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SPECIAL SECTION: THE PUZZLE OF SEXUAL ORIENTATION

# Perceptions of Sexual Orientation From Minimal Cues

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**Abstract** People derive considerable amounts of information about each other from minimal nonverbal cues. Apart from characteristics typically regarded as obvious when encountering another person (e.g., age, race, and sex), perceivers can identify many other qualities about a person that are typically rather subtle. One such feature is sexual orientation. Here, I review the literature documenting the accurate perception of sexual orientation from nonverbal cues related to one's adornment, acoustics, actions, and appearance. In addition to chronicling studies that have demonstrated how people express and extract sexual orientation in each of these domains, I discuss some of the basic cognitive and perceptual processes that support these judgments, including how cues to sexual orientation manifest in behavioral (e.g., clothing choices) and structural (e.g., facial morphology) signals. Finally, I attend to boundary conditions in the accurate perception of sexual orientation, such as the states, traits, and group memberships that moderate individuals' ability to reliably decipher others' sexual orientation.

**Keywords** Appearance · Behavior · Clothing · Gaydar · Sexual orientation · Social psychology · Voices

## Introduction

As a highly social species, much of human life consists of a series of interactions with other people. Though some of these have great depth and richness (e.g., relationships with family, friends, or partners), perhaps the most frequent encounters that one has with others are fleeting and relatively anonymous. For instance, walking down the street in a city or town, one is likely to pass tens of strangers. Although we might exchange glances, or even say hello, these interactions tend to constitute limited engagement. We likely underestimate the frequency of these interactions because they are less substantial, even though they may comprise the majority of our experiences with other people.

Yet these brief encounters show remarkable complexity regarding the social and cognitive processes that govern how they unfold and the consequences they may bear. For instance, sometimes these meetings may inspire a person to approach an individual to get to know him or her better. Other times, one may see a person and decide to flee. Many of the computations that lead to such actions occur outside of conscious awareness. Hence, people perceive and respond to others quickly and based on their initial impressions (Ambady & Skowronski, 2008). Indeed, within a fraction of a second, one must evaluate the reward or risk attached to another individual and then plan a response. Here, I specifically discuss how minimal information derived from nonverbal cues leads one to form impressions of others' sexual orientation, the degree to which these impressions are correct, and the value that reading this information can have for subsequent thoughts and behaviors.

## Social Categorization

People encode a vast amount of information when perceiving another person. For example, perceiving a person's emotional expression can clue one to his or her state or intentions, informing the question of whether to approach or avoid the individual. We make similar decisions based on less direct pieces of information, however, such as whether a person we see is a member

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of our own group (i.e., a potential ally) or not (i.e., a possible rival or foe). Accordingly, one's group memberships comprise some of the most basic and legible characteristics that people perceive. Particularly, individuals' ages, races, and sexes tend to be among the first things people notice about each other (Brewer, 1988; Macrae & Quadflieg, 2010). More important, perceiving these characteristics—even nonconsciously—can powerfully influence individuals' thoughts and behaviors without their knowledge or awareness (Bargh, Chen, & Burrows, 1996).

Although many groups are perceptually obvious (such as age, race, and sex; Macrae & Bodenhausen, 2000), most are not. Rather, a great number of the social groups to which a person belongs may be perceptually ambiguous or lack any revealing cues altogether. For instance, people's religious beliefs, political affiliations, and sexual preferences can meaningfully guide much of their behavior. Though these attributes may not be immediately obvious when first meeting someone, an emerging literature has demonstrated that each of these perceptually ambiguous social categories does, in fact, display telling cues (for review, see Tskhay & Rule, 2013).

Despite their ambiguity, people generally express intuitions that various purportedly nonobvious traits can be discerned. Of these, perceptions of sexual orientation are likely the best known. Popular lore abounds with examples of "gaydar"—the colloquial notion that one can reliably judge another's sexual orientation based on indirect cues. This common belief about the legibility of sexual orientation has been well reflected in mainstream media. For example, an episode of the situation comedy *Seinfeld* featured a plot centered around the concept of gaydar in 1993 (David, Seinfeld, Charles, Mehlman, & Cherones, 1993), the animated comedy sketch *The Ambiguously Gay Duo* has aired on television comedy shows since 1996 (Smigel & Sedelmaier, 1996), and various other television programs have depicted similar gay detection storylines as recent as an episode of the leading comedy *Fresh off the Boat* in 2015 (Khan, Huang, Smithyman, & Scanlon, 2015).

