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ORIGINAL PAPER

Concealment of Sexual Orientation

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Abstract Sex-atypical behaviors may be used to identify a person as homosexual. To shield themselves from prejudice, homosexual people may attempt to conceal these behaviors. It is not clear how effectively they can do so. In Study 1, we asked homosexual participants to conceal their sex-atypical behaviors while talking about the weather. Raters watched videos of the participants and judged the likelihood that each participant was homosexual. Homosexual participants were able to partially conceal signs of their orientation, but they remained distinguishable from heterosexual participants. In Study 2, we tested the ability to conceal signs of one's sexual orientation in a more demanding situation: a mock job interview. In this scenario, homosexual men were even less effective at concealing their orientation. Higher cognitive demands in this new situation may have interfered with their ability to conceal.

Keywords Sexual orientation · Sex-typed behavior · Concealment · Cognitive load

Introduction

People who are perceived as homosexual often face harassment or discrimination (Badget, 1995; Berrill, 1992; Croteau & Von Destinom, 1994; Krieger & Sidney, 1997; Levine & Leonard, 1984; Mays & Cochran, 2001; Meyer, 2003). To avoid these consequences, they may sometimes try to pass as heterosexual by concealing behaviors that lead others to categorize them as homosexual; these may include sex-atypical speech patterns and motor behavior (Gaudio, 1994; Johnson, Gill, Reichman, & Tassinary, 2007; Rieger, Linsenmeier, Gygax, Garcia, & Bailey, 2009; Smyth, Jacobs, & Rogers, 2003; Travis, 1981). It is unclear, however, how successfully homosexual people can conceal these behaviors. In two studies, we investigated their ability to do so.

Sexual Orientation and Discrimination

It can be problematic to be perceived as homosexual. Long before they reach adulthood, many homosexual people learn that it may be advantageous to hide their sexual orientation from homophobic peers (Hetrick & Martin, 1987). Even after they "come out" as homosexual, they may not be "out" to everyone (Griffin, 1992). Homosexual adults are frequent targets of verbal harassment and threatened physical violence (Berrill, 1992). They may also face discrimination in the work force (Croteau & Von Destinom, 1994; Krieger & Sidney, 1997; Levine & Leonard, 1984). For example, homosexual people are four times as likely as heterosexuals to report being fired from a job because of perceived discrimination (Mays & Cochran, 2001). Further, nonheterosexual men earn 11–27% less than heterosexual men with similar qualifications (Badgett, 1995), probably because of discrimination against homosexuality. Therefore, like other stigmatized minorities, homosexual people may be constantly vigilant for cues that others are prejudiced against them (Crocker, Major, & Steele, 1998). It seems plausible that when prejudice is suspected, homosexual people sometimes try to conceal their orientation to avoid harassment or discrimination.

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Ability to Conceal

To our knowledge, only one study has investigated whether homosexual people can successfully conceal their sexual orientation (Ambady & Hallahan, 2002). In that study, 10 homosexual men and 10 lesbians were videotaped in three different conditions: behaving naturally, trying to pass as heterosexual, and exaggerating signs of their homosexual orientation. Each condition was compared to a control group of heterosexual people behaving naturally. One- and two-second movie clips were extracted and judged by a total of 80 raters. Here, we report averaged results for both clip lengths. Male sexual orientation (including both heterosexual and homosexual men) was judged correctly 57% of the time in both the natural and exaggerating conditions. However, male sexual orientation was judged correctly only 42% of the time when homosexual subjects tried to pass as heterosexual, which was a marginally significant decrease compared with the natural condition, $\chi^2(1) = 2.32, p = .12$. Female sexual orientation (including both heterosexual and homosexual women) was judged correctly 81% of the time in both the normal and exaggerating conditions. It was judged correctly 76% of the time when homosexual women were asked to try to pass as heterosexual, which was not a significant decrease compared with the natural condition, $\chi^2(1) = 0.44, p = .51$. In general, this study's results suggest only modest effects of attempts to conceal homosexuality.

One limitation of this study was the very brief behavioral samples available to raters. This may explain why male sexual orientation was rated so inaccurately, even in the unconcealed condition. A second limitation was the lack of information on how closely the behavior of homosexual participants trying to pass as straight resembled that of heterosexual participants. Ambady and Hallahan (2002) focused on whether sexual orientation of both heterosexual and homosexual participants was accurately judged, but they did not compare the behavior of the two groups. Thus, even though homosexual men could conceal their sexual orientation to some extent, it is not clear whether they remained distinguishable from heterosexual men.

Concealment and Cognitive Load

While trying to conceal their orientation, homosexual people sometimes need to accomplish other tasks, some of which may be relatively demanding. For example, they may have to excel at an intellectually challenging occupation or impress an important person. In such cognitively demanding situations, homosexuals might be less able to conceal their orientation.

