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Disentangling Gender-Based Attitudes from Sexuality-Based Attitude: The Person-Based Approach to Measuring Implicit Attitudes Toward Gay Men and Lesbian Women

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ABSTRACT

In this paper, we present the person-based approach to measuring implicit attitudes toward gay men and lesbian women—this approach uses face stimuli rather than traditionally used symbols, and creates salient social categories through contextual variation techniques. Across 5 experiments using the Go/No Go Association Task ($n = 364$), we present evidence that the person-based approach can disentangle implicit gender-based attitudes from implicit sexuality-based attitudes, that these attitudes vary as a function of participant gender and sexuality, and that they are different to attitudes elicited by typically used stimuli. We demonstrate that implicit person-based *gender* attitudes toward straight and gay people are similar and are consistent with the literature (i.e. attitudes toward [lesbian] women are more positive than attitudes toward [gay] men). However, we reveal a reversed pattern of findings for person-based implicit *sexuality* attitudes (i.e. attitudes toward gay men are more positive than attitudes toward lesbian women). These findings suggest that the person-based approach uniquely captures nuanced implicit attitudes toward gay men and lesbians, raising important questions regarding previous findings.

The social category of GAY is somewhat unique in that this category is inextricably entangled with the related, but more perceptually salient, category of gender. For example, a gay female can be classified as gay, as female, or the intersection of the two (i.e., a lesbian woman). Given that sexuality cannot be reliably identified by visual cues (Freeman et al., 2010),[1] but gender can, this poses a stimuli selection problem for research in which gay men or lesbians need to be represented visually, as is the case in measures of implicit attitudes (i.e., measures of association that do not rely on self-report, and are argued to

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measure constructs that are beyond the realm of conscious control; see Fazio & Olson, 2003).

Researchers of implicit attitudes toward gay men and lesbians typically represent the target category of gay with pictorial representations, such as symbols that represent that category or pictures of same-sex couples or same-sex weddings. As we will argue, this can be problematic in its own right as it confounds the issue of attitudes toward GAY PEOPLE with (what we will argue is) the superordinate construct of attitudes toward the social category of GAY. Perhaps more importantly, these typical methods of representation (we shall refer to as category-based) do not allow the attitudes toward the target's gender to be isolated from the attitudes toward the same target's sexual orientation. This leaves researchers in the field of research into implicit sexuality attitudes to grapple with the question of how best to measure attitudes toward gay people (assuming this is their aim), and how to ensure that their sexual orientation is not eclipsed by the typically more salient social category of their gender.

The main aim of this paper is to present initial evidence for the person-based approach to implicit representations, which will provide researchers with an alternative to existing paradigms in measuring implicit attitudes toward sexual orientation. This approach uses faces of gay individuals in addition to using contextual variation techniques (based on the work of Mitchell et al., 2003) to isolate the social category of the attitude-object under evaluation (i.e., to isolate the target's gender from its sexual orientation). We will do this using two distinct sets of stimuli—the first will use famous faces (i.e., celebrities who have a famous sexual identity) and thus the participants will be aware of the sexuality of the stimuli, and the second will use unknown faces for which the participants will go through a "learning phase" to acquire knowledge of the sexuality of the stimuli. In using this approach, we are aiming to assess a very specific version of attitudes toward gay men and lesbian women—that is, one that is person-based and sexuality-specific (while purposefully isolated from the attitudes toward their gender). We believe this approach to be important, as it is arguably higher in ecological validity and thus makes the findings more meaningful—to be specific, in the world gay men and lesbian women are evaluated and differentially treated on the individual level based on how they present. While category-based attitudes are still important, we argue that they are measuring a different type of attitude that might not reflect how an individual gay or lesbian person is evaluated or treated when interacting with others.

We base our work on the existing literatures in implicit gender attitudes and implicit sexual prejudice (i.e., usually negative automatic attitudes toward gay men and women; Banse et al., 2001), but inform our rationale with the often ignored concept of multiple-categorization (e.g., Crisp & Hewstone, 2007). While the literature consistently shows that category-based attitudes toward

gay men and lesbian are negative compared to attitudes toward straight men and women (i.e., sexual prejudice), we derive our hypotheses for person-based attitudes from implicit inversion theory (Kite & Deaux, 1987). This theory, derived from classic theories of sexuality (e.g., Ellis, 1915; Freud, 1953), suggests that gay individuals are often attributed characteristics that are more alike straight individuals of the opposite gender than their own gender (i.e., gay men are perceived as being more similar to straight women than straight men, and lesbians are perceived as being more similar to straight men than straight women). By extension, this suggests that attitudes toward a gay person might be more similar to attitudes toward their opposite gender counterpart than their same-gender counterpart (i.e., attitudes toward gay women might be more similar to attitudes toward straight men than toward straight women, and attitudes toward gay men might be more similar to attitudes toward straight women than toward straight men). This theory, in combination with growing literature demonstrating the differential impacts sexuality, gender, and gender expression in sexuality-based intergroup relations (Falomir-Pichastor et al., 2019; Iacoviello et al., 2019; Valsecchi et al., 2020), further highlights the usefulness of a methodology that could disentangle attitudes based on gender from attitudes based on sexual orientation.

Stimuli selection issues in measure implicit sexual prejudice

The measurement of implicit sexual prejudice is challenging. In contrast to implicit attitudes toward other social categories, such as gender or ethnicity, there are no reliable visible cues to indicate an individual's sexual orientation (Freeman et al., 2010). For example, in the measurement of implicit attitudes toward ethnic groups, researchers can use pictures of group members as stimuli (e.g., black vs white faces; Dasgupta et al., 2000), and gender can be represented by faces, category-relevant names, or even pronouns like SHE vs. HE (Greenwald et al., 1998). However, being gay is neither visually apparent nor uniquely associated with category names. As a consequence, researchers interested in measuring implicit sexual prejudice have used category-based stimuli—a variety of word stimuli (e.g., words directly associated with the social category including GAY and LESBIAN; Steffens, 2005; Steffens & Buchner, 2003) or pictorial stimuli (e.g., gay wedding cake toppers, rainbow flag, same-sex couples kissing: Anderson & Koc, 2015; Breen & Karpinski, 2013; Moor et al., 2019; Salvati et al., 2021; Westgate et al., 2015), or a combination of words and pictures (Anselmi et al., 2013, 2015) that are representative of (or associated with) the construct of GAY. We argue that category-based representations may measure more than simple attitudes toward gay people.

Attitudes toward the category of GAY (and associated attitude-relevant constructs, such as gay marriage, same-sex behavior, etc.) are conceivably

different to attitudes toward an individual who happens to be gay. Category-based attitudes are likely to be socially entrenched (see Herek, 2004), and based on notions of value violations and deviance from societal expectations. As such, if person-based attitudes toward gay people can isolate attitudes toward the gay person from attitudes toward aspects of the social category, then person- and category-based attitudes should be qualitatively different to each other. Findings which stem from the contact hypothesis literature (i.e., prejudice reduction as a function of a conditional contact between majority and minority group members; Allport, 1954) would provide evidence that attitudes toward *gay people* may be different to attitudes toward the category of *gay* (Smith et al., 2009). For example (Herek & Capitanio, 1996), conducted a large scale probability survey to explore attitudes toward gay men and lesbians, and found that frequency of contact with gay individuals led to a significant reduction in reported anti-gay attitudes. They also highlighted the importance of disclosure as a feature that could facilitate negative attitude reduction. Thus, contact hypothesis effects could influence person-based attitudes, but might not extend to related, but superordinate, category-based attitudes.

Implicit sexual prejudice research measures associations between attributes (e.g., good or bad) and the category "gay" represented by visual symbols (e.g., ♂♂), mainly by using the Implicit Association Test (IAT; Greenwald et al., 1998). Banse et al. (2001) were the first to use the IAT to measure implicit sexual prejudice. They asked a sample of straight and gay participants to complete an IAT that used color photographs of two people standing side-by-side (full length). The category of straight was represented using 10 pictures of opposite-sex couples, and the category of gay (i.e., a mixture of gay men and lesbians) was represented using 5 pictures of pairs of men and 5 pictures of pairs of women (none of the couples were depicted in romantic positions). Participants were asked to classify targets (e.g., GAY and HETEROSEXUAL) and paired attributes (e.g., POSITIVE/PLEASANT and NEGATIVE/UNPLEASANT) as quickly as possible using two keys. The researchers of this study hypothesized that individuals harboring implicit anti-gay attitudes would have shorter response latencies in blocks using the targets GAY-NEGATIVE and HETEROSEXUAL-POSITIVE than in blocks using the targets GAY-POSITIVE and HETEROSEXUAL-NEGATIVE. The results of this study revealed the expected IAT effect from straight male and female participants, but not gay male or lesbian participants, and this was taken as evidence of the measure's known-group validity (see also Rohner & Björklund, 2006).

Some research into implicit sexual prejudice has used the same stimuli, whilst other researchers have used different stimuli to represent the same categories of gay men and lesbians. For example, rather than representing gay men and lesbians with pictures of same-sex couples, some researchers used pictures of same-gender individuals in neutral poses (e.g., Cochran et al., 2007;

Lemm, 2006; Nosek et al., 2005; Rowatt et al., 2006; Tsang & Rowatt, 2007). However, the non-romantic depiction of couples in these stimuli raises questions about the nature of their relationship. To counter this, other researchers used same-sex couples in romantic poses (e.g., Dasgupta & Rivera, 2006, 2008; Gabriel et al., 2007; Jellison et al., 2004). This seems a logical improvement in refining the attitude-target being represented by such stimuli, however, representations of gay couples (who are actively transgressing social norms) are still qualitatively different to a representation of a gay individual.

Other stimuli used to represent gay men and lesbians in the literature include names of hypothetical same-sex couples (e.g., PETER + JACK; Steffens & Buchner, 2003, Experiment 1), words stereotypically associated with the category (e.g., "drag queen;" Steffens & Buchner, 2003, Experiment 2), and word-based stimuli involving the category itself (e.g., HOMOSEXUAL; Cárdenas & Barrientos, 2008; Lemm, 2006, Experiment 1). Gay men and lesbians have also been represented using visual stimuli representative of the category, such as interlocking gender symbols or same-sex wedding cake toppers, etc (usually in conjunction with pictures of same sex couples; e.g., Cochran et al., 2007; Gabriel et al., 2007; Inbar et al., 2009; Jonathan, 2008; Lemm, 2006; Rowatt et al., 2006; Tsang & Rowatt, 2007).

