made accurately but only when individuals really concentrate and think about it carefully. They were warned not to be misled by their "gut instinct" and to make the choice that seemed most reasonable. Finally, they were encouraged to take their time and really think about their answer before they made a decision. Thus, we encouraged participants to deliberate heavily and the average response time was 2373 ms ($SE = 425$ ms).

Manipulation check

To assure that participants in the two conditions did make snap judgments and deliberated judgments, we compared the response latencies for the two conditions. Indeed, participants in the snap judgment condition were significantly faster in judging women's sexual orientations than were participants in the deliberation condition: $t(34) = 4.08$, $p < .001$.

Results and discussion

Data were analyzed using signal detection, as above (Snap judgment condition: $M_{Hits} = .42$, $SD = .12$; $M_{False\ alarms} = .33$, $SD = .10$; Deliberation condition: $M_{Hits} = .35$, $SD = .15$; $M_{False\ alarms} = .32$, $SD = .13$). In the snap judgment condition, participants' accuracy was significantly better than chance guessing [$M_{A'} = .58$, $SD = .05$; $t(19) = 7.74$, $p = .001$] and showed a bias towards categorizing women's faces as straight, rather than lesbian: $M_{B'} = .04$, $SD = .04$. In the deliberation condition, however, participants' accuracy was not significantly different from chance [$M_{A'} = .53$, $SD = .08$;

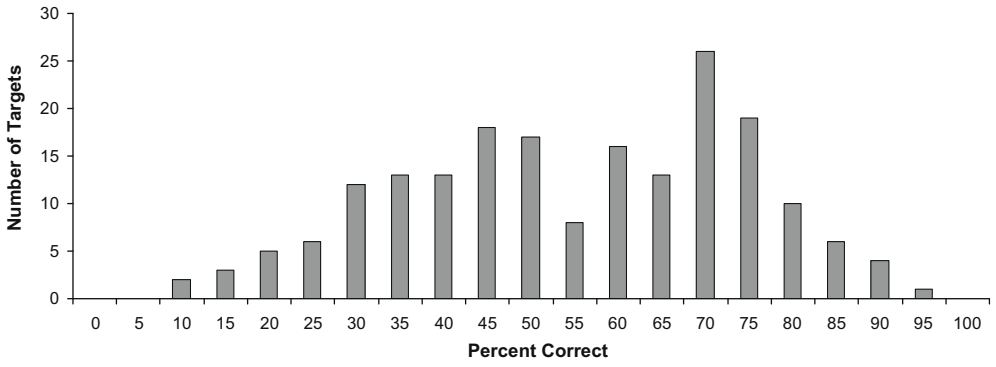

Fig. 3. Histogram showing accuracy levels for each stimulus in Study 2. The percentage of correct categorizations is plotted on the *x*-axis and the number of targets with that frequency of correct categorizations is plotted on the *y*-axis. Frequencies are divided into 5% bins, rather than reflecting precise values.

$t(15) = 1.69$, $p = .11$] though participants still showed a bias towards categorizing the faces as straight, rather than lesbian: $M_{B'} = .02$, $SD = .09$. Additionally, participants in the snap judgment condition were significantly more accurate than participants in the deliberation condition: $t(34) = 2.43$, $p = .03$.

Participants' above-chance accuracy for judgments made based on snap judgments suggests that additional deliberation may be misleading. That categorizations of female sexual orientation can be made so quickly, accurately, and from minimal information suggests that this process may be automatic. The observation that deliberation disrupts this accuracy provides additional evidence to suggest that the construal of female sexual orientation is an automatic process. Previous work has suggested that automaticity in social categorization may be exclusive only to age, race, and sex (e.g., Brewer, 1988; Messick & Mackie, 1989). The current data show that this effect extends to a fourth group, however (see also Rule et al., 2009). One explanation for this could be that sexual orientation is an overlooked dimension that belongs within these "master status" categories. Another possibility, however, is that automaticity is not restricted to any particular group or set of groups. Rather, the capacity to categorize others may be a flexible process that adapts to any important social group. Further research will be needed to determine which of these hypotheses is more likely true.