In general, "cognitive loads" are demanding tasks that interfere with other effortful processes requiring cognitive resources. For example, cognitive loads disrupt effortful steps involved in perceiving oneself (Paulhus, Graf, & Van Selst, 1989; Swann, Hixon, Stein-Seroussi, & Gilbert, 1990) and perceiving others (Gilbert & Osborne, 1989; Gilbert, Pelham, & Krull, 1988). Further, effortful attempts to alter one's self-presentational style require cognitive resources (Baumeister, Hutton, & Tice, 1989; Tice, Butler, Muraven, & Stillwell, 1995). If other tasks are consuming these resources, effortful self-presentation strategies can fail (Paulhus, 1988; Pontari and Schlenker, 2000).

Pontari and Schlenker (2000) hypothesized that a cognitive load would impair effortful performances that contrast with one's personality (e.g., an extroverted person acting introverted), but would not affect relatively effortless performances in line with one's personality (e.g., an extroverted person acting extroverted). To test this, they asked highly extroverted and highly introverted participants to act in either an extroverted or an introverted way. Individual interviewers judged each participant on facets of extroversion and introversion. As expected, extroverted people had a harder time mimicking introverts when under a cognitive load (rehearsing an 8-digit number), while the load did not interfere with their attempts to act extroverted. Surprisingly, introverts were *better* at acting extroverted when under a cognitive load. Pontari and Schlenker subsequently found that introverts preparing to act extroverted had a variety of anxious thoughts about themselves, which may have functioned as a "natural" cognitive load. The experimental cognitive load reduced the frequency of these negative thoughts, possibly freeing introverts to act more extroverted. Though the results of Pontari and Schlenker are more complicated than proposed, overall they support the idea that effortful processes can be disturbed by a cognitive load.

Even if homosexual people can convincingly pass as heterosexual, this may be an effortful process. If so, cognitive demands may disrupt efforts to conceal signs of their sexual orientation. In a demanding situation, homosexual people may have a harder time passing as heterosexual, and may continue to emit cues that identify them as homosexual. Thus, the ability to conceal may vary from situation to situation, depending on cognitive demands. This may leave homosexual people uncertain of how well they will be able to conceal at any particular time.

Further, if demanding tasks can compromise concealment, concealment may sometimes compromise simultaneous performance on demanding tasks. Homosexual people may not only be uncertain of whether they will be able to conceal, but also uncertain of whether they will be able to pull off other important tasks while doing so. Concealment may already be a stressful process (Major & Gramzow, 1999), and all this uncertainty may only increase the stress.

Sexual Orientation and Sex Atypicality

Hiding one's sexual orientation involves more than just watching what one says. What other cues might homosexual people alter in order to conceal their sexual orientation? Previous research leads to the hypothesis that passing as heterosexual may involve concealing behaviors that are sex-atypical.

Homosexuality is associated with a distinctive speech pattern. Homosexual men's speech is perceived as more sex atypical, on average, than heterosexual men's speech (Gaudio, 1994; Rieger et al., 2009; Travis, 1981). Further, homosexual men's speech is more likely to be judged as homosexual (Bailey, 2003; Carahaly, 2000; Gaudio, 1994; Linville, 1988; Smyth et al., 2003). Lesbians' speech is also perceived as more homosexual than that of heterosexual women (Bailey, 2003; Carahaly, 2000; Rieger et al., 2009). Ratings of sex atypicality and ratings of sexual orientation based on speech samples correlate highly (Gaudio, 1994; Rieger et al., 2009; Smyth et al., 2003). This suggests that listeners use sex atypicality to infer homosexuality.

Homosexual people also tend to exhibit sex-atypical nonverbal behaviors. In several studies, researchers have digitally altered videos of participants, outlining their bodies and blurring other details to focus attention on posture, gesture, and motion. Raters who viewed only a few seconds of these digitally altered videos judged homosexual participants' nonverbal behavior as more sex atypical and as more homosexual than that of heterosexual subjects (Ambady, Hallahan, & Conner, 1999; Johnson et al., 2007; Rieger et al., 2009). In the study by Rieger et al. (2009), subjective ratings of sex atypicality and homosexuality correlated highly ($r >$ .80), and both of these ratings reliably predicted actual sexual orientation (r's $>$ .60). This suggests that raters also use sex-atypical nonverbal behaviors to infer homosexuality.

In sum, homosexual people tend to display sex-atypical speech patterns and nonverbal behaviors, which observers can use to identify their sexual orientation. In order to pass as heterosexual, they may have to alter these behaviors and act in a more sex-typical manner. Doing so may be an effortful process, making it difficult to pass as heterosexual when cognitive resources are scarce.