In these fictional examples, perceivers call upon a number of signals, such as clothing and jewelry, to distinguish gay from straight individuals. Although scientific studies support the validity of some obvious and intentional cues related to one's explicit appearance and style (like those featured and described in the popular media), the empirical research on gaydar has shown that people can derive reliable perceptions of sexual orientation from much subtler levels. Here, I will review the four basic areas in which gaydar research has accumulated: adornment, acoustics, actions, and appearance. In doing so, I will not only highlight the cues that contribute to these judgments but will also describe some of the processes and consequences of these perceptions that help to inform more general principles of human social perception, as well as some of the real-world consequences of construing individuals as gay and straight.

## Adornment

Several studies have shown that one's clothing and static appearance can serve as a basis for conveying sexual orientation. Notwithstanding the most obvious case of adorning oneself with political symbols, such as a Pride Rainbow, pink "persecution" triangle, or equals sign logo of the Human Rights Campaign, sexual minorities have historically used far subtler signs to communicate same-sex sexual interest. For example, men in the late nineteenth century wore green carnations in London and red ties in New York to signal their same-sex interest (e.g., Chauncey, 1994; McKenna, 2003), whereas lesbian women around the same time might dress in men's clothing (see Newton, 1984). The "cruising" culture of mid-20th century America similarly displayed handkerchiefs of different colors to not only communicate interest in same-sex behavior but also to indicate the specific sex acts in which they wished to engage, depending on the color and placement of the handkerchiefs on their bodies (e.g., Reilly & Saethre, 2013).

This overt signaling aside, other volitional cues in one's static appearance can indirectly reflect sexual minority status. For instance, Krakauer and Rose (2002) found that lesbian women tend to be larger than straight women, citing less concern among lesbian women with the traditional gender norms about dieting common among straight women in Western culture that suggests volitional changes in body size (see also Singh, Vidaurri, Zambarano, & Dabbs, 1999). Thus, an apparent rejection of traditional gender roles can convey gender nonconformity, leading to the impression that one identifies with a sexual minority group. Along those lines, Rosario, Schrimshaw, Hunter, and Levy-Warren (2009) found that many women would pointedly alter their appearance after coming out as lesbian. In addition to dispensing with traditional body image concerns, women were more likely to cut their hair short, change their style of clothing, and to cease, minimize, or taper their use of cosmetic products—all of which effectively masculinized their appearance. Similarly, but conversely, some gay men may seek to feminize aspects of their appearance, leading them to have thinner bodies and faces than straight men (Conron, Mimiaga, & Landers, 2010). Gay men also often distinguish themselves through the type of clothing that they wear (Carroll & Gilroy, 2002) and distinct "tribes" of gay men may don particular styles of clothing and grooming to signal their affiliation with subgroups within gay culture (e.g., "leather-men" and "bears"; see Hennen, 2008). Overall, gay men generally spend more money on their appearance (including cosmetics, such as fragrances) than do straight men (Rudd, 1996).

This theme of gay men presenting as more feminine than straight men, and lesbian women presenting as more masculine than straight women, occurs consistently across the expressive channels that people use to perceive sexual orientation. Such "gender inversion" dates back to some of the earliest theories

about homosexuality in multiple cultures and societies, such as Ulrichs's (1870/1997) accounts of "urnings" in 19th-century Germany, which characterized homosexual men and women as women and men "trapped" in the bodies of the opposite sex—akin to present-day conceptions of the experience of transgender individuals. Yet perceptions of sexual orientation are not always based on cross-gendered cues. One pronounced exception to this occurs in the domain of aural cues to sexual orientation.

### Acoustics

One of the most prolific areas of research on nonverbal cues related to sexual orientation involves differences in speech. A great number of studies have dissected the ways in which gay and straight people produce speech sounds across multiple languages (e.g., Sulpizio et al., 2015). These have ranged from examining the production of consonants (e.g., Crist, 1997), vowels (e.g., Rendall, Vasey, & Mackenzie, 2008), and overall pitch (e.g., Gaudio, 1994), among others (see Munson & Babel, 2007, for review). One sound studied quite extensively is the consonant /s/, particularly with regard to its historically stereotypical connection to lisping behavior in gay men (Mack & Munson, 2012). For example, Van Borsel et al. (2009) found gay men more likely to lisp than straight men. Although Munson (2010) raised issues with their design, other studies (e.g., Mack & Munson, 2012; Van Borsel & Van de Putte, 2014) concur that people at least show high consensus about the perception that gay men lisp more than straight men do.