Manipulation check

One limitation of using personal advertisements is that individuals' photos may be biased by self-selection. This possibility could limit the generalizability of the current findings and promote Type-I error if individuals strive to represent themselves as exemplars of their groups. Previous research, however, reported that individuals attempt to represent themselves as counterstereotypical in their personal advertisements (e.g., Bailey, Kim, Hills, & Linsinmeier, 1997; Rule & Ambady, 2008). To explore these possibilities, we compared inferences of women's sexual orientations from their personal advertisement photos with judgments of femininity and masculinity based on the contents of their advertisements.

Method

Forty-nine undergraduates participated in exchange for partial credit in an introductory psychology course. Twenty-one (Cronbach's $\alpha = .86$; $n = 12$ females) rated 197 photos of self-identified straight (98 photos) and lesbian (99 photos) women's faces drawn from the same source and prepared using the same procedures as in the studies above. The remaining 18 (Cronbach's $\alpha = .79$; $n = 9$ females) rated the contents of the advertisements. Instructions and procedures were similar to those above, however participants were asked to rate the women's probable sexual orientations along a 7-point scale from 1 ("Lesbian") to 7 ("Straight"; see Rule et al., 2008). Participants in the content-rating task were asked to indicate how feminine (1) to masculine (7) they believed the author of each advertisement was along a 7-point scale.

Results and discussion

Scores for each target were averaged across participants. Comparisons of the mean sexual orientation ratings for the self-identified lesbian women ($M = 4.35$, $SE = .13$) were significantly lower than those for the self-identified straight women [$M = 4.95$, $SE = .08$; $t(195) = 3.88$, $p < .001$] and sensitivity correlations (see Rule et al., 2008) showed that participants' accuracy in judging the sexual orientation from the faces was significantly better than chance: $\bar{r} = .18$, $SD = .06$, 95% CI = .16–.21.

Comparisons of the femininity/masculinity of the contents of the advertisements showed the opposite pattern. Lesbian women's advertisements ($M = 3.56$, $SE = .07$) were rated as significantly less masculine than were straight women's advertisements [$M = 3.30$, $SE = .07$; $t(195) = 2.46$, $p = .01$], consistent with previous research showing that individuals attempt to appear counterstereotypical in their personal advertisements (e.g., Bailey et al., 1997). Moreover, the relationship between participants' ratings of sexual orientation from the women's faces with the femininity/masculinity of the contents of their advertisements was negative but non-significant: $r(195) = -.12$, $p = .09$. This relationship did not substantially vary when controlling for the targets' actual sexual orientations or when examining the lesbian and straight women separately; r's = $-.06$ to $-.08$, p's > .26. Thus, the above studies are unlikely to have been influenced towards a Type-I error due to photo selection. Rather, the effects observed may more likely be underestimates because of a tendency towards Type-II errors. Additionally, these data may challenge stereotypes of lesbian women as masculine and straight women as feminine.

General discussion

Female sexual orientation can be judged accurately, rapidly, and automatically from perceptions of the face and its features. In Study 1, we found that women's faces provided sufficient information to allow perceivers to accurately discern their sexual orientation and that even judgments based just on women's eyes, without brows or "crow's feet" wrinkles, were accurate at levels significantly greater than chance. In Study 2 we found that judgments of women's faces were highly efficient by showing that accuracy was significantly better than chance following exposures of just 40 ms. Finally, in Study 3 we found that judgments of female sexual orientation are likely to occur automatically by demonstrating that accuracy was significantly greater when based on snap judgments than when based on thoughtful and deliberated judgments.

These data speak to the robust capacity for extracting social information from faces. Unlike major social categories that possess very clear perceptual markers (e.g., age, race, and sex), the cues distinguishing sexual orientation are very subtle. Here we have gained insight as to what some of these cues may be. Even when controlling for cues that are stereotypically believed to distinguish lesbian women from straight women (such as makeup, hairstyle, emotional expression, and outer face shape), participants were still able to accurately judge sexual orientation from women's faces. Furthermore, participants were able to accurately judge sexual orientation from just women's eyes. Given that the targets did not significantly differ in the amount of makeup that they were wearing, that the brows were excluded from the images, and that the primary lateral contractions of the orbicularis oculi muscles were not visible, it is curious what cues from the eyes might be communicating information about sexual orientation. The image resolution of the stimuli in the current investigation precludes us from providing an answer but future work might be able to contribute further to our understanding of this effect.