It is important to note that not every homosexual person speaks and moves in a sex-atypical way. Previous studies have found considerable variability in the sex atypicality of homosexual people's speech and nonverbal behaviors (Rieger et al., 2009; Smyth et al., 2003). Some homosexual people speak and move in a sex-typical manner and are indistinguishable from heterosexual people. Other homosexual people speak and move in a relatively sex-atypical manner, and they would need to alter their behavior in order to appear heterosexual. Thus, not all homosexual people have something to conceal.

On average, however, homosexual and heterosexual people tend to be distinguishable. It is unclear whether this average difference disappears when homosexual people are motivated to conceal their orientation.

The Present Research

The present research addresses two questions. First, how effectively can homosexual people conceal signs of their sexual orientation? Second, is their ability to conceal influenced by whether they are in a situation that is more cognitively demanding?

We conducted two studies that address these questions. In both studies, homosexual participants were asked to change their behavior to minimize cues to their sexual orientation, and we obtained ratings of how their sexual orientation was perceived. Ratings of homosexual participants asked to alter their behavior were compared to ratings of heterosexual people behaving naturally (that is, without any special instructions), to assess whether these groups were still distinguishable. In the first study, participants were asked to change their behavior while talking about the weather. In the second study, they were asked to change their behavior in a more demanding situation: a mock job interview.

We present the two studies separately and then compare results across studies. The studies were designed independently of each other and used somewhat different manipulations. In Study 1, homosexual participants were asked to conceal their sex-atypical behaviors, whereas in Study 2 homosexual participants were asked to conceal their homosexuality; in both studies, raters judged the likelihood that each participant was homosexual. In other aspects of their methodology, the two studies were very similar. Though they are not entirely comparable, a careful comparison of their findings is more informative than examining either study by itself.

Study 1

Method

Participants

We recruited two types of participants: "targets" and "raters." Targets were asked to either behave naturally or try to alter their behavior. Their behavior was videotaped, and raters later viewed videos of the targets and rated the likelihood that each target was homosexual.

Targets Targets were recruited through ads in a local alternative newspaper (*Chicago Reader*), a classified ad

website (Craigslist), and a local homosexual publication (*Gay Chicago*). The ads solicited homosexual or heterosexual men and women who were willing to be interviewed for a larger study on child development. Other findings from that study have been presented elsewhere (Rieger, Linsenmeier, Gygax, & Bailey, 2008). Although that article discusses ratings of targets behaving naturally, only the present article discusses ratings of targets when they were asked to alter their behavior.

Targets included 20 homosexual men, 20 lesbians, 18 heterosexual men, and 20 heterosexual women. Mean ages (with *SD*s) were 29.8 (8.0), 23.8 (5.6), 26.2 (6.1), and 26.2 (8.7). Lesbians were significantly younger than homosexual men, $p = .01$, $d = .86$. No other significant group differences in age were found. Eighty-two percent of targets were Caucasian. This proportion did not significantly differ across groups, $\chi^2(3) = 0.30$.

We recruited homosexual targets without screening for whether their speech and behavior were identifiably homosexual. Thus, some of our homosexual targets may have had nothing to conceal. However, we expected homosexual and heterosexual targets to be distinguishable, on average. We were interested in whether this average difference would disappear when homosexual targets tried to alter their behavior.

Raters Raters were drawn from an introductory psychology class. Students in this class were randomly assigned to complete different studies, such as the present study, for class credit. Twenty-nine heterosexual men and 32 heterosexual women from this class rated video clips of the targets. Mean ages (with *SD*s) were 18.8 (0.9) and 18.7 (1.1), respectively. The proportion of Caucasians was higher among male raters (72%) than among female raters (44%), $\chi^2(1) = 5.21$, $p = .02$. Because ratings of the two groups hardly differed and were highly correlated (see below), differences in ethnicity did not seem to have a major influence on ratings.

Procedure

Stimulus Creation All targets were videotaped during an informal interview. Towards the end of the interview, they were asked to describe winters in the Midwest. After targets had answered this question, they were asked to repeat the answer once in a more feminine way and once in a more masculine way. Targets were encouraged to believably imitate the behaviors of a naturally feminine woman or a naturally masculine man. They were also encouraged to give approximately the same answer in the masculine and feminine condition as they did when they behaved naturally. We did not tell them how to appear more feminine or more masculine, but left that to their discretion. They were told that this was for a study of the perception of sex-typed behaviors, and we were curious whether either their natural or their altered behaviors would be related to their self-identified sexual orientation.

To prepare the video stimuli, we used all complete sentences produced by the targets within the first 30 seconds of their answer. Selected video clips were between 10 and 20 seconds long. Previous research has shown that differences between homosexual and heterosexual people can be reliably detected using such short video clips (e.g., Ambady et al., 1999).