These category-based stimuli arguably represent an abstract and multifaceted category of the category of *gay*, but are unlikely to measure attitudes toward *gay people*. For example, same-sex cake toppers might tap into attitudes toward gay marriage; pictures of a gay couple in a romantic pose might measure attitudes toward public displays of affection by gay couples; the gay pride flag or interlocking gender symbols may elicit attitudes toward political activism by the gay and lesbian community. Moreover, without explicit instruction, some of the stimuli are ambiguous (e.g., two male names [PETER + JACK] do not equate to a same-sex couple; interlocking female symbols [commonly used to represent the lesbian community] are equally as commonly known for being the Double Venus symbol from astrology). Given that stimuli selection is known to impact implicit attitude effects (e.g., Bluemke & Friese, 2006; Steffens et al., 2008), we argue that precise stimuli selection is vital to ensuring the internal validity of implicit social cognition research.

The majority of studies in the literature to date (using these various stimuli) have reported moderate to strong demonstrations of implicit sexual prejudice, with a few exceptions including neutral implicit attitudes toward gay men and lesbians (Breen & Karpinski, 2013, Study 1), and positive implicit attitudes toward lesbians (Breen & Karpinski, 2013, Study 2; Steffens, 2005). Although measurement of attitudes toward the multi-faceted issue of gay (with its complex social and political ramifications) may be interesting in and of itself, we argue that it is possible that implicit category-based attitudes, as measured so far, are different to attitudes toward gay people. Thus, the overarching aim

of this paper is to present the initial evidence for a method of measuring implicit sexuality attitudes toward gay people.

Overview of experiments

In this paper, we present the person-based approach as an alternative to the above-mentioned methods of representing gay men and lesbians when measuring implicit attitudes. The approach suggests using faces of gay individuals who are presented with their sexuality as the salient social category (by using same-gender, straight distractor stimuli—without a gender comparison sexual orientation is the only salient social category left to distinguish the targets from the distracters). Specifically, this approach poses that when gay men are the target category, straight male stimuli need to be used as distracters. Similarly, when lesbians are the target category, then straight female stimuli need to be used as distracters. This approach is based on the category-salience effect (Mitchell et al., 2003) of the Go/No-Go Association Task (Nosek & Banaji, 2001). The strength of this approach lies in the idea of varying the context in which the association is measured, by methodologically creating category salience through manipulating the distractor stimuli used.

The primary aim of this paper was to provide evidence for the person-based approach to representing gay men and lesbians in measures of implicit attitudes. Therefore, in Experiment 1, we conducted a study that aimed to demonstrate that gender and sexuality-based attitudes could be disentangled through the use of contextual variation (i.e., changing the salient social category by manipulating the distractor stimuli). Specifically, person-based implicit gender attitudes (toward famous straight men and women and toward famous gay men and lesbians, to avoid a learning phase of the experiment) were assessed in an online experiment after making gender salient by using targets of one gender and distracters of the opposite gender. Person-based implicit sexuality attitudes (toward famous gay men and lesbians) were assessed after making sexuality salient by using straight distracters of the same gender as the target (for a visual depiction, see Figure 1—note that panels 1b, 1c, 1e, and 1f all use stimuli of gay male/lesbian targets, but only panel 1c and 1f measure person-based sexuality attitudes). In Study 2, we replicated this experiment with novel stimuli that were introduced during a phase in which their sexuality was learnt, and their gender was already apparent. In Experiment 3, we explored patterns of group-based bias in person-based (gender and sexuality) attitudes by replicating the first experiment in samples of gay men, lesbians, and straight men and women. Finally, Experiments 4 and 5 directly compared category-based and person-based implicit sexuality attitudes (using famous face and novel face stimuli, respectively). A summary of the methods and sample characteristics is presented in Table 1 (including a map of which experiments test each hypothesis). The

	Gender based attitudes (towards straight targets)	Gender based attitudes (towards gay targets)	Sexuality based attitudes (towards gay targets)
Female target	(a)	(b)	(c)
Male targets	(d)	(e)	(f)

Figure 1. Visual representation of the use contextual variation methodology used in the person-based approach (Note: larger images represent target stimuli, smaller images represent distractor stimuli).

Table 1. Summary of sample characteristics, methods, and hypotheses being tested across all five experiments.

Experiment	Sample	n	Gender composition (% female)	Sample characteristics	M_{age} (SD) in years	Mode	H1	H2	H3
1	Australian	49	100	Students	22.50 (3.02)	Online	H1	H2	
2	Swiss	74	100	Students	21.99 (2.86)	In person	H1	H2	
3	Australian	96	50%	Community	24.70 (5.42)	Online	H1	H2	
4	Australian	51	82%	Students	24.94 (11.38)	Online		H2	H3
5	Swiss	94	37%	Community	33.15 (11.09)	Online		H2	H3

Experiments 1–2 and 4–5 comprised entirely heterosexual participants, Experiment 3 comprised 50% heterosexual and 50% gay/lesbian participants.

materials and stimuli are presented online at https://osf.io/av5tx/?view_only= 7154311c6a6a4c55806e6eb5a077b964.

We measured implicit attitudes with a contextual variation-GNAT (Nosek & Banaji, 2001). The decision to use the GNAT rather than the well-established IAT was based on the ability for the GNAT to elicit contextual variations through varying the distractor stimuli in a way that the IAT cannot (see Mitchell et al., 2003). In addition, the GNAT has several features that make it more desirable that the IAT, such as not needing to counter balance handedness (i.e., participants use their dominant hand in all blocks vs. counterbalancing the dominant hand on the congruent and incongruent blocks)

and being more participant friendly (requiring the classification of 2 categories in the GNAT rather than 4 in the IAT, see Nosek & Banaji, 2001 for a discussion). Good reliability was demonstrated in all experimental blocks ranging from RaSSH = .62 to RaSSH = .76 using the method described by Williams and Kaufmann (2012).

We also assessed explicit attitudes in all experiments by having participants complete the Attitudes Toward Lesbians and Gay men scale (ATLG; Herek, 1984) or the Attitudes Toward Homosexuality Scale (Anderson et al., 2018). As they were unrelated to the key aims of this study, they are not reported here. However, in the interests of transparent science, the details are available on the OSF at https://osf.io/av5tx/?view_only=7154311c6a6a4c55806e6eb5a077b964).

Across the five experiments, we tested the following hypotheses:

H1: *Person-based implicit gender attitudes* – Based on existing gender attitudes research (e.g., Richeson & Ambady, 2001; Rudman & Goodwin, 2004), we predicted that person-based implicit gender attitudes toward female targets would be positive, regardless of their sexuality (i.e., both heterosexual women and lesbian women when their gender was salient (Figure 1a,b)), compared to person-based implicit gender attitudes toward male targets which would be negative (Figure 1d,e).

H2: *Person-based implicit sexuality attitudes* - In contrast to H1, and based on implicit inversion theory (Kite & Deaux, 1987), we predicted that person-based implicit sexuality-based orientation attitudes toward lesbian (Figure 1c) and gay male targets (Figure 1f) would be reversed from their gender-based attitudes. More specifically, if gay men are perceived as having attributes that are similar to straight women then positive implicit person-based sexuality attitudes could be expected. Conversely, if lesbians are perceived as having attributes that are similar to straight men then negative person-based implicit sexuality attitudes could be expected.

H3: *Person-based vs. Category-based* - We expect person-based implicit attitudes toward gay men and lesbians to be qualitatively different to the category-based implicit attitudes. Specifically, in line with H2, we hypothesize that person-based representations will elicit positive implicit attitudes toward gay men, but negative implicit attitudes toward lesbians. Conversely, we hypothesize that category-based representations will elicit positive implicit attitudes toward lesbians, but negative implicit attitudes toward gay men (in line with the existing literature; Banse et al., 2001; Breen & Karpinski, 2013). Thus, in a direct comparison, we expect that attitudes toward gay men will be more positive when elicited using person-based representations than when

using category-based representations, and conversely that attitudes toward lesbian women will be more positive when elicited using category-based representations than when using person-based representations.

Together, these findings will provide evidence that contextual variation, by same- or opposite-gender distracters, allows the distinctive assessment of implicit gender attitudes from implicit sexual orientation attitudes when using person-based representations.

Experiment 1

In this study, we explored if implicit contextual variation techniques (established for targets of intersecting ethnicity and gender; Mitchell et al., 2003) could extend to targets of intersecting sexuality and gender. Specifically, we tested in we were able to disentangle person-based implicit gender attitudes from implicit sexuality attitudes in a sample of straight women. A homogenous sample of straight women was used to limit the effects of extraneous factors (i.e., to eliminate potential intergroup confounds) as this initial experiment was principally concerned with demonstrating the usefulness of the person-based approach, and also to establish the effect size that would be needed in subsequent studies.

Method

Participants

Participants were 51 straight Australian women (M_{age} = 22.50 years, SD = 3.02) from an online sample of convenience, recruited via social networking sites. Seven participants did not disclose their age. Participants whose performance across blocks on the implicit measure was equal to or less than chance ($d' \leq 0$) were excluded from analyses ($n = 2$).

Throughout this paper, we conducted all our power analyses using the power analysis program, *G*Power* (Faul et al., 2007). In this study, our power analysis was based the effect of the work of Mitchell et al. (2003) who explored implicit contextual variations as a function of ethnicity and gender. Notably, they found that the effects were weaker for pictorial stimuli (Study 5, $d = .59$) than for word stimuli (Study 4, $d = 1.59$), and thus we based our power analyses on the former. For a design including six experimental within-subjects conditions and an error probability of .05 ($\beta = .95$), a power analysis indicated a required sample of 45 participants in order to detect an effect size of $d = .59$ (i.e., $f = .29$). We also conducted a post-hoc power analysis based on the effect size of the interaction ($\eta_p^2 = .35$ [see below] which is equivalent to

Cohen's $f = 0.71$) which suggested that this sample is properly powered to detect the previously stated effect size ($\beta = 1.00$).