Indeed, people possess strong stereotypes about how gay people sound even if they do not always accord with their actual group membership (e.g., Smyth, Jacobs, & Rogers, 2003). For instance, an analysis of North American television shows found that male actors feminized their voices along a number of dimensions when playing gay characters, suggesting that people share common notions that sexual minorities differ from heterosexuals in the way that they speak (Cartei & Reby, 2012). Despite mere consensual opinions about how gay and straight people sound, other studies have suggested that gay and straight people actually do speak differently (e.g., Linville, 1998; see also Valentova & Havlíček, 2013). However, pinning down the precise parameters that account for these differences has proved elusive. The debate over whether specific cues in speech really do reveal differences in perceptions of sexual orientation aside, there appears to be a potentially robust signal in speech that can convey one's sexual orientation in many cases.

### Actions

Anecdotally, people tend to think of nonverbal behavior (gaydar cues included) as consisting of movements made with one's body or limbs. Not surprisingly, then, the first empirical work assessing accuracy in the perception of sexual orientation examined clips of gay and straight people captured in video. Berger, Hank, Rauzi, and Simkins (1987) presented study participants with six video recordings of gay and straight men and women (24 in total) and concluded that they could not correctly identify their sexual orientations. However, Hallahan (1998, as cited in Ambady, Hallahan, & Conner, 1999) found an error in their data analysis, which led to the opposite conclusion: sexual orientation *had* been legible from the videos. Ambady et al. took this a step further by presenting individuals with videos of straight and sexual minority targets but for only very brief segments (no more than 10 s). They found that the perceivers' ratings of the targets' likely sexual orientation using a modified Kinsey scale significantly correlated with the targets' own self-reported Kinsey scores. Moreover, diminishing these clips by presenting only still frames from the video and by removing all but the outlines of the targets' shape continued to permit statistically significant levels of accurate perception.

Rieger, Linsenmeier, Gygax, Garcia, and Bailey (2010) followed up on this work by repeating Ambady et al.'s (1999) study with new stimuli, finding that holistic judgments of the targets' sex atypicality explained much of participants' accuracy. Similarly, Johnson, Gill, Reichman, and Tassinary (2007) decomposed the aspects of individuals' body movement that lead to accurate perceptions of sexual orientation. Specifically, they created computer-generated avatars of bodies and varied whether they "swaggered" their shoulders or "swayed" their hips. They then crossed these movements with the waist-to-hip ratios of the figures so that they resembled either an hourglass figure (typical of women) or a tubular figure (more typical of men). Like Rieger et al., they found that people perceived avatars with a male body type as straight when swaggering their shoulders but as gay when swaying their hips. Conversely, participants perceived avatars with the feminine hourglass-like figure as straight when swaying their hips and as lesbian when swaggering their shoulders. More impressive, Johnson et al. also recorded the movements of actual gay and straight men and women walking on a treadmill in the laboratory, measuring the extent to which they swaggered their shoulders and swayed their hips. Consistent with participants' perceptions of the avatars, gay men and straight women swayed their hips more, whereas straight men and lesbians were more likely to swagger their shoulders. In a follow-up study, Lick, Johnson, and Gill (2013) presented participants with point-light displays of moving bodies visible only as a series of dots affixed to the body's major joints (e.g., knees, hips, shoulders, and elbows). These point-lights look like nothing more than an array of dots when static but, once moving, perceivers can quickly recognize human forms through their patterns of action (see Johansson, 1973). Lick et al. found that people could accurately infer men's but not women's sexual orientation from such point-light displays and concluded that women could conceal their sexual orientation more effectively when walking in a gender atypical manner than men could.

Not only does gender atypical behavior thus serve to describe the sexual orientations of adults, one study showed that it also

helps to forecast the later sexual orientation of children. Rieger, Linsenmeier, Gygax, and Bailey (2008) solicited home movies from gay and straight adults and presented segments of them to participants. Ratings of the children's movement in the videos revealed that children who later grew up to be gay or lesbian moved their bodies in sex-atypical ways; that is, boys who seemed feminine in a holistic sense later grew into gay men and girls who seemed masculine overall later grew into lesbian women (see also Coyle, Fulcher, & Trübutschek, 2016). These findings suggest that the cues expressing sexual orientation may manifest early in life for many individuals. Moreover, people may reveal their sexual orientation through their actions even when attempting to conceal it (see Sylva, Rieger, Linsenmeier, & Bailey, 2010). The perception of sexual orientation may therefore rely on some basic elements. Subsequent work has attempted to map out just how basic some of the cues to sexual orientation might be.