Ratings Ratings were done separately for six sets of movies, three for each target sex. In each set, each target was shown in only one condition: natural, more masculine, or more feminine. Within a set, there were approximately equal numbers of targets in each condition. Targets were presented in random order.

Similar numbers of heterosexual men and women watched each of the six movie sets. Each rater watched two sets of movies, one for each target sex. Raters were asked to evaluate what each target's sexual orientation appeared to be. To answer, they were instructed to pick a number from 1 to 7. Higher numbers meant the target was more likely to be homosexual; lower numbers meant the target was more likely to be heterosexual. Raters received no explicit information about the targets' sexual orientation, and they were not told that some targets were acting.

Data Analysis

We performed two sets of multiple regression analyses. First, we tested whether instructions to act in a more sex-typical or sex-atypical manner would change how targets were perceived. To do this, we used target sexual orientation (heterosexual or homosexual), condition (act sex-typically, behave naturally, or act sex-atypically), and the interaction of these factors to predict ratings of targets' sexual orientation. We included targets as a random factor to account for repeated measures of targets across the three conditions. Analyses were done separately for male and female targets.

Second, we tested whether homosexual targets instructed to act in a more sex-typical manner would still be distinguishable from heterosexual targets behaving naturally. To do this, we performed a regression analysis comparing these two groups, with target sex entered as an additional predictor to test for possible sex differences in the effect.

Since we included multiple predictors and interactions in each of our analyses, we report standardized beta weights as a common measure of effect size. Beta weights reflect the number of standard deviations of change in the dependent variable produced by a one *SD* change in the independent variable. For ease of interpretation, we also report Cohen's *d*

for the analogous simple comparisons where this statistic can be calculated.

Our analyses tested for average differences between groups and conditions. Accordingly, the results describe average differences in behavior. These differences were not necessarily true of each individual target.

Results and Discussion

Inter-Rater Consistency

The two groups of raters, heterosexual men and women, showed high correlations between their ratings of sexual orientation in all three conditions (sex atypical, sex typical, natural); all r's $\geq .9$ for both male and female targets. In addition, the two groups of raters did not differ substantially in how well their ratings were correlated with the targets' sexual orientation, $p = .18$, $\beta = .03$. Across all raters, inter-rater reliability (Cronbach's alpha) exceeded .95 for each condition and within each target sex. Thus, for each stimulus, the average rating of perceived sexual orientation across all raters was used for subsequent analyses.

How Concealable is Sexual Orientation?

We first tested for main effects of sexual orientation and experimental condition, as well as any interactions of these factors. Figure 1 shows that there was a significant main effect of target sexual orientation. Overall, homosexual targets were rated as more likely to be homosexual, for males, $p < .0001$, $\beta = .46$, $d = 1.0$ and for females, $p = .0006$, $\beta = .48$, $d = 1.1$. There was also a significant main effect of condition, in males, $p < .0001$, $\beta = .56$, and females, $p < .0001$, $\beta = .18$. Targets appeared most likely to be heterosexual in the sex-typical condition and most likely to be homosexual in the sex-atypical condition. All three conditions significantly differed from one another in men. In women, the sex-typical and natural conditions did not differ, but the other conditions did differ. In men, there was a significant interaction of target orientation and condition. The between-condition differences were larger in homosexual men than in heterosexual men, $p = .002$, $\beta = .16$. However, they were significant in both homosexual and heterosexual men, $p < .0001$, $\beta = .77$; $p < .0001$, $\beta = .48$. Thus, in general, targets changed their behaviors according to the conditions, but overall, homosexual targets appeared more likely to be homosexual than did heterosexual targets (Table 1).

Our crucial analyses focused on whether homosexual targets instructed to act sex-typically were still distinguishable from heterosexual targets behaving naturally. The shaded areas in Fig. 1 highlight this comparison. When homosexual targets were instructed to act more sex-typically, they were still perceived as more likely to be homosexual than were naturally behaving heterosexuals, $p = .002$, $\beta = .35$,