These data also speak to the process by which these judgments may occur. In Study 2, brief perceptions—40 ms—of women's faces permitted accurate judgments of their sexual orientation. Thus, our ability to extract information about sexual orientation from women's faces is quite efficient. Recent work has shown similar efficiency for other judgments. For example, rapid judgments of competence from politicians' faces predict their electoral success (Ballew & Todorov, 2007) and rapid judgments of personality traits and facial attractiveness correspond to judgments made at longer durations (e.g., Bar, Neta, & Linz, 2006; Olson & Marshuetz, 2005). In addition to being efficient, in Study 3 we also found that

judgments based on first impressions of sexual orientation were more accurate than those based on deliberated, thoughtful impressions. Indeed, participants were significantly impaired in their accuracy when instructed to think carefully about their choices. These data therefore demonstrate that categorizations of female sexual orientation may be automatic (see Bargh, 1994) and that snap judgments of female sexual orientation may be more effective than when the judgments are carefully considered.

The benefits of unconscious over conscious thinking have been demonstrated for other social judgments, as well. For instance, Dijksterhuis and colleagues have shown that non-deliberative judgments can lead to better choices and have illustrated the many benefits of unconscious over conscious thought (e.g., Dijksterhuis et al., 2006; Nordgren & Dijksterhuis, 2009). Similarly, Ballew and Todorov (2007) found that judgments of politicians' faces were more predictive of electoral success when based on unreflective versus deliberated judgments (see also Levine, Halberstadt, & Goldstone, 1996). The current findings therefore extend these effects to the domain of person categorization.

This work also raises many questions. For instance, the current work employed only Caucasian women's photographs and is limited by its use of photos from dating websites. It is likely that most of the women posting advertisements for same-sex partners were not working to conceal their sexual orientation. Therefore, the discriminability of female sexual orientation may not extend to contexts in which the targets wish to pass as straight (see Goffman, 1963; Yoshino, 2006). Future research should seek to address these topics.

Similarly, it remains unknown what aspects of the face and its features may underlie these judgments. Are there particular qualities of the eyes and face that distinguish straight and lesbian women? One hypothesis would be that lesbian women's faces are somehow more masculine, whether by nature, nurture, or both; though the data relating judgments of women's faces to the content of their personal advertisements hint that this would not correspond to self-reports of their behavior. Nevertheless, previous work has shown that individuals use cues about gender-typicality in inferring others' sexual orientations from their body shape and gait (Deaux & Lewis, 1984; Johnson et al., 2007). Given that gender can be accurately determined from individual facial features (Brown & Perrett, 1993), future studies may wish to explore the role of gender typicality on the categorization of sexual orientation from faces and facial features. Additionally, exploration as to why female sexual orientation is legible from the face is also warranted. Although evolutionary arguments might support an adaptive role for discerning sexual orientation from nonverbal cues, there is much information that can be extracted from the face without a clear evolutionary advantage (see Zebrowitz, 1997). Thus, it is possible that the expression of sexual orientation from the face is merely incidental. At the moment, we are limited to speculation about why these judgments might be possible. Therefore, further research will be needed to understand this issue better.

Many of the effects that we observed in the current research are extensions of findings previously shown for judgments of male sexual orientation. However, the present work also contributes some unique insights into judgments of sexual orientation. First, the present studies employed a much larger stimulus set—more than twice the size of that used in previous work examining judgments of male targets. Second, Study 2 shows that female sexual orientation is accurately judged at a faster threshold than what was previously observed for male faces. Third, previous work did not test the effects of deliberation on judgments of male sexual orientation. Although this is not to say that the same effects would also emerge for male targets, it provides a step forward in understanding the efficiency of judgments of sexual orientation, in general. In conclusion, sexual orientation is perceived accurately, rapidly, and automatically from women's faces and deliberation and thinking too much seems to disrupt this ability.

Acknowledgments

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