## Appearance

Ambady et al. (1999) found that still frames of video of gay and straight individuals allowed others to discern their sexual orientation at rates significantly greater than chance guessing. This suggests that perceivers can extract information about sexual orientation from a person's static appearance, raising questions about what those cues might be. Morphological differences between sexual minorities and heterosexuals obviously may contribute to this. In addition to the behavioral differences that seem to lead gay men to be lighter and lesbian women to be heavier, reviewed as aspects of adornment above, developmental hormones may also provoke straight men and lesbians to grow taller than gay men and straight women, respectively (Bogaert, 2010). Similar mechanisms may underlie the observation that gay men tend to have shorter limbs than straight men, whereas lesbian women tend to have longer limbs than straight women (relative to their body's trunk; Martin & Nguyen, 2004). The greatest amount of nonverbal information about a person arguably comes from his or her face, however (for review, see Re & Rule, 2015).

Although the face occupies a small spatial area relative to the rest of the body, it contains tens of small muscles that allow it to move and change far more dynamically (Netter, 2003). Faces also occupy a special place in interpersonal perception and communication (see Rinn, 1991). Neuroimaging studies suggest that the human brain has specialized mechanisms to process the faces of other people (e.g., Moscovitch, Winocur, & Behrmann, 1997) and, concomitantly, the face tends to be the primary target of attention when one encounters another person (e.g., Palermo & Rhodes, 2007). As a result, the face is possibly the richest source of social information about a person, ranging from what he or she may be thinking (e.g., Baron-Cohen, Wheelright, & Jolliffe, 1997) to what his or her life experiences might have been (Malatesta, Fiore, & Messina, 1987). It is logical, then, that the face could potentially contain cues to sexual orientation, and several studies have endeavored to describe the ways in which this might occur.

In one test of this, Rule and Ambady (2008) showed study participants photos of the faces of gay and straight men for differing periods of time. Some participants viewed the faces at their own pace (1.5 s, on average), categorizing each one as either gay or straight. Other participants performed the same task but could only view the faces for a quick flash: either 1/10th, 1/20th, or 1/30th of a second. Finally, others were forced to view the faces for a longer period of time before deciding (6.5 or 10 s per face), although participants in all conditions were instructed to categorize the faces using their "gut instinct." Results showed that the participants categorized the men's sexual orientations significantly better than chance guessing in all conditions except when viewing the faces for just 1/30th of a second, a duration at which the faces' visibility was only subliminal. Moreover, their accuracy did not significantly change or improve with additional viewing time; rather, participants' accuracy when viewing faces for 1/20th of a second was statistically equivalent to those who viewed the faces for 10 s. Thus, people's judgments of men's sexual orientation were similar regardless of whether they saw the person's face for 50 ms or for as long as they liked.

## Automatic Processing

The speed with which individuals capture information about targets' sexual orientation suggests that people may make such judgments automatically. Similar to processing perceptually obvious groups, which occurs instantly upon perceiving a person (see Macrae & Quadflieg, 2010), might subtler group distinctions like sexual orientation proceed automatically as well? Several studies formally tested this question, suggesting that the same cognitive machinery employed to assess a person's age, race, or sex might also function to compute his or her sexual orientation. For instance, although Rule and Ambady (2008) instructed all of their participants to make "snap judgments" about the men's sexual orientations regardless of viewing time, Rule, Ambady, and Hallett (2009a) asked participants to deliberate about their decisions before rendering a categorization. Similar to the way in which thinking about the automatic process of shifting gears in traffic can undermine one's ability to effectively drive a car, deliberation about cognitive tasks can also disrupt the successful execution of a process. Thus, they found that instructing participants to deliberate about their judgments of women as straight or lesbian caused them to perform at chance levels, whereas participants assigned to make their judgments quickly suffered no such decrement. This interference suggests that people may evaluate sexual orientation automatically (see Bargh, 1994).

Moreover, capitalizing on the well-developed literature describing ingroup effects in memory, Rule, Ambady, Adams, and Macrae (2007) tested how gay and straight men might

attend to (and thus encode) the faces of their gay and straight counterparts. Consistent with previous research in which people's memory for others who share their age (Wright & Sladden, 2003), race (Meissner & Brigham, 2001), and sex (Wright & Stroud, 2002) exceeds that for people who do not (for review, see Young, Hugenberg, Bernstein, & Sacco, 2012), gay men displayed slightly better memory for men they believed to be gay, whereas straight men showed substantially better memory for men they perceived as straight. This suggests that the perceivers may have truncated their cognitive processing of outgroup members' faces upon deciding that they were gay or straight (see Rodin, 1987), which (as sexual orientation was not mentioned to the participants in the study before they perceived the faces) would mean that they had encoded the targets' sexual orientations incidentally and without intention.