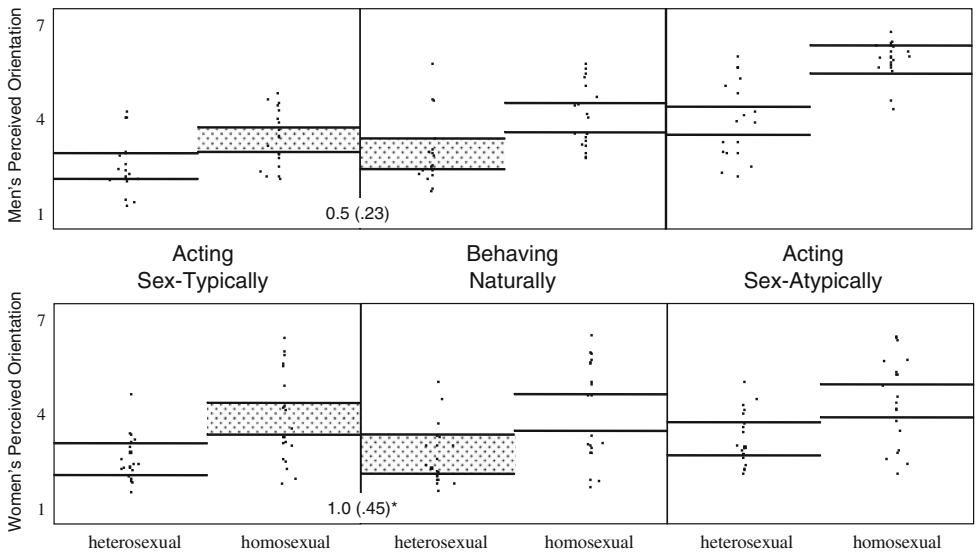

Fig. 1 Observer ratings of sexual orientation of heterosexual and homosexual male and female targets. Higher numbers mean the target was perceived as more likely to be homosexual; lower numbers suggest the target was perceived as more likely to be heterosexual. Each target was rated in three conditions: acting very sex-typically, behaving naturally, and acting very sex-atypically. Each point represents a target's average score across all raters who saw the target in the relevant condition. Lines are the 95% confidence intervals of the group means. On the Y-axis, a rating of 1 suggests the target was perceived as very likely to be heterosexual, while a rating of 7 suggests the target was perceived as very likely to be homosexual. The shaded areas highlight our main comparison: between homosexual people acting sex-typically and heterosexual people behaving naturally. Numbers are effect sizes of this comparison expressed as Cohen's d's and, in parentheses, as correlation coefficients. *$p < .05$

Table 1 Observer ratings of targets' orientation in Study 1

Condition	Male targets				Female targets			
	Heterosexual		Homosexual		Heterosexual		Homosexual	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Sex-typical	2.50	0.88	3.34	0.89	2.56	0.72	3.85	1.43
Natural	2.90	1.07	4.05	0.98	2.66	0.93	4.03	1.56
Sex-atypical	3.93	1.24	5.89	0.59	3.21	0.82	4.42	1.40

Note: Average ratings (with standard deviations) of the sexual orientation of each group of targets in each condition. Ratings are on a seven-point scale. An average rating of 1 means that targets in a group appeared very likely to be heterosexual, while an average rating of 7 means that targets in a group appeared very likely to be homosexual

$d = .75$. Thus, in general, homosexual targets did not fully conceal their orientation.

From visual inspection of the shaded areas in Fig. 1, it seemed that lesbians, especially, were distinguishable from heterosexual female targets, even when instructed to act more sex-typically. Indeed, the effect was significant only for female targets, $p = .003$, $\beta = .45$, $d = .99$; for male targets, the effect was non-significant, $p = .17$, $\beta = .23$, $d = .45$. However, the sex difference in effect, as indicated by the interaction of sex and sexual orientation, was non-significant, $p = .14$, $\beta = .16$.

Figure 1 also suggests that there was more variation in ratings of lesbian targets instructed to act sex-typically than of heterosexual female targets behaving naturally. A Levene test for unequal variance, which compared the magnitude of absolute residuals, indicated that this sexual orientation difference in variance was significant, $p = .02$, $\beta = .36$. Some lesbian targets appeared heterosexual when instructed to act sex-typically, but other lesbians whose sexual orientation was still identifiable counterbalanced them. Homosexual men instructed to act sex-typically did not show greater variation than heterosexual men behaving naturally, $p = .97$, $\beta = -.01$.

In sum, homosexual participants were able to change their perceived orientation somewhat. However, they were still distinguishable from heterosexual participants.

Study 2

Though homosexual people were able to alter their behavior to some extent while talking about the weather, it may be harder to conceal signs of their orientation in a more cognitively demanding situation. One relevant, often demanding, situation is a job interview. This situation was simulated in Study 2 in order to explore the effect of cognitive demands on the ability to conceal behavioral cues to homosexual orientation.

Method

Participants

Targets A subset of targets from Study 1 also participated in Study 2. Not all targets participated in Study 2 because this study was begun after Study 1 was already in progress. Thus, some targets did not have the opportunity to participate in the full experimental procedure, which included both studies.