Measures

Implicit measure. A 12-block GNAT (Nosek & Banaji, 2001) assessed implicit associations between male and female targets, and positive and negative attributes (see Table 2). For each block, participants were instructed that they would see a picture or word presented briefly in the center of the computer screen to which they should respond by pressing the spacebar key (i.e., a "go" response) if the word or picture represented either target (i.e., category or attribute) named in the top left and right corners of the screen. Alternatively, participants were asked to make no response (i.e., a "no-go" response) if the word or picture did not belong to either of the named targets. Prior to each block, participants were presented with a complete set of target category stimuli (i.e., photographs) and were told that target label (e.g., "MEN" and "POSITIVE") for that block would be present throughout the block of trials. In the gender-based attitude blocks (for both heterosexual and gay targets), the target category labels were MEN/WOMEN, and the sexuality-based attitude blocks the labels were GAY MEN/LESBIAN WOMEN.

Each block comprised 20 practice trials and 80 experimental trials including equal numbers of "go" trials (i.e., target) and "no-go" trials (i.e., distracter). Each trial had a response deadline of 600 ms, separated by an inter-stimulus interval (ISI) of 200 ms. Word stimuli were presented in white 24-point uppercase Arial font. Image stimuli were presented in a white 10 cm × 10 cm frame. All stimuli were presented against a black background screen. Feedback followed every trial with a green "O" following correct responses, and a red "X" following incorrect responses. The order of GNAT blocks was randomized to limit order effects across the sample.

Stimuli. Stimuli representing the categories male and female and the attributes positive and negative were used as both targets and distracters. Twenty-

Table 2. GNAT blocks as a function of target and distracters categories.

Factor measured	Targets		Distracters	
	Category	Attribute	Category	Attribute
Gender based attitudes	Straight male	Positive	Straight female	Negative
(toward straight targets)	Straight male	Negative	Straight female	Positive
	Straight female	Positive	Straight male	Negative
	Straight female	Negative	Straight male	Positive
Gender based attitudes	Gay male	Positive	Straight female	Negative
(toward gay targets)	Gay male	Negative	Straight female	Positive
	Gay female	Positive	Straight male	Negative
	Gay female	Negative	Straight male	Positive
Sexuality based attitudes (toward gay targets)	Gay male	Positive	Straight male	Negative
	Gay male	Negative	Straight male	Positive
	Gay female	Positive	Straight female	Negative
	Gay female	Negative	Straight female	Positive

four photographs of famous gay males (e.g., Sean Hayes), lesbians (e.g., Ellen DeGeneres), straight males (e.g., Robbie Williams), and straight females (e.g., Eva Longoria) represented the categories (i.e., 6 photos for each category). Using celebrities who are easily recognized for both their gender and their sexuality permitted manipulation of the target factor (i.e., gender or sexuality) using contextual variation without requiring participants to endure a learning phase prior to the experiment. For this reason, photograph stimuli were selected on the basis of being correctly identified by 90% of a pilot sample as being a celebrity and either straight or gay. In addition, the stimuli were matched for perceived age, equal levels of fame, and attractiveness. Eight positive-meaning words (e.g., HAPPY) and eight negative-meaning words (e.g., AWFUL) were selected from a list of valence terms on the basis of similar word length and frequency (i.e., positive terms: average length = 5.0 characters, average frequency = 76.0; negative terms: average length = 4.7 characters; average frequency = 93.2; Francis & Kucera, 1982).

Scoring. Implicit associations are calculated using the procedure recommended by Nosek and Banaji (2001). Specifically, scores for each block are calculated using the signal detection theory index of d' (e.g., Green & Swets, 1966) based on the ratio of correctly identified targets (i.e., participants pressed the spacebar key when a target photograph or word was presented) and incorrectly identified distracters (i.e., participants pressed the spacebar key when a distracter photograph or word was presented). For ease of interpretation, a single implicit attitude index was calculated for each target (e.g., GAY MEN) by subtracting the d' for negative blocks (e.g., GAY MEN-NEGATIVE) from positive blocks (e.g., GAY MEN-POSITIVE) so that positive scores indicate positive implicit attitudes and negative scores indicate negative implicit attitudes.

Procedure

A link to the online experiment was made available through social networking sites. Participants followed the link to the website that hosted the experiment (http://www.millisecond.com/) where they could read an information letter about the purpose and methods of the experiment. If they chose to participate, participants indicated their informed consent before providing demographic information and completing the randomized 12-block GNAT before being thanked and de-briefed.

Piloting the stimuli

We took several steps in order to ensure that experimental effects in this paper were not driven by biases pertaining to our stimuli. For the famous (celebrity) faces we endeavored to select stimuli that we believed to be of similar levels of

fame, age, and attraction. We then informally piloted the stimuli with 15 students to ensure the stimuli could be recognized both for their celebrity status (100% identification accuracy) and for their sexual orientation (96% identification accuracy). We then formally piloted the stimuli with 20 undergraduate female psychology students, asking them to rate the gay male and lesbian stimuli on their likability and attractiveness on a scale from −2 (*unlikeable/unattractive*) to +2 (*likeable/attractive*). There were no stimuli effects for either likability ($M_{\text{gay men}} = 0.51$, $SD = 0.72$; $M_{\text{lesbian}} = 0.38$, $SD = 0.63$, $t[19] = 0.84$, $p = .414$) or attractiveness ($M_{\text{gay men}} = 0.37$, $SD = 0.55$; $M_{\text{lesbian}} = 0.52$, $SD = 0.52$, $t[19] = -1.87$, $p = .077$). Given the small sample size, we also conducted Wilcoxon signed ranks tests which also returned non-significant differences (likability: $Z = -0.88$, $p = .381$; attractiveness: $Z = -1.89$, $p = .058$). Note that we did not pilot the straight stimuli.

Results

Descriptive findings

In the case of person-based implicit gender attitudes, we found the predicted implicit associations between women and positive, and men and negative. Descriptively, this pattern of results existed for both gay and straight targets (i.e., straight and lesbian women were evaluated as implicitly positive, and straight and gay men were evaluated as implicitly negative). Interestingly, the pattern of findings in the case of person-based implicit sexuality attitudes was both strongly attenuated and reversed (see Figure 2).
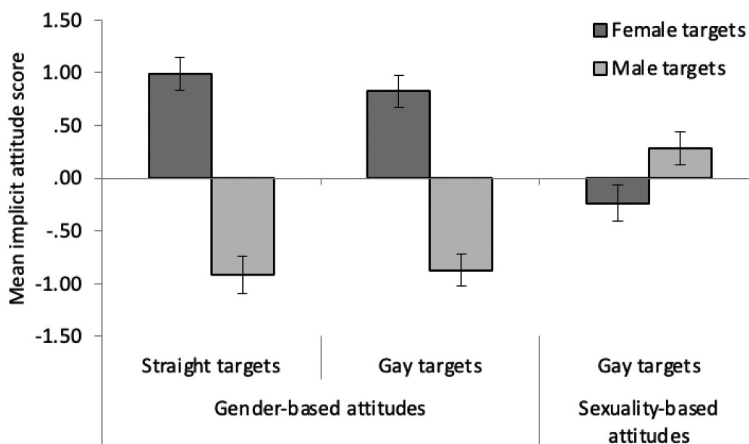
Figure 2. Mean (and standard error) implicit attitude scores for famous female and male targets as a function of GNAT (Experiment 1). Error bars represent ± 1 SE.
The same stimuli are used for gay targets in the gender-based blocks and in the sexuality-based blocks (see Figure 1).

Inferential statistics

A repeated-measures factorial ANOVA was used to explore person-based implicit attitudes toward female and male targets using within-subject factors of *target gender* (2: female targets, male targets) and *GNAT variation* (3: gender-based attitudes toward straight targets, gender-based attitudes toward gay targets, sexuality-based attitudes toward gay targets). Analysis revealed a significant interaction between *target gender* and the *GNAT variation* $F(2,86) = 23.27$, $p < .001$, $\eta_p^2 = .35$. In support of H2, post-hoc tests revealed that gender-based attitudes toward female targets were significantly more positive than gender-based attitudes toward male targets, regardless of the target's sexuality (i.e., straight targets: $t(54) = 5.12$, $p < .001$; gay targets $t(45) = 5.31$, $p < .001$). In support of H3, this pattern was found to be reversed for sexuality-based attitudes with sexuality-salient gay male targets being significantly more positive than sexuality-salient lesbians $t(47) = -2.30$, $p = .030$).

Discussion

Consistent with predictions, person-based implicit gender attitudes toward women (gay and straight) were positive and person-based implicit gender attitudes toward men (gay and straight) were negative. Interestingly, this difference was attenuated, and the pattern reversed for sexuality attitudes. Notably, sexuality-based implicit attitudes toward gay male targets were positive which is inconsistent with previous research (Banse et al., 2001; Dasgupta & Rivera, 2006, 2008; Gabriel et al., 2007). However, sexuality-based implicit attitudes toward lesbians were negative, which was consistent with predictions.

An obvious feature of this experiment is that we opted to use faces of famous gay individuals as stimuli. We recognize that their fame could create certain confounds (e.g., halo effects; Thorndike, 1920); however, the fact that all stimuli used (e.g., target and distractor) were selected and matched on equal levels of fame (see method section), this has little impact on the interpretation of these results. Despite this, in order to rule out any limitations of halo effects, we can acknowledge the utility in exploring if this pattern holds with non-famous stimuli, which we explore in Experiment 2. However, the evidence from Experiment 1 allows us to conclude that, in the case of attitudes toward a famous gay celebrity, one can measure gender-based attitudes toward Sean Hayes as a male (if the comparison context is Eva Longoria, in which there is a salient gender comparison) or as a gay person (if the comparison context is Robbie Williams, in which the gender comparison is removed leaving sexuality as the only available differentiating category).

Experiment 2

Experiment 1 presented initial evidence for the efficacy of the person-based approach to measuring implicit attitudes toward gay men and lesbian women with famous faces used as pictorial stimuli. In order to circumvent any potential issues with halo effects, in Experiment 2 we replicated the first experiment except we used novel stimuli that are introduced during a phase in which their sexuality is learnt, and their gender is already apparent. As per Experiment 1, a homogenous sample of straight women was used to limit the effects of extraneous factors.