A third study provided more direct evidence for the automatic categorization of sexual orientation, however. Rule, Macrae, and Ambady (2009b) asked participants to complete a lexical decision task in which their only chore was to classify strings of letters as words or nonwords. Half of the words they presented corresponded to concepts stereotypically associated with straight men (e.g., football), whereas the other half corresponded to concepts associated with gay men (e.g., rainbow). Critically, prior to the presentation of each string of letters, they quickly flashed photos of the faces of gay or straight men. On average, participants categorized gay-related words significantly faster when preceded by a gay man's face (vs. a straight man's face) and categorized straight-related words significantly faster when preceded by a straight man's face (vs. a gay man's face). This facilitation in processing the words *as words* according to the happenstance presentation of the faces suggests that the faces triggered the participants to think about gay and straight concepts, respectively, consistent with cognitive models of "spreading activation" (e.g., Collins & Loftus, 1975) in which cognitions about one subject (here, a gay or straight face) activate cognitions about related subjects (e.g., stereotypes about gay and straight men).

## Facial Features

Consistent with the potentially automatic nature of sexual orientation judgments, participants in many of these tasks expressed low levels of confidence in their ability to accurately perceive others' sexual orientation. The prevalence of lay beliefs about gaydar notwithstanding, many of the participants in Rule and colleagues' experiments emerged distraught and discouraged about their performance. This defied their displayed levels of accuracy, however. Thus, the researchers explored what features of the face might account for perceivers' accurate judgments and formally measured the participants' insight about their performance.

Accordingly, Rule, Ambady, Adams, and Macrae (2008) cropped men's faces to show only their eyes, mouths, or hairstyles and asked participants to rate how accurate they thought they had been in judging the faces' sexual orientations after they made their categorizations (see Tskhay, Feriozzo, & Rule, 2013, for similar work examining women's faces). Participants' accuracy levels again exceeded chance guessing for all three conditions. Notably, participants more accurately judged the men from their hairstyles (a static, stylistic cue—see the Adornment section, above) than from the eyes or mouth. Moreover, participants' perceptions of their accuracy in judging men's sexual orientation correlated with their actual performance only when judging their hairstyles but not for judgments of their eyes, mouths, or the combination of all three features via the full unaltered face. In addition, removing these features by showing only the center of the face with the eyes and mouth covered did not lead to accurate categorizations (and participants still lacked insight about those judgments as well). This underscores the importance of these particular features (though the arrangement, or configuration, of the face's features may be important as well; see Tabak & Zayas, 2012), suggesting that perceivers may *knowingly* employ some cues when judging sexual orientation (such as stylistic cues, which individuals likely use to actively express their sexual orientation) but *unknowingly* extract information from others.

Although the finding that specific facial features as minimal as the eyes contain information sufficient to accurately judge men's and women's (see Rule et al., 2009a) sexual orientation is intriguing, these results leave undescribed what about the nature of the face allows perceivers to decrypt an individual's sexual orientation. Subsequent research has therefore attempted to answer this question. For instance, a study by Valentova, Kleisner, Havlíček, and Neustupa (2014) found that the shape of gay men's faces differs from that of straight men's faces in several ways that correspond to more feminine and babyish facial features (see Berry & McArthur, 1985). Similarly, Hughes and Bremme (2011) found gay men to have less symmetrical faces than straight men in one cohort of targets, and Freeman, Johnson, Ambady, and Rule (2010) manipulated the facial structure of men's and women's faces to show that gender atypical combinations of facial shape and skin texture led to attributions of individuals as homosexual. More recently, Skorska, Geniole, Vrysen, McCormick, and Bogaert (2015) elaborated upon these physiognomic differences by demonstrating that men's and women's faces differed according to their sexual orientation along a variety of physical parameters. For instance, gay men had shorter and rounder noses than straight men, and lesbian women had mouths and noses that were turned or tilted up. In most cases, the differences in facial structure showed evidence of sex atypicality (i.e., more masculine features in lesbian compared to straight women and more feminine features in gay compared to straight men).