Targets participating in Study 2 included 16 homosexual men, 13 lesbians, 16 heterosexual men, and 14 heterosexual women. Mean ages (with *SD*s) were 29.8 (8.8), 23.8 (6.3), 26.6 (6.4), and 27.6 (10.3). Lesbians were significantly younger than homosexual men, $p = .04$, $d = .79$. No other significant group differences in age were found. Eighty-six percent of targets were Caucasian. This proportion did not significantly differ across groups, $\chi^2(3) = 4.78$.

Raters Eighteen heterosexual men and 20 heterosexual women from an introductory psychology class were randomly assigned to view and rate video clips of targets participating in Study 2. Mean ages (with *SD*s) of male and female raters were 19.1 (0.86) and 18.8 (0.79). The sexes did not significantly differ in age, $p = .18$, $\beta = -.22$. Sixty-five percent were Caucasian. This proportion did not differ by rater sex, $\chi^2(1) = 0.46$. These raters were not exposed to any of the Study 1 stimuli.

Procedure

Stimulus Creation Targets were videotaped role-playing a job interview for their "dream job." Each homosexual target was asked to imagine talking separately with two different interviewers (who were, in reality, played by the same experimenter). One interviewer was described as a very accepting individual who would judge them fairly, regardless of their sexual orientation; thus, homosexual participants should feel free to be themselves. Targets' responses to this interviewer were filmed and used for the "behaving naturally" condition. The other interviewer was described as a homophobic person who would not want to hire homosexual people. Homosexual targets were reminded that this was their "dream job," and were instructed to "act straight" in order to get the job. Targets' responses to this interviewer were filmed and used for the "acting straight" condition. We did not tell them how to "act straight," but left that to their discretion. Participants were asked to take the interviews seriously. Interviewer order was counterbalanced across targets.

Heterosexual targets faced only the accepting interviewer and were instructed just to be themselves. Ratings of their natural behaviors were then used as a comparison for homosexual targets in the behaving naturally and acting straight conditions.

Targets were asked difficult questions that might be used during a job interview. These questions included "Describe your leadership style," "How do you handle conflict?," "What are your team-player qualities?," and "What was the most useful criticism you ever received, and what did you do about it?" For each target, one of these questions was randomly selected for the "behaving naturally" condition. For each homosexual target, one of the remaining questions was randomly selected for the "acting straight" condition.

Ratings Raters saw each target in only one condition. Each rater saw approximately half of the homosexual targets behaving naturally, about half of the homosexual targets instructed to act straight, and all of the heterosexual targets behaving naturally. Raters viewed all targets of one sex (presented in random order) and then all targets of the other sex (presented in random order). Raters viewed the video clips and judged the likelihood each target was homosexual, using the same scales as in Study 1.

Raters saw the last ten seconds of targets' responses. Since many targets emitted relatively few words during the first ten seconds, we used the last ten seconds instead of the first seconds of their answers.

Data Analysis

Our design included homosexual targets asked to behave naturally or to act straight, as well as heterosexual targets asked to behave naturally. We did not ask heterosexual targets to act gay. Because we did not have a balanced factorial design, we could not conduct a traditional factorial analysis as we did in Study 1. Instead, we used regression analyses to conduct three planned comparisons. First, we compared homosexual and heterosexual targets behaving naturally, to see if they were initially distinguishable. Second, we compared homosexual targets behaving naturally and instructed to act straight, to see if they were perceived differently depending on condition. Third, we compared homosexual targets instructed to act straight to heterosexual targets behaving naturally, to check if the two groups were still distinguishable. Target sex was included as an additional predictor in each analysis, to test for possible sex differences in effects.

Results

Inter-Rater Consistency

Both female and male raters' judgments correlated with a binary variable reflecting targets' actual orientations: $r(58) = .33$, $p = .001$ for female raters, $r(58) = .23$, $p = .008$ for male raters. Female raters' judgments were more correlated with targets' actual sexual orientations than were male raters' judgments, $p = .02$, $\beta = .39$. However, male and female raters' judgments of targets behaving naturally were highly correlated with each other; $r(30) = .93$, $p < .0001$ for male targets and $r(26) = .93$, $p < .0001$ for female targets. Their ratings of homosexual targets instructed to act straight were also highly correlated: $r(14) = .83$, $p < .0001$ for male targets, and $r(12) = .87$, $p < .0001$ for female targets. Across all raters (and, for homosexual targets, in each condition), inter-rater reliability (alpha) exceeded .93. Thus, for subsequent analyses, we used the average rating of each video clip across all raters.

How Concealable are Cues to Sexual Orientation?

When instructed to behave naturally, homosexual targets were perceived as significantly more likely to be homosexual than were heterosexual targets, $p = .001$, $\beta = .41$, $d = .89$. The sex difference in this effect was non-significant, $p = .77$, $\beta = .04$. Regardless of sex, homosexual targets were judged as more likely to be homosexual (Fig. 2).