Method

Participants

Participants were 74 straight Swiss women (M_{age} = 21.99 years, SD = 2.86) who were volunteers recruited from the University of Geneva. All participants' performance across experimental blocks was acceptable—no participants were excluded from analyses. The same power analysis from Experiment 1 indicated a required sample of 44 participants in order to detect an effect size of d = .59. Given the effect size of Experiment 1 was larger than this (d = 1.42), we are content that these analyses are adequately powered. We also conducted a post-hoc power analysis based on the effect size of the interaction (η_p^2 = .32 [see below] which is equivalent to Cohen's f = 0.66) which suggested that this sample is properly powered to detect the previously stated effect size (β = 1.00).

Measures

The 12-block GNAT used in Experiment 1 was again administered in this experiment. The protocol and scoring remained unchanged, as did the stimuli used to represent POSITIVE and NEGATIVE attributes. The sole difference was the stimuli used—in this experiment, 24 pictures of novel faces were used to represent the categories, specifically 6 images represented gay males, 6 represented lesbians, 6 represented straight males, and 6 represented straight females (*note*: the sets of images were counterbalanced to avoid stimuli effects [i.e., one set was first presented as gay males/lesbians to one participant, and then as straight males/straight females to the next participant, etc.]). The pictures were taken or cropped to be from the shoulders up, and were chosen if they were "natural looking" (e.g., minimal amounts of make-up etc.). The stimuli are available on the OSF.

These pictures were sourced from freely available images on the internet, and so in reality we do not know the sexual identity of the men and women in the images. Instead, participants were first shown a card with all the faces and their sexual identity and given as much time to memorize the

sexual identity of the faces as they needed. When ready, participants were given a pile of cards, each card with one of the faces printed on it, to sort on the basis of sexual identity. If the participants could correctly classify all cards in the set, the were asked to wait 1 min and then repeat the process. If they were correct the second time they could proceed to the experiment (i.e., they had successfully completed the learning phase). If incorrect at either point, the learning phase started again. There is evidence that this process was effective, as there was no need to exclude any participants on the bases of low performance (which would be expected if they social categories of the pictorial stimuli were being guessed). In addition, as per Experiment 1, participants were given feedback on correct and incorrect classification following each trial. Finally, following debriefing all participants were asked to reflect on how well they believed they knew the sexual identity of the stimuli, and all reported that they were confident in their ability to accurately classify the participants.

Procedure

Participants responded to flyers by contacting the research team to arrange a time to participate. At this point, an information letter was provided to the participants, to allow them consent upon arrival. Participants were welcomed to the lab, where they provided consent followed by their age. Participants then underwent the "learning phase" of the experiment in order to learn the sexual identity of the stimuli (their gender was already apparent). Once successfully completed, the 12-block GNAT was administered on a laptop before being thanked and de-briefed.

Results

Descriptive findings

In the case of person-based implicit gender attitudes with novel face stimuli, we again found the predicted implicit associations between women and positive, and men and negative (for both gay and straight targets). Again, the pattern of findings in the case of person-based implicit sexuality attitudes was both strongly attenuated and reversed (see Figure 3).

Inferential statistics

A repeated-measures factorial ANOVA was used to explore person-based implicit attitudes using within-subject factors of *target gender* (2: female, male) and *GNAT variation* (3: gender-based attitudes toward straight targets, gender-based attitudes toward gay targets, sexuality-based attitudes toward gay targets). Analysis revealed the expected significant interaction between *target gender* and the *GNAT variation* $F(2,146) = 33.53$, $p < .001$, $\eta_p^2 = .32$. In support of H2, post-hoc tests revealed that gender-based attitudes toward
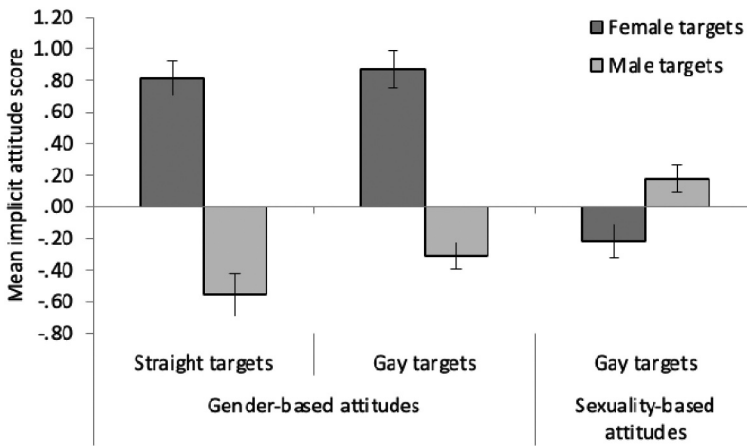
Figure 3. Mean (and standard error) implicit attitude scores for novel female and male targets as a function of GNAT (Experiment 2). Error bars represent ± 1 SE.
The same stimuli are used for gay targets in the gender-based blocks and in the sexuality-based blocks. Differences emerge only as a function of the gender of the distractor stimuli used (see Figure 1).

female targets were significantly more positive than gender-based attitudes toward male targets, regardless of the target's sexuality (i.e., straight targets: $t(73) = 6.96$, $p < .001$; gay targets $t(73) = 8.21$, $p < .001$). In support of H2, this pattern was found to be reversed for sexuality-based attitudes with sexuality-salient gay male targets being significantly more positive than sexuality-salient lesbians $t(47) = -2.30$, $p = .025$.

Discussion

The findings of Experiment 2 replicate the findings of Experiment 1 are consistent with the predictions of H2. As with Experiment 1, person-based implicit gender attitudes toward women (gay and straight) were positive and person-based implicit gender attitudes toward men (gay and straight) were negative, and this pattern reversed for sexuality-based attitudes. This suggests that online participation and the efficient and convenient use of pictures of famous people as stimuli produced a very similar pattern of effects (and effect sizes).

Given the homogenous (i.e., straight female) nature of the samples used so far, it is possible to conclude that the results of Experiments 1 and 2 merely demonstrate a simple in-group bias effect (i.e., in-group is significantly more implicitly positive than all out-groups). However, this explanation does not easily account for the finding that women's gender-based implicit attitudes toward men (both gay and straight) was significantly different to their sexuality-based attitudes toward gay men (remembering that the target stimuli were constant, and this variation

in attitudes occurred only as a result of changing the distractor stimuli). A more parsimonious account of this finding is offered by implicit inversion theory (Kite & Deaux, 1987), which would explain the implicit positivity toward gay men and straight women, and the negativity toward straight men and lesbians, observed in this experiment may have resulted from perceived similarity in stereotypical attributes between these groups.

Experiment 3

Experiments 1 and 2 provided evidence that contextual variation approaches can measure distinct person-based implicit gender and sexuality attitudes, and demonstrated the variability of these attitudes as a function of implicit contextual variation. The next step was to fully explore the role of in-group bias in these implicit evaluations. For example, would any group other than straight women (i.e., lesbians, straight men, or gay men) demonstrate an implicit gender- or sexuality-based in-group bias? To address this question, Experiment 3 replicated the method used in Experiment 1 (i.e., online data collection, use of famous faces, etc.), however we recruited samples of gay men, lesbians, and straight men and women (i.e., a gender by sexuality design).

Method

Participants
Participants were 24 straight women (M_{age} = 24.08 years, SD = 4.68), 24 lesbians (M_{age} = 25.27 years, SD = 6.70), 24 straight men (M_{age} = 24.67 years, SD = 5.85), and 24 gay men (M_{age} = 24.78 years, SD = 4.44). Participants were recruited from social networking sites to participate in this online, anonymous research, and all 96 participants in the final sample were Australian. Thirty-two of these participants did not disclose their age. No participants were excluded for poor performance (i.e., at or below chance) on the GNAT.

Our power analysis indicated that for a design including six experimental within-subjects conditions across four between-subjects groups, and an error probability of .05 (β = .95, correlation between measures = .05), a required sample of 90 participants would be required in order to detect an effect size of d = .59. We are content that these analyses are adequately powered. We also conducted a post-hoc power analysis based on the effect size of the two-way interaction (η_p^2 = .39 [see below] which is equivalent to Cohen's f = 1.11) which suggested that this sample is properly powered to detect the previously stated effect size (β = 1.00).

Measures and procedure

Using the same procedure as Experiment 1, participants read an information letter and provided informed consent before completing measures.

Results

Descriptive findings

As predicted, demonstrations of gender-based implicit attitudes toward gay and straight female targets were positive from all participants. Interestingly, sexuality-based attitudes toward gay male targets were also implicitly associated with positive by all participants, albeit less strongly than female targets. These findings were consistent for both straight and gay male participants who demonstrated positive implicit attitudes toward gay male targets when the attitudes were based on sexuality, but negative implicit attitudes toward the same gay male targets when the attitudes were based on gender. However, only gay men demonstrated positive gender-based implicit attitudes toward straight male targets. Means and standard errors for implicit attitudes are presented in Figure 4.

Inferential statistics

A mixed-design factorial ANOVA was used to explore implicit person-based attitudes as a function of participant in-group bias using the within-subjects factors of *target* (2: female targets, male targets) and *GNAT variation* (3: gender-based straight targets, gender-based gay targets, sexuality-based gay targets), and the between-subjects factors of *participant gender* (2: female, male) and *participant sexuality* (2: straight, gay). As in Experiment 1, analysis revealed a main effect of *target gender*, $F(1,92) = 64.09$, $p < .001$, $\eta_p^2 = .41$, which was complicated by a significant interaction with *GNAT variation* $F(2,92) = 59.59$, $p < .001$, $\eta_p^2 = .39$. However, as a four-way interaction was found $F(2,184) = 3.98$, $p = .02$, $\eta_p^2 = .04$ (using a Huynh-Feldt corrections due to violations of sphericity), only this result was interpreted.