Gender inversion may thus again provide critical cues for accurately perceiving sexual orientation. However, it may manifest in more than static facial structure. For example, Tskhay and

Rule (2015a) found that the ephemeral facial cues provided by emotional expressions can direct judgments of sexual orientation over and above perceptions of gender atypicality and other indicators of facial structure. Consistent with the stereotype linking gayness to happiness, and the relationship between positive facial expressions and femininity (e.g., Hess, Adams, & Kleck, 2005), people envisaged gay men as displaying happier facial expressions than straight men. In addition, computationally manipulating faces to appear happier increased perceptions of individual targets as gay. Thus, subtle cues to emotional expression in targets' eyes could account for the perception that they are gay. Yet emotionally neutral faces also allow for accurate judgments of sexual orientation (see Stern, West, Jost, & Rule, 2013, 2014). Moreover, recent work showed that the sexual orientations of gay men with greater levels of internalized homophobia were less legible from neutral photos of their faces compared to gay men more comfortable with their sexual orientation, adding to the possibility that ephemeral and experiential factors may contribute to the efficacy with which sexual orientation is perceived (Tskhay & Rule, 2015b). Additional work is necessary, then, to fully account for how individuals come to convey their sexual orientation through their face and to better integrate the contributions of static (e.g., structural) and dynamic (e.g., expressive) cues.

### Differences Between Perceivers

Targets' contributions to how perceivers infer their sexual orientation is only one half of the equation that leads to a judgment. A series of studies has focused alternatively on the conditions and characteristics of the people making judgments of sexual orientation and, specifically, how such factors might impact their accuracy. For example, people who express higher levels of anti-gay prejudice perform worse in judging sexual orientation (Rule et al., 2015), whereas people more familiar with gay men perform better but have less confidence about their judgments (Brambilla, Riva, & Rule, 2013). Along these lines, sexual minorities may show better accuracy in judging others' sexual orientation from faces (e.g., Johnson & Ghavami, 2011; Rule et al., 2007; but see also Lyons, Lynch, Brewer, & Bruno, 2014) but show only a small and inconsistent advantage for judgments based on other channels (e.g., speech, movement), including appearance beyond the face (Ambady et al., 1999; Berger et al., 1987, as cited in Ambady et al., 1999; Rieger et al., 2010).

Individuals' states or dispositions can also influence their accuracy. Rule, Rosen, Slepian, and Ambady (2011b) found that heterosexual women judged men's (but not women's) sexual orientation more accurately the closer they were to the peak of their ovulatory cycle (when conception opportunities are the greatest). Their motivation to attend to potential mates seemed to be responsible for this, as women primed with thoughts about mating performed significantly better in judging men's sexual orientation than women who were not primed to think about mating did.

Separate research has shown that people's political beliefs can also influence the way in which they judge sexual orientation. Although they did not differ in the accuracy of their judgments, Stern et al. (2013) found that political conservatives were more likely than politically liberal individuals to use gender atypical features to judge men's sexual orientation. Thus, politically conservative individuals categorized feminine-appearing men as gay more often than politically liberal individuals did. Although both groups recognized gender atypicality as a cue to sexual orientation, conservatives employed this strategy routinely, whereas liberals appeared to instigate but then correct their use of the gender inversion stereotype.

Group differences can similarly affect accuracy in judging sexual orientation. Valentova, Rieger, Havlíček, Linsenmeier, and Bailey (2011) found that American and Czech participants judged the sexual orientation of people from their own culture somewhat better than targets from the other's culture based on brief video clips. Similarly, Rule, Ishii, Ambady, Rosen, and Hallett (2011a) tested American, Japanese, and Spanish participants' judgments of the sexual orientation of American, Japanese, and Spanish targets from photos of their faces. Perceivers from all three nations categorized sexual orientation significantly better than chance guessing for targets from all three nations. Although American participants showed the best accuracy overall, Spanish participants were significantly more likely to be willing to categorize targets as gay—perhaps because Spain is the most progressive of the three countries regarding rights for sexual minorities.

Similar to the relatively equivalent accuracy of judgments across cultural lines, Rule (2011) reported that Asian, Black, and Caucasian participants all performed equally well in judging the sexual orientation of all of Asian, Black, and Caucasian men. Similarly, Johnson and Ghavami (2011) tested perceptions of sexual orientation for individuals of different races, finding evidence for racial differences that varied according to the target's sex. Specifically, perceivers judged sexual orientation more accurately when stereotypes about the groups' masculinity and femininity matched the target's sex (i.e., Asian women and Black men) because deviations from gender typical appearances appeared more salient. Complementarily, individuals belonging to groups for whom stereotypes of masculinity and femininity contrasted with their sex (i.e., Asian men and Black women) were more likely to be judged as gay and lesbian.