Homosexual targets' perceived likelihood of being homosexual did not significantly change depending on whether they were asked to conceal their orientation, $p = .93$, $\beta = .005$, $d = .003$. When instructed to act straight, homosexual targets were still perceived as significantly more likely to be homosexual than were heterosexual targets behaving naturally, $p = .001$, $\beta = .43$, $d = .93$. The shaded areas in Fig. 2 highlight this effect, which did not differ by sex, $p = .97$, $\beta = .004$. Even when acting straight, homosexual targets of both sexes remained distinguishable from their heterosexual counterparts. Thus, Study 2 found no evidence that targets were able to change how their orientation was perceived (Table 2).

Comparing Studies 1 and 2

Study 1 found that targets could partially conceal cues to their sexual orientation, but they were still distinguishable from heterosexual targets. Study 2 found no evidence that homosexual targets could conceal their sexual orientation. Thus, in both studies, when homosexual targets tried to conceal cues to their orientation, they were still differentiable from heterosexual targets. However, results also suggested that there might be differences in behavior between the two studies.

All targets of Study 2 also participated in Study 1. We therefore conducted a series of within-participants analyses (treating targets as a random factor) to compare their behavior across studies. We were particularly interested in whether homosexual male targets were less effective at concealing in the "acting straight" condition of Study 2 than in the comparable "acting sex-typically" condition of Study 1.

To determine this, we examined whether the difference in behavior between homosexual targets instructed to conceal

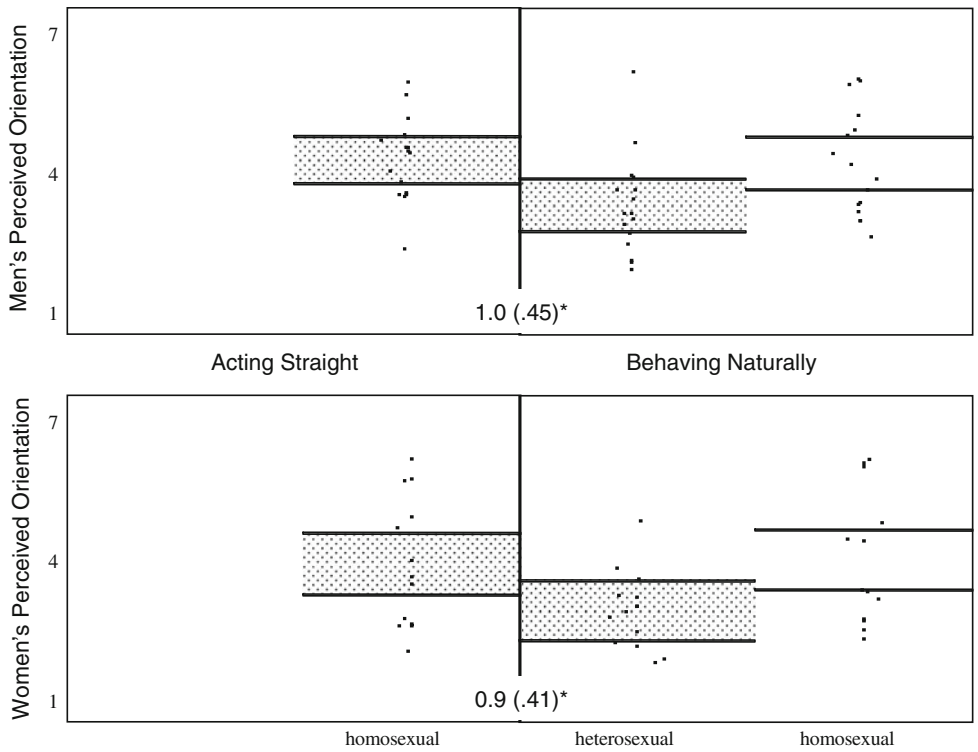

Fig. 2 Observer ratings of sexual orientation of heterosexual and homosexual male and female targets. Higher numbers mean the target was perceived as more likely to be homosexual; lower numbers suggest the target was perceived as more likely to be heterosexual. Homosexual targets were rated in two conditions: acting straight and behaving naturally. They were compared to heterosexual targets behaving naturally. Each point represents a target's average score across all raters who saw the target in the relevant condition. Lines are the 95% confidence intervals of the group means. On the Y-axis, a rating of 1 suggests the target was perceived as very likely to be heterosexual, while a rating of 7 suggests the target was perceived as very likely to be homosexual. The shaded areas highlight our main comparison: between homosexual people acting straight and heterosexual people behaving naturally. Numbers represent the effect sizes of this comparison expressed as Cohen's *d*'s and, in parentheses, as correlation coefficients. $^{*}p < .05$