Post hoc analyses revealed that *participant sexuality* differences for female participants $F(2,94) = 4.19$, $p < .020$, $\eta_p^2 = .080$, but not male participants ($p = .071$), and *participant gender* difference for straight participants $F(2,102) = 12.33$, $p < .001$, $\eta_p^2 = .203$, but not gay participants ($p = .310$) was the basis for this complicated effect. Specifically, post-hoc *t*-tests revealed that straight female participants demonstrated significantly more positive implicit gender-based attitudes toward (gay and straight) women than toward (gay and straight) men (i.e., gender-based attitudes toward straight targets $t(23) = 6.95$, $p < .001$ and gender-based attitudes toward gay targets $t(23) = 5.48$, $p < .001$). This effect also existed for lesbian participants (gender-based attitudes toward straight targets $t(23) = 5.67$, $p < .001$ and gender-based attitudes toward gay
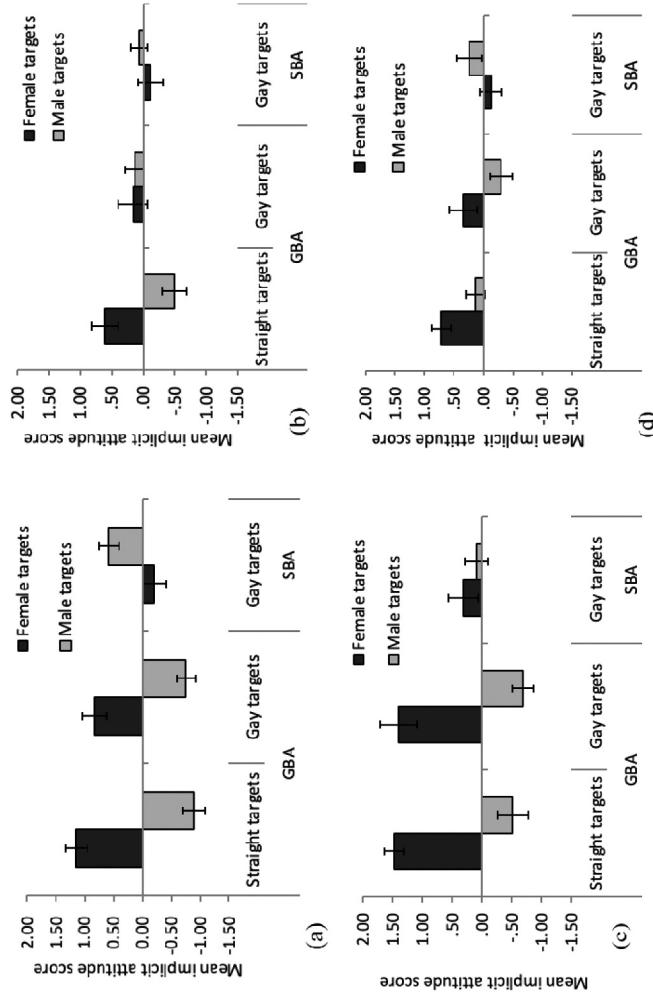
Figure 4. Mean (and SE) implicit attitude scores toward targets on the basis of gender or sexuality for heterosexual (a) female, (b) male, (c) lesbian, and (d) gay male participants (Experiment 3). Error bars represent ± 1 SE; GBA = gender-based attitudes, SBA = sexuality-based attitudes.

targets $t(23) = 6.66$, $p < .001$). However, straight women also demonstrated positive sexuality-based implicit attitudes toward gay male targets and negativity sexuality-based implicit attitudes toward lesbian targets $t(23) = -2.90$, $p = .014$. In contrast, lesbian participants demonstrated no significant difference in sexuality-based implicit attitudes toward gay males and lesbians (i.e., $p = .412$).

Implicit attitudes of men were attenuated relative to the implicit attitudes demonstrated by women. However, like women, men demonstrated significantly more implicit positive attitudes toward straight female targets than toward male targets $t(48) = 3.86$, $p < .001$. No other differences reached significance (i.e., all p's > .48). Interestingly, male participants' performance did not differ significantly as a function of their sexuality (all p's > .12).

Discussion

This study largely replicated the findings of the previous two experiments, albeit with some important caveats, and provided substantial support for H1 and H2. Consistent with predictions and previous research (e.g., Rudman & Goodwin, 2004), all participants demonstrated positive gender-based implicit attitudes toward female targets. This finding provides an example of the "women are wonderful" effect (Eagly & Mladinic, 1994), rather than evidence for an in-group bias among female participants. In-group gender-based bias was not found for straight male participants; however, small in-group positivity biases were observed for gay men and lesbian participants on both gender and sexuality dimensions. That is, gay men demonstrated positive implicit gender-based attitudes toward straight male targets and sexuality-based attitudes toward gay male targets. Similarly, lesbians demonstrated positive implicit attitudes toward all female targets. It is interesting to note that gay male participants demonstrated negative implicit sexuality-based attitudes toward gay male targets, although there is no clear interpretation of this finding.

The findings of Experiment 3 provide limited support for the predictions of general implicit sexual prejudice (i.e., implicit attitudes toward gay targets were somewhat ambivalent). What is clear, however, is that the person-based sexuality attitudes observed in Experiment 3 were far more neutral than is typically observed with category-based measures of implicit attitudes (Anderson & Koc, 2015; Banse et al., 2001; Dasgupta & Rivera, 2006, 2008; Gabriel et al., 2007; Moor et al., 2019). This finding suggests that person-based implicit sexual prejudice may be far less negative than the abstract and amorphous category-based sexual prejudice that is usually reported in the literature (Cullen & Barnes-Holmes, 2008).

Experiment 3 replicated and extended the findings of Experiments 1 and 2 providing further descriptive evidence that the person-based approach provides a unique method for assessing implicit attitudes to a social category, even when there are no unique visible features associated with that social category (e.g., Freeman et al., 2010). Moreover, these results demonstrate consistencies (e.g., attitudes toward women when gender is salient) as well as important patterns of variability reflecting gender and sexuality-based group memberships which are frequently overlooked in research on gender attitudes and sexual prejudice. Although the evidence presented so far provides interesting findings pertaining to disentangling evaluative social categories, the answer of how person-based results differ from category-results remains unanswered.

Experiment 4

The findings of Experiments 1–3 stand in clear contrast to the majority of the existing published data based on category-based implicit attitudes toward gay men and lesbian women. Previous research has consistently found implicit sexual prejudice toward gay men and (albeit, to a lesser extent) lesbians, but the person-based approach to representation elicited positive implicit anti-gay attitudes toward gay men and negative implicit attitudes toward lesbians (but importantly, this effect only held when the attitudes were based on sexuality, and did not exist when the attitudes were based on gender). This preliminary work presents strong evidence that person-based implicit attitudes may be different to attitudes that are category-based. To solidify the evidence, Experiment 4 measures anti-gay attitudes using both forms of representation, in order to compare them directly (i.e., category-based and person-based sexuality attitudes using famous faces (Figure 1c,f only) - no gender-based attitudes are measured in this experiment), thus testing H3.

Method

Participants
Sixty-three student participants were recruited from Australian Catholic University. Ten participants (15.87%) were excluded from analyses after identifying as non-heterosexual (6 bisexual females, 3 gay men, and 1 lesbian woman). Two participants (3.17%) were excluded from analyses for performing below the level of chance accuracy on the implicit measure. The final sample comprised 51 straight Australian students (M_{age} = 24.94 years, SD = 11.38, 42 women). All participants were eligible for research credit in an undergraduate psychology unit in exchange for their participation. The power analyses for a design including four experimental within-subjects conditions and an error probability of .05 (β = .95), a power analysis indicated a required sample of 54 participants in order

to detect an effect size of $d = .59$. We also conducted a post-hoc power analysis based on the effect size of the two-way interaction ($\eta_p^2 = .25$ [see below] which is equivalent to Cohen's $f = 0.55$) which suggested that this sample is properly powered to detect the previously stated effect size ($\beta = 1.00$).

Materials

The implicit attitude measure from Experiments 1 and 3 was again used, with a variation on the implicit measure that measured sexuality attitudes toward person-based and category-based representations. Specifically, an 8-block GNAT was used in which four blocks assessed category-based implicit attitudes toward gay men and lesbians (as per the existing literature), and a further four blocks measured person-based implicit attitudes toward gay men and lesbians (as per Experiments 1 and 3 [i.e., famous faces]). The design of this study was fully within-subjects, and blocks were presented in randomized fashion to limit order effects.

In blocks using the category-based approach, target stimuli were 24 pictures of couples in romantic poses, representations of marriage, and gender symbols. Eight of these represented the category of gay male, 8 represented the category of lesbian, and a further 8 that represented the category of straight served as distractors in category-based blocks these stimuli have been previously used in the literature by Anderson and Koc (2015) (see also Moor et al., 2019). The protocol and scoring for the GNAT, and the attribute stimuli used stimuli for person-based representations were the same as Experiments 1 and 3.
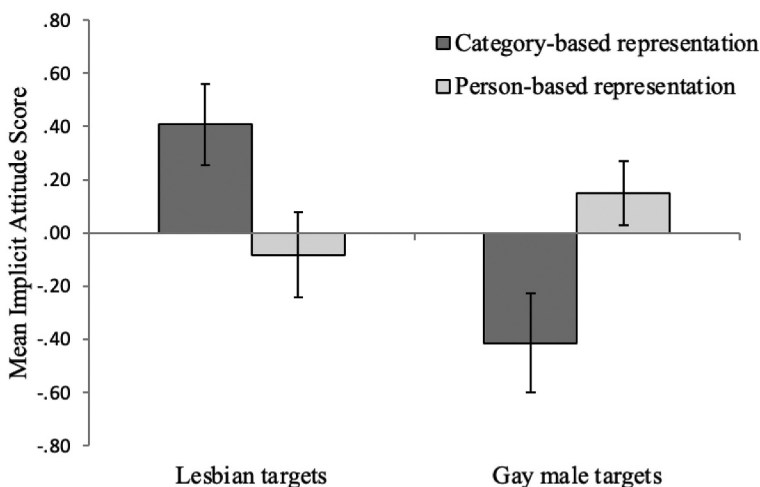
Figure 5. Mean (SE) Implicit attitude scores toward lesbian and gay male targets for category-based and person-based representations (Experiment 4). Error bars represent ± 1 SE.

Procedure

The experiment was advertised on the University's online research participation system, the remainder of the experiment used the same procedure as the previous experiments.