Finally, although most studies have examined judgments of sexual orientation dichotomously, a growing supply of evidence underscores that sexual orientation is rarely so discrete (e.g., Vrangalova & Savin-Williams, 2012). Notably, some studies on the perception of sexual orientation have treated targets' sexual orientation as a continuum (e.g., Ambady et al., 1999). However, even in that work, most of the targets tended to score at the heterosexual and homosexual endpoints of the scale. One study,

however, explicitly addressed the question of perceptions of people identifying as bisexual. Ding and Rule (2012) found that perceivers could reliably categorize gay and straight men according to their sexual orientations but could not accurately distinguish bisexual men (but see also Lick, Johnson, & Rule, 2015). Expounding upon this, perceptions of sexual orientation using a continuum, rather than three discrete category options, showed that people perceived gay and bisexual men (and lesbian and bisexual women) as similar to each other and roughly equally distinct from the straight targets. This suggests that perceptions of sexual orientation seem to follow a dichotomy of straight (the default categorization) versus not straight.

## Consequences

Despite the value afforded by knowing that people express their sexual orientation in myriad ways and that others can perceive it, perhaps more valuable is understanding what people might do with this information. Naturally, homophobia and anti-gay prejudice represent palpable threats to the well-being of sexual minority individuals (e.g., Herek, 2004). Identifying a person as a sexual minority could therefore place him or her in danger and several studies have shown that minimal cues to sexual orientation can motivate prejudice against sexual minority individuals (e.g., Lick & Johnson, 2014; Lick, Johnson, & Gill, 2014). Though some studies have shown that disclosing oneself as a sexual minority may sour interactions with new acquaintances because it biases their views toward stereotypes (Buck & Plant, 2011; see also Knöfler & Imhof, 2007), others have found that attempting to conceal one's sexual minority status can undermine performance across multiple domains (Everly, Shih, & Ho, 2011).

Given that people are often ineffective in concealing their sexual orientation (Sylva et al., 2010), that perceivers appear to encode sexual orientation without conscious knowledge or intent (e.g., Rule et al., 2009b), and that perceptions of sexual orientation from minimal cues can persist despite perceivers' opposing knowledge (Rule, Tskhay, Freeman, & Ambady, 2014), it may be critical to understand the impact that subtle perceptions of sexual orientation may exert. Rule, Bjornsdottir, Tskhay, and Ambady (2016a) found that perceptions of men's sexual orientation may confine their employment opportunities to stereotypically appropriate professions (e.g., engineers vs. nurses). More important, these limits emerge even among experienced human resources professionals and when sexual orientation is never explicitly mentioned. Although these findings suggest that minimal cues to sexual orientation can meaningfully affect individuals' life outcomes, little research has connected the literature on perceptions of sexual orientation to their manifestation in the world outside of the laboratory. Future work should direct resources toward this effort.

## Criticisms

Consistent with these limitations, some scholars have recently raised questions about the validity of research on perceptions of sexual orientation. Plöderl (2014) noted that most studies on the accurate judgment of sexual orientation have, to date, used stimulus samples that do not reflect the actual base rates of gay and straight individuals in society. Thus, Plöderl argued that the actual rates of accuracy, based on the experimental results reported by others, would be much lower if one accounts for the true ratio of gay:straight people in the real world (see also Olivola & Todorov, 2010).

Although they acknowledged the importance of this "base rate neglect" (see Tversky & Kahneman, 1974), Bruno, Lyons, and Brewer (2014) pointed out critical statistical and conceptual errors in Plöderl's (2014) arguments. For instance, the conditions of the studies reviewed above were not designed to simulate interactions in the real world. Judging a person's sexual orientation based on a tightly cropped grayscale photo of his or her eyes, for example, does not seek to answer the question of how often such a judgment occurs in real life but, rather, to understand the boundaries under which sexual orientation may be legible. Experimenters accordingly constrain the context of judgments in their laboratories to isolate phenomena and these constraints in the service of internal validity rarely mimic all of the conditions of daily life. Though many perceivers would not routinely encounter a lot of sexual minority individuals in most parts of the world (noting, of course, that the number and visibility of sexual minority individuals living in a particular country, town, or neighborhood can vary dramatically), they would typically enjoy far more information upon which to make their judgments than has been offered by researchers conducting investigations in their laboratories. The rates of accuracy provided by the present literature may therefore represent underestimates of individuals' true ability to perceive sexual orientation (see Tskhay & Rule, 2013).