Table 2 Observer ratings of targets' orientation in Study 2

Condition	Male targets				Female targets			
	Heterosexual		Homosexual		Heterosexual		Homosexual	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Acting straight			4.25	0.91			3.89	1.40
Behaving naturally	3.28	1.07	4.19	1.15	2.90	0.82	3.98	1.42

Note: Average ratings (with standard deviations) of the sexual orientation of each group of targets in each condition. Ratings are on a seven-point scale. An average rating of 1 means that targets in a group appeared very likely to be heterosexual, while an average rating of 7 means that targets in a group appeared very likely to be homosexual

and heterosexual targets behaving naturally was significantly larger in Study 2. We performed a regression analysis comparing these two groups of targets, with study entered as an additional predictor. A two-way interaction of target group and study would indicate that the difference between these target groups was larger in one of the studies. Target sex was also entered as a predictor, to check for sex differences in the effect.

Overall, we did not find a two-way interaction of target group and study, $p = .34$, $\beta = .04$. However, this finding differed by target sex, $p = .05$, $\beta = .07$. There was no two-way interaction among female targets, $p = .46$, $\beta = .03$. We did find a two-way interaction among male targets, $p = .05$, $\beta = .12$. The difference between homosexual men instructed to conceal and heterosexual men behaving naturally was significantly larger in Study 2 than in Study 1.

Specifically, homosexual men were rated as significantly more likely to be homosexual in the "acting straight" condition of Study 2 than in the corresponding condition of Study 1, $p = .0004$, $\beta = .42$, $d = .91$. In contrast, heterosexual

men behaving naturally were perceived similarly in the two studies, $p = .11$, $\beta = .15$, $d = .28$. Thus, homosexual men were less effective at concealing their orientation in Study 2 than in Study 1. Homosexual women were similarly ineffective at concealing their orientation in both studies.

To illustrate these results, we graphed each target's contrast score: the difference between his or her average rating in the two studies. Positive contrast scores indicate being rated as more likely to be homosexual in Study 2 than Study 1, and negative scores indicate the reverse. Figure 3 shows that when asked to conceal signs of their orientation, homosexual men remained significantly more identifiable in Study 2 than in Study 1. Their average contrast score was small (.82) but significantly greater than zero, $p = .0004$, $d_{\text{within}} = 1.1$. (The effect size, d_{within}, equals the average contrast score divided by the *SD* of the contrast scores.) In comparison, naturally behaving heterosexual men did not significantly differ between studies. Their average contrast score (.31) was not significantly different from zero, $p = .11$, $d_{\text{within}} = 0.4$. Naturally behaving homosexual men were also rated similarly in both studies: their average contrast score (.01) was not significantly different from zero, $p = .96$, $d_{\text{within}} = 0.01$. Again, these results suggest that homosexual men may have been less able to conceal signs of their orientation in Study 2. None of the contrast scores of women were significantly different from zero, suggesting that women were similarly unable to conceal signs of their orientation in both studies.

General Discussion

In both of our studies, homosexual people were perceived as more likely to be homosexual than were heterosexual people. In Study 1, homosexual men were able to partially conceal their orientation. However, they did not do this as well in Study 2, suggesting that cognitively demanding situations may impair attempts to conceal one's sexual orientation.

Effects of Cognitive Demands

Experimentally induced cognitive demands tend to interfere with other tasks that require conscious attention. For example, previous studies have asked participants to rehearse long numbers or word strings, or made them worry about an impending activity (Gilbert et al., 1988; Swann et al., 1990). As a result, they were unable to process feedback or correct their judgments about another person. Similarly, our second study asked participants to answer difficult questions supposedly presented by a job interviewer whose evaluation could have important consequences. Trying to do so likely demanded substantial attention. This may have decreased homosexual participants' ability to conceal their sexual orientation relative to Study 1, where they were simply asked to talk about the weather.

The effect of cognitive demands on a behavior may be a rough indication of how automatic versus effortful this behavior is. According to Gilbert and Osborne (1989), relatively automatic processes require little conscious attention. Even if a person's attention is elsewhere, automatic processes can proceed unimpeded. In the present research, homosexual men behaving naturally appeared similarly likely to be homosexual in both studies; the difference between studies in their natural behavior was not significant. Thus, the extra cognitive demands of Study 2 did not affect their natural behavior. This suggests that the naturally occurring behaviors that could identify them as homosexual may be relatively automatic. In contrast, homosexual participants' attempts to conceal their orientation were less effective in the more demanding Study 2. Controlling the sex-atypical behaviors that could identify them as homosexual may be a more effortful process and thus vulnerable to disruption by other cognitive demands.

Alternative Interpretations

The two studies were designed separately, and thus differed