Results

Descriptive findings

Figure 5 presents the mean implicit attitude scores toward gay men and lesbians as a function of the type of representation used (category-based vs person-based). Implicit attitudes toward lesbians were more positive than implicit attitudes toward gay men when using a category-based approach to representation. However, this pattern of results was reversed when stimuli represented gay men and lesbian using a person-based approach.

Inferential statistics

A mixed-design factorial ANOVA was used to analyze implicit anti-gay attitudes using the within-subject factors of *representation* (2: category-based, person-based) and *target* (2: gay male, lesbian). No main effects were found (p's > .07), however, there was a significant interaction between *representation* and *target* variables, $F(1, 40) = 13.64$, $p = .001$, $\eta_p^2 = .25$. Post-hoc tests revealed that category-based implicit attitudes toward lesbians were significantly more positive than category-based implicit attitudes toward gay men, $t(41) = -2.31$, $p = .030$. However, person-based implicit attitudes toward lesbians were significantly more negative than person-based implicit attitudes toward gay men, $t(41) = 2.74$, $p = .012$. Implicit attitudes toward lesbians were also significantly more negative when measured using a person-based representation than when using a category-based representation, $t(41) = 4.05$, $p < .001$. There were no differences in implicit attitudes toward gay men as a function of *representation* ($p = .222$).

Discussion

The current experiment compared category-based and person-based approaches for representing gay men and lesbians in implicit measures. The pattern of person-based sexuality attitudes replicated the previous experiment supporting H3.

Experiment 5

Experiments 5 again measured anti-gay attitudes using both forms of representation (person-based and category-based), in order to compare them directly, however this time used the learning paradigm (as presented in

Experiment 2) to rule out any halo effects associated with the fame of the famous faces used in Experiment 4.

Method

Participants

Ninety-four Swiss participants were recruited online from community social media forums in Geneva, Switzerland (M_{age} = 33.15 years, SD = 11.09, 35 women). The power analyses for a design including 4 experimental within-subjects conditions and an error probability of .05, a power analysis indicated a required sample of 52 participants in order to detect an effect size of d = .59. We also conducted a post-hoc power analysis based on the effect size of the two-way interaction (η_p^2 = .30 [see below] which is equivalent to Cohen's f = 0.93) which suggested that this sample is properly powered to detect the previously stated effect size (β = 1.00).

Materials

The implicit measure from Experiment 4 was administered again (i.e., the 8-block GNAT administering the GNAT twice using both category- and person-based representations), however, the version of the GNAT using person-based representations was preceded by an online version of the stimuli learning phase described in Experiment 2 (whereby participants learn the sexual orientation of non-famous face stimuli).
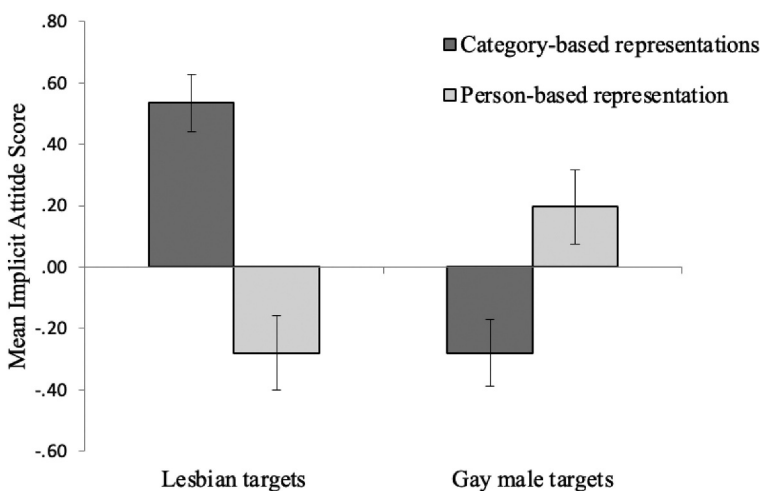
Figure 6. Mean (SE) Implicit attitude scores toward lesbian and gay male targets for category-based and person-based representations (Experiment 5). Error bars represent ± 1 SE.

Procedure

The experiment was advertised on community social media forums, the remainder of the experiment used the same procedure as the previous experiments.

Results

Descriptive findings

Replicating Experiment 4, implicit attitudes toward lesbians were more positive than implicit attitudes toward gay men when using a category-based approach to representation. Again, this pattern of results was reversed when stimuli represented gay men and lesbian using a person-based approach (Figure 6 presents the mean implicit attitude scores toward gay men and lesbians).

Inferential Statistics

A mixed-design factorial ANOVA was used to analyze implicit anti-gay attitudes using the within-subject factors of *representation* (2: category-based, person-based) and *target* (2: gay male, lesbian) and the between-subjects factor of *participant gender* (2: male, female). A main effect of target gender emerged $F(1, 89) = 4.98$, $p = .028$, $\eta_p^2 = .053$. No other main effects were found (p's > .132), however, there was a significant interaction between *representation* and *target* variables, $F(1, 40) = 37.65$, $p < .001$, $\eta_p^2 = .297$. No 3-way interaction emerged ($p = .096$).

Post-hoc tests revealed that category-based implicit attitudes toward lesbians were significantly more positive than category-based implicit attitudes toward gay men, $t(90) = -5.52$, $p < .001$. However, person-based implicit attitudes toward lesbians were significantly more negative than person-based implicit attitudes toward gay men, $t(93) = 2.20$, $p = .030$. Implicit attitudes toward lesbians were also significantly more negative when measured using a person-based representation than when using a category-based representation, $t(92) = 5.60$, $p < .001$, and in contrast implicit attitudes toward gay men were significantly more positive when measured using a person-based representation than when using a category-based representation, $t(91) = -1.982$, $p = .050$.

Discussion

Experiments 4 and 5 compared category-based and person-based approaches for representing gay men and lesbians in implicit measures. The pattern of person-based sexuality attitudes replicated across all experiments, supporting H2. Person-based implicit attitudes were dramatically different from category-based implicit attitudes for both gay men and lesbian targets, supporting H3.

When measured using category-based implicit attitudes toward lesbians were more positive than category-based attitudes toward gay men. In contrast, the person-based representation approach elicited a *reversed* pattern of results. Specifically, person-based implicit attitudes toward lesbians were significantly more negative than person-based implicit attitudes toward gay men. Moreover, the very valence of the attitudes reversed as a function of the method of representation (i.e., attitudes toward lesbians changed from positive to negative, and vice-versa for gay men). To the best of our knowledge, no other research using category-based representations has demonstrated implicit that are more negative toward lesbians than gay men.

The finding that category-based representations of gay men elicited negative implicit attitudes is consistent with the existing findings in the literature (e.g., Banse et al., 2001; Cullen & Barnes-Holmes, 2008; Dasgupta & Rivera, 2008; Nosek et al., 2005). However, finding that category-based representations of lesbians elicited positive implicit associations is consistent with only a few findings (e.g., Breen & Karpinski, 2013, Study 2; Steffens, 2005). These findings are also in accordance with implicit inversion theory (Kite & Deaux, 1987); person-based representations of gay men might be implicitly treated in the same way as straight women (i.e., positively) while lesbians might be implicitly treated in the same way as straight men (i.e., negatively). In this case, this result would match traditional gender findings (e.g., Rudman & Goodwin, 2004).

General discussion

Five experiments explored implicit attitudes toward gay men and lesbians, and presented the person-based approach to representation when measuring implicit attitudes as a function of either the target's gender or sexuality. The primary aims of the research were to explore the use of implicit contextual variation techniques to disentangle implicit gender attitudes from implicit sexuality attitudes (Experiments 1–5) using both famous faces (Experiments 1, 3, & 4) and novel faces following a learning phase (Experiments 2 & 5); to examine effects of participant gender and sexuality group memberships on person-based implicit attitudes (Experiments 3 & 5); and to provide a direct comparison between findings of person-based and category-based approaches to representation (Experiments 4 & 5).

Implicit attitudes

The findings across the three experiments support the general hypothesis that implicit attitudes vary as a function of contextual cues to reflect the salient factor of interest (i.e., gender and sexuality attitudes toward the same target can be measured distinctly from each other). Person-based

implicit gender attitudes were found to be largely consistent with previous gender attitudes literature (supporting H1), although the results for gender-based attitudes toward gay male and lesbian targets were somewhat attenuated, suggesting sexuality plays a role in the implicit gender attitudes.

The findings regarding implicit sexuality-based attitudes largely contrast previous empirical findings (e.g., Banse et al., 2001; Boysen & Vogel, 2008; Gabriel et al., 2007; Jonathan, 2008; Rowatt et al., 2009; Steffens & Buchner, 2003), especially toward gay male targets (supporting H2). In addition, findings also revealed important interactions with participant group membership factors (e.g., positive in-group biases for gay participants). We argue that this is because the person-based approach assesses implicit attitudes toward gay people, rather than the abstract category of gay (and associated issues such as gay marriage, same-sex behavior, etc.).

The person-based approach

The value of the person-based approach to implicit gender and sexuality-based attitudes is apparent when considering the current findings in the context of previous research. For example, the current finding reveals it is important to evaluate attitudes toward gay men and lesbians separately from each other, which is only possible with certain stimuli (e.g., cake toppers, but not gay pride flags). Consequently, the person-based approach is well-suited to this task, as it is able to assess both implicit gender and sexuality-based attitudes toward either gay men or lesbians. It even can even measure the gender or sexuality-based attitudes of the same target (e.g., Ellen DeGeneres as a woman compared to Ellen DeGeneres as a lesbian). Secondly, these findings demonstrate that it is possible to implicitly evaluate gay men, lesbians, and straight men or women as people, rather than just measuring association with the abstract social categories of gender and sexuality. Finally, a person-based measure of implicit sexual prejudice has the potential to address inconsistent findings from various approaches and stimuli by eliminating confounding influences (e.g., attitudes to gay marriage, gay pride, and public displays of affection).

Limitations

As is often the case with gay attitudes research, the current experiments may lack generalizability as a function of the sample. Specifically, the samples comprised mostly female students. Both of these groups have previously been found to have more politically liberal and egalitarian attitudes toward gay men and lesbians (e.g., Steffens, 2005). Furthermore, participants self-selected into this research, suggesting they were unconcerned by the topic. Consequently, it is possible the implicit attitudes were more positive than may

have been found in a less educated sample, or a sample with a higher proportion of male participants. However, this has no direct implication for the interpretation of the results as these concerns are not relevant to the observed dissociation between implicit attitudes in category-based vs. person-based approaches.