A second critique has suggested that studies measuring perceptions of sexual orientation based on photographs of faces in particular contain a systematic stimulus confound. Cox, Devine, Bischmann, and Hyde (2016) tested participants' judgments of sexual orientation from photos of men and women that they downloaded from personal advertisements (a method common in studies of sexual orientation from facial cues; e.g., Rule et al., 2009a). In their photo sets, gay men and lesbian women had posted higher quality photos than had straight men and women, respectively. When accounting for this difference using sub-samples of their photos equated for quality across the sexual minority and heterosexual groups, Cox et al. found that rates of accuracy did not differ from chance. They took this as evidence that all studies testing perceptions of sexual orientation from photographs contain the same flaw. However, this fails to explain how multiple studies that have used photos

taken under standardized conditions in the same laboratory continue to find similar levels of accuracy as those culled from dating websites. Moreover, this finding does not apply to photos downloaded from websites where the targets did not choose their own photos (e.g., Rule & Ambady, 2008; Rule et al., 2008). Finally, a systematic test of over 6000 images of sexual minority and heterosexual targets used in research on the accurate perception of sexual orientation from photos spanning 61 published studies by Rule, Johnson, and Freeman (2016b) found no evidence for any systematic differences that agreed with those reported by Cox et al. Thus, image quality differences do not seem to plague the facial photos used in the studies reviewed here; this confound may be isolated to the stimuli used by Cox et al.

More important, arguments about the methodological details of the conditions under which laboratory participants have judged sexual orientation fail to acknowledge separate studies that have documented legitimate differences in adornment, acoustics, actions, and appearance. Epidemiological studies have shown that straight and sexual minority individuals significantly differ in body size (e.g., Krakauer & Rose, 2002), phonetic analyses have found differences in how heterosexual and sexual minority individuals produce sounds (e.g., Crist, 1997), coding body movements and postures has demonstrated that straight and sexual minority individuals move and behave differently (e.g., Knöfler & Imhof, 2007), and objective measurements of appearance have shown that straight and sexual minority individuals differ in their facial features (e.g., Skorska et al., 2015). Although the research on perceptions of sexual orientation from minimal cues has limitations, the preponderance of evidence measuring the accuracy of these perceptions suggests that differences do exist and that individuals can reliably distinguish them. Moreover, the research on the automaticity of perceptions sexual orientation suggests that people *do* perceive these differences, and without provocation. The rates of identifying someone as a sexual minority may vary depending on the context and norms of a particular environment, as Plöderl (2014) and Cox et al. (2016) might suggest, but this is not to say that meaningful signals about sexual orientation do not exist across the channels reviewed above, or that people are not sensitive to these signals when systematically tested on their ability to perceive them. Indeed, considering the volume of ways in which gay men and lesbians may differ from their heterosexual counterparts, the fact that perceivers can detect some of them is almost unremarkable.

## Conclusions

Human life typically consists of almost constant interactions with other people. Whether seeing someone on the street, speaking with someone on the phone, or watching a person on television, we regularly encounter other people. Because of the salience of these interactions and the meaning they imbue for our survival and well-being, this repeated exposure to other people can be overwhelming. The mind has therefore developed various tools to help us drink from this fire hose of social information. One method is to sort people into salient categories immediately upon perceiving them. Sexual orientation appears to be one such salient dimension that we use to simplify the social world.

Here, I have reviewed some of the congregate evidence demonstrating that straight and sexual minority individuals differ in how they adorn themselves, how they speak, how they act, and how they look. Aside from overt sexual signaling (Nicholas, 2004; see also Mason, Tatkow, & Macrae, 2005), these differences may be subtle. Yet minimal cues in each domain seem to support accurate judgments of sexual orientation. Although no studies have examined the accuracy of differences based on adornment (where the cues to sexual orientation are explicit, intentional, and may thus be obvious so long as one knows the code), reanalysis of the data from a recent meta-analytic review of perceptions of sexual orientation and other social groups indicates that actions ($M = 64\,\%$, $SD = 8\,\%$), acoustics ($M = 63\,\%$, $SD = 18\,\%$), and appearance ($M = 62\,\%$, $SD = 9\,\%$) lead to similar levels of accuracy for judgments of sexual orientation (but may be conservative estimates; see Tskhay & Rule, 2013). Though far from perfect, these values exceed chance guessing (i.e., 50 %) and can have important consequences for social interactions and life outcomes (despite the usual limitations that come with generalizing laboratory tests to events in the real world). Thus, although the public does not typically consider sexual orientation minority individuals a "visible minority," the bulk of scientific evidence suggests that people are sensitive to differences in sexual orientation and can reliably perceive it based on minimal nonverbal cues.

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**Compliance with Ethical Standards**

**Ethical Approval** This article does not contain any studies with human participants or animals performed by the author.

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