A potential limitation of the person-based approach in comparison to category-based approaches is that there is likely to be more variance around stimuli choice. For instance, face stimuli might vary in stereotypicality and familiarity, while category-based stimuli are less likely to effected by such concerns. It is also worth highlighting that the stimuli that rely on famous faces have limits—it should not be assumed that all participants would know all stimuli (or know them all equally well). Some of the stimuli of famous faces would not be known outside of Australia,[2] and as such researchers wishing to use a person-based approach should select and test stimuli relevant to their own locale. Similarly, the levels of fame of the stimuli will change with time or vary as a function of the age (or other demographic features) of the participants. In addition, we overlooked matching our stimuli on gender typicality, and would suggest that future piloting of stimuli should consider this.

Taken together, we recommend that researchers using the person-based approach select their stimuli with care based and local considerations around the participants, and consider asking participants questions about familiarity with the stimuli after they have completed their experimental GNAT blocks.

Implications

The implications of the current findings are that person-based measures of gender and sexuality (i.e., using people as targets) should not be undertaken without considering both factors, or at least considering factor salience during interpretation of the results. This is because every target has both a gender and a sexuality which (independently) can strongly attenuate, or even reverse, implicit attitudes. This effect is even more critical once a participant's own gender and sexuality are also considered, suggesting this is an important consideration for researchers.

The current findings also have implications for the use of category-based representations. First, results from category-based approaches to measurement are likely to reflect attitudes toward a complex and superordinate target category that does not only refer to the sexuality of individuals, but also to other social and cultural issues related to being gay. We argue that category-based representations of gay men and lesbians activate an abstract and multi-faceted category of gay. Thus, negative category-based implicit attitudes may be driven by any simultaneously activated associated facets such as "deviant" sexual behavior, same-sex marriage, and gay rights.

Future directions

This paper presents preliminary evidence, however there are several clear lines of research that might progress this line of work. First, research pertaining to the predictive validity of the person-based approach is needed (i.e., do attitudes measures in this way differently predict those measured by category-based approaches). Second, there is a need for evidence exploring if the person-based approach extends to other categories (both sexuality-based, such as attitudes toward bisexual men and women, and toward other social categories). Of course, for certain sexuality groups (e.g., bisexual, pansexual) findings a series of famous faces might be challenging. Third, there might be additional factors that moderate these implicit contextual variation effects driven by either stimuli (e.g., prototypicality) or the participant (e.g., preference for traditional gender roles). Finally, it would be worth knowing if there are other methods for inducing implicit contextual variation effects. For instance, previous work on implicit attitudes toward immigrants and refugees has varied the labels and descriptions for the stimuli to elicit differing attitudes including those affected by immigrant status (Anderson & Antalíková, 2014) and by religious affiliation (Cowling & Anderson, 2018). Little is known about how such factors influence attitudes in implicit measures and so research exploring similar techniques in sexuality-based attitudes is warranted.

Concluding remarks

The findings of this experiment are that person-based representations of gay men and lesbians elicit dramatically different results to the typically used category-based representations. In other words, the measured construct depends strongly on the context of the measurement. We interpret this as evidence that stimuli choice can reflect which aspects of the construct of gay are being considered (i.e., attitudes toward gay couples or same-sex marriage compared to attitudes toward a gay person) and highlights the importance of stimuli selection. Researchers that are interested specifically in implicit attitudes toward gay people, rather than broad and abstract issues of a homosexuality, may prefer to use a person-based approach to implicit representation. Furthermore, the person-based approach allows for a simpler and more parsimonious interpretation of any findings.

The findings presented in this paper allow us to suggest three clear guidelines for future implicit sexual prejudice research. First, the findings demonstrate that gay men and lesbians are distinct enough to invalidate the use of unisex representations that were common in early implicit sexual prejudice research (Banse et al., 2001; Boysen & Vogel, 2008; Boysen et al., 2006; Gabriel et al., 2007; Inbar et al., 2009). Second, the inclusion of participant factors such as participants' own sexuality and gender have important effects on implicit

sexuality-based attitudes. Finally, the person-based approach overcomes methodological difficulties of representing these groups and addresses the confounds that arise from the use of symbols which involve more than just sexuality.

Finally, the findings of the current experiment highlight the importance of measurement issues in understanding implicit sexual prejudice, resulting from the unique challenges of assessing a social category that is not visually identifiable (Freeman et al., 2010). Furthermore, we suggest that given the replicable, but unique results of the person-based approach, there is reason to reconsider the interpretations of the results from category-based representation of gay men and lesbians. That is, we are not suggesting that the existing research into implicit sexual prejudice is incorrect, but we are arguing that the existing literature may have only been measuring a very specific (and over inclusive) version of implicit sexual prejudice. In conclusion, the current research provides initial evidence for the person-based approach in implicit sexual prejudice and group-bias research, as well as clear directions for the future studies that focus on presenting evidence for its validity and utility.

Notes

1. Detection of sexual orientation from visual (face) cues is at around 60% (see Rule, 2017) but the accuracy rate varies based on the presence of gendered or stereotypical cues (see Cox et al., 2016; Lick & Johnson, 2016). While this is above chance, it is substantially lower than the accuracy of the detection of gender from the same cues.
2. We note that only our Australian participants were involved in the experiments using famous face stimuli, and that the Swiss participants were involved in the experiments using novel stimuli.

Disclosure statement

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethics

The human research ethics committee at Australian Catholic University and the ethics commission at the University of Geneva reviewed the protocols for these experiments.

References

Allport, G. W. (1954). *The nature of prejudice.* Reading.

Anderson, J. R., & Antalíková, R. (2014). Framing (implicitly) matters: The role of religion in attitudes toward immigrants and Muslims in Denmark. *Scandinavian Journal of Psychology*, *55*(6), 593–600. https://doi.org/10.1111/sjop.12161

Anderson, J. R., & Koc, Y. (2015). Exploring patterns of explicit and implicit anti-gay attitudes in Muslims and Atheists. *European Journal of Social Psychology*, *45*(6), 687–701. https://doi.org/10.1002/ejsp.2126

Anderson, J. R., Koc, Y., & Falomir-Pichastor, J. M. (2018). The english version of the attitudes toward homosexuality scale. *Swiss Journal of Psychology*, *77*(3), 117–126. https://doi.org/10.1024/1421-0185/a000210

Anselmi, P., Vianello, M., Voci, A., Robusto, E., & Denson, T. (2013). Implicit sexual attitude of heterosexual, gay and bisexual individuals: Disentangling the contribution of specific associations to the overall measure. *PloS One*, *8*(11), e78990. https://doi.org/10.1371/journal.pone.0078990

Anselmi, P., Voci, A., Vianello, M., & Robusto, E. (2015). Implicit and explicit sexual attitudes across genders and sexual orientations. *Journal of Bisexuality*, *15*(1), 40–56. https://doi.org/10.1080/15299716.2014.986597

Banse, R., Seise, J., & Zerbes, N. (2001). Implicit attitudes towards homosexuality: Reliability, validity, and controllability of the IAT. *Zeitschrift für experimentelle Psychologie*, *48*, 145–160. https://doi.org/10.1026//0949-3946.48.2.145

Bluemke, M., & Friese, M. (2006). Do features of stimuli influence IAT effects? *Journal of Experimental Social Psychology*, *42*(2), 163–176. https://doi.org/10.1016/j.jesp.2005.03.004

Boysen, G. A., & Vogel, D. L. (2008). Education and mental health stigma: The effects of attribution, biased assimilation, and attitude polarization. *Journal of Social and Clinical Psychology*, *27*(5), 447–470. https://doi.org/10.1521/jscp.2008.27.5.447

Boysen, G. A., Vogel, D. L., & Madon, S. (2006). A public versus private administration of the implicit association test. *European Journal of Social Psychology*, *36*(6), 845–856. https://doi.org/10.1002/ejsp.318

Breen, A. B., & Karpinski, A. (2013). Implicit and explicit attitudes toward gay males and lesbians among heterosexual males and females. *The Journal of Social Psychology*, *153*(3), 351–374. https://doi.org/10.1080/00224545.2012.739581

Cárdenas, M., & Barrientos, J. (2008). Actitudes Explícitas e Implícitas hacia los Hombres Homosexuales en una Muestra de Estudiantes Universitarios en Chile. *Psykhe (Santiago)*, *17*(2), 17–25. https://doi.org/10.4067/S0718-22282008000200002

Cochran, B. N., Peavy, K. M., & Cauce, A. M. (2007). Substance abuse treatment providers' explicit and implicit attitudes regarding sexual minorities. *Journal of Homosexuality*, *53*(3), 181–207. https://doi.org/10.1300/J082v53n03_10

Cowling, M., & Anderson, J. R. (2018). The role of Christianity and Islam in explaining prejudice against asylum seekers: Evidence from Malaysia. *The International Journal for the Psychology of Religion*. https://doi.org/10.1080/10508619.2019.1567242 29 (2) 108–127

Cox, W. T., Devine, P. G., Bischmann, A. A., & Hyde, J. S. (2016). Inferences about sexual orientation: The roles of stereotypes, faces, and the gaydar myth. *Journal of Sex Research*, 53 (2), 157–171. https://doi.org/10.1080/00224499.2015.1015714

Crisp, R. J., & Hewstone, M. (2007). Multiple social categorization. *Advances in Experimental Social Psychology*, 39, 163–254. https://doi.org/10.1016/S0065-2601(06)39004-1

Cullen, C., & Barnes-Holmes, D. (2008). Implicit pride and prejudice: A heterosexual phenomenon. In T. J. Morrison & M. A. Morrison (Eds.), *Modern prejudice* (pp. 195–223). Nova Science.

Dasgupta, N., McGhee, D. E., Greenwald, A. G., & Banaji, M. R. (2000). Automatic preference for white Americans: Eliminating the familiarity explanation. *Journal of Experimental Social Psychology*, 36, 316–328. https://doi.org/10.1006/jesp.1999.1418 3

Dasgupta, N., & Rivera, L. M. (2006). From automatic antigay prejudice to behavior: The moderating role of conscious beliefs about gender and behavioral control. *Journal of Personality and Social Psychology*, 91(2), 268–280. https://doi.org/10.1037/0022-3514.91.2.268

Dasgupta, N., & Rivera, L. M. (2008). When social context matters: The influence of long–term contact and short–term exposure to admired outgroup members on implicit attitudes and behavioral intentions. *Social Cognition*, 26, 112–123. https://doi.org/10.1521/soco.2008.26.1.112 1

Eagly, A. H., & Mladinic, A. (1994). Are people prejudiced against women? Some answers from research on attitudes, gender stereotypes, and judgments of competence. *European Review of Social Psychology*, 5(1), 1–35. https://doi.org/10.1080/14792779543000002

Ellis, H. (1915). *Sexual inversion* (Vol. 2). FA Davis Company.

Falomir-Pichastor, J. M., Berent, J., & Anderson, J. R. (2019). Perceived men's feminization and attitudes toward homosexuality: Heterosexual men's reactions to the decline of the anti-femininity norm of masculinity. *Sex Roles*, 81(3–4), 1–15. https://doi.org/10.1007/s11199-018-0985-6

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. https://doi.org/10.3758/BF03193146

Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, 54(1), 297–327. https://doi.org/10.1146/annurev.psych.54.101601.145225

Francis, W., & Kucera, H. (1982). *Frequency analysis of English usage*. Houghton Mifflin Company.

Freeman, J. B., Johnson, K. L., Ambady, N., & Rule, N. O. (2010). Sexual orientation perception involves gendered facial cues. *Personality and Social Psychology Bulletin*, 36(10), 1318–1331. https://doi.org/10.1177/0146167210378755

Freud, S. (1953). Three essays on the theory of sexuality (1905). In J. Strachey (Ed.), *The standard edition of the complete psychological works of sigmund Freud, Volume VII (1901-1905): A case of hysteria, three essays on sexuality and other works* (pp. 123–246). Hogarth Press.

Gabriel, U., Banse, R., & Hug, F. (2007). Predicting private and public helping behaviour by implicit attitudes and the motivation to control prejudiced reactions. *British Journal of Social Psycholology*, 46(2), 365–382. https://doi.org/10.1348/014466606X120400

Green, D. M., & Swets, J. A. (1966). *Signal detection theory and psychophysics* (Vol. 1). Wiley & Sons, Inc.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, *74*(6), 1464–1480. https://doi.org/10.1037/0022-3514.74.6.1464

Herek, G. M. (1984). Attitudes towards lesbians and gay men - a factor-analytic study. *Journal of Homosexuality*, *10*(1–2), 39–51. https://doi.org/10.1300/J082v10n01_03

Herek, G. M. (2004). Beyond "homophobia": Thinking about sexual prejudice and stigma in the twenty-first century. *Sexuality Research & Social Policy*, *1*(2), 6–24. https://doi.org/10.1525/srsp.2004.1.2.6

Herek, G. M., & Capitanio, J. P. (1996). "Some of my best friends": Intergroup contact, concealable stigma, and heterosexuals' attitudes toward gay men and lesbians. *Personality and Social Psychology Bulletin*, *22*(4), 412–424. https://doi.org/10.1177/0146167296224007

Iacoviello, V., Valsecchi, G., Berent, J., Anderson, J. R., & Falomir-Pichastor, J. M. (2019). Heterosexual men's attitudes towards homosexuality and ingroup distinctiveness: The role of perceived men's feminisation. *Psychology and Sexuality*, *11*(1–2), 45–61. https://doi.org/10.1080/19419899.2019.1675749

Inbar, Y., Pizarro, D. A., Knobe, J., & Bloom, P. (2009). Disgust sensitivity predicts intuitive disapproval of gays. *Emotion*, *9*(3), 435–439. https://doi.org/10.1037/a0015960

Jellison, W. A., McConnell, A. R., & Gabriel, S. (2004). Implicit and explicit measures of sexual orientation attitudes: In group preferences and related behaviors and beliefs among gay and straight men. *Personality and Social Psychology Bulletin*, *30*(5), 629–642. https://doi.org/10.1177/0146167203262076

Jonathan, E. (2008). The influence of religious fundamentalism, right-wing authoritarianism, and christian orthodoxy on explicit and implicit measures of attitudes toward homosexuals. *The International Journal for the Psychology of Religion*, *18*(4), 316–329. https://doi.org/10.1080/10508610802229262

Kite, M. E., & Deaux, K. (1987). Gender belief systems: Homosexuality and the implicit inversion theory. *Psychology of Women Quarterly*, *11*(1), 83–96. https://doi.org/10.1111/j.1471-6402.1987.tb00776.x

Lemm, K. M. (2006). Positive associations among interpersonal contact, motivation, and implicit and explicit attitudes toward gay men. *Journal of Homosexuality*, *51*(2), 79–99. https://doi.org/10.1300/J082v51n02_05

Lick, D. J., & Johnson, K. L. (2016). Straight until proven gay: A systematic bias toward straight categorizations in sexual orientation judgments. *Journal of Personality & Social Psychology*, *110*(6), 801–817. https://doi.org/10.1037/pspa0000052

Mitchell, J. P., Nosek, B. A., & Banaji, M. R. (2003). Contextual variations in implicit evaluation. *Journal of Experimental Psychology-General*, *132*(3), 455–469. https://doi.org/10.1037/0096-3445.132.3.455

Moor, L., Kapelles, T., Koc, Y., & Anderson, J. R. (2019). Predicting explicit and implicit attitudes towards gay men using the dualprocess model of prejudice and the dark tetrad. *Personality and Individual Differences*, *151*(6), 109486. https://doi.org/10.1016/j.paid.2019.06.029

Nosek, B. A., & Banaji, M. R. (2001). The go/no-go association task. *Social Cognition*, *19*, 625–666. https://doi.org/10.1521/soco.19.6.625.20886

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2005). Understanding and using the implicit association test: II. Method variables and construct validity. *Personality and Social Psychology Bulletin*, *31*(2), 166–180. https://doi.org/10.1177/0146167204271418

Richeson, J. A., & Ambady, N. (2001). Who's in charge? Effects of situational roles on automatic gender bias. *Sex Roles*, *44*(9/10), 493–512. https://doi.org/10.1023/A:1012242123824

Rohner, J. C., & Björklund, F. (2006). Do self-presentation concerns moderate the relationship between implicit and explicit homonegativity measures? *Scandinavian Journal of Psychology*, *47*(5), 379–385. https://doi.org/10.1111/j.1467-9450.2006.00522.x

Rowatt, W. C., LaBouff, J., Johnson, M., Froese, P., & Tsang, J. A. (2009). Associations among religiousness, social attitudes, and prejudice in a national random sample of american adults. *Psychology of Religion and Spirituality*, *1*(1), 14–24. https://doi.org/10.1037/a0014989

Rowatt, W. C., Tsang, J.-A., Kelly, J., LaMartina, B., McCullers, M., & McKinley, A. (2006). Associations between religious personality dimensions and implicit homosexual prejudice. *Journal for the Scientific Study of Religion*, *45*(3), 397–406. https://doi.org/10.1111/j.1468-5906.2006.00314.x

Rudman, L. A., & Goodwin, S. A. (2004). Gender differences in automatic in-group bias: Why do women like women more than men like men? *Journal of Personality and Social Psychology*, *87*(4), 494–509. https://doi.org/10.1037/0022-3514.87.4.494

Rule, N. O. (2017). Perceptions of sexual orientation from minimal cues. *Archives of Sexual Behavior*, *46*(1), 129–139. https://doi.org/10.1007/s10508-016-0779-2

Salvati, M., Passarelli, M., Chiorri, C., Baiocco, R., & Giacomantonio, M. (2021). Masculinity threat and implicit associations with feminine gay men: Sexual orientation, sexual stigma, and traditional masculinity. *Psychology of Men & Masculinities*, *22*(4), 649–668. https://doi.org/10.1037/men0000338

Smith, S. J., Axelton, A., & Saucier, D. (2009). The effects of contact on sexual prejudice: A meta-analysis. *Sex Roles*, *61*(3–4), 178–191. https://doi.org/10.1007/s11199-009-9627-3

Steffens, M. C. (2005). Implicit and explicit attitudes towards lesbians and gay men. *Journal of Homosexuality*, *49*(2), 39–66. https://doi.org/10.1300/J082v49n02_03

Steffens, M. C., & Buchner, A. (2003). Implicit association test: Separating transsituationally stable and variable components of attitudes toward gay men. *Experimental Psychology (formerly Zeitschrift für Experimentelle Psychologie)*, *50*(1), 33–48. https://doi.org/10.1027//1618-3169.50.1.33

Steffens, M. C., Kirschbaum, M., & Glados, P. (2008). Avoiding stimulus confounds in implicit association tests by using the concepts as stimuli. *British Journal of Social Psychology*, *47*(2), 217–243. https://doi.org/10.1348/014466607X226998

Thorndike, E. L. (1920). A constant error in psychological ratings. *Journal of Applied Psychology*, *4*(1), 25–29. https://doi.org/10.1037/h0071663

Tsang, J. A., & Rowatt, W. C. (2007). The relationship between religious orientation, right-wing authoritarianism, and implicit sexual prejudice. *The International Journal for the Psychology of Religion*, *17*(2), 99–120. https://doi.org/10.1080/10508610701244122

Valsecchi, G., Iacoviello, V., Berent, J., Anderson, J. R., Borinca, I., & Falomir-Pichastor, J. M. (2020). Gay-gender expression and attitudes toward gay people: The moderating role ofperceived men's feminization. *Psychology of Sexual Orientation and Gender Diversity*. Advanced online edition. https://doi.org/10.1037/sgd0000452

Westgate, E. C., Riskind, R. G., & Nosek, B. A. (2015). Implicit preferences for straight people over lesbian women and gay men weakened from 2006 to 2013. *Collabra Open Access Journal*, 1. https://doi.org/10.1525/collabra.18

Williams, B. J., & Kaufmann, L. M. (2012). Reliability of the Go/No Go Association task. *Journal of Experimental Social Psychology*, *48*(4), 879–891. https://doi.org/10.1016/j.jesp.2012.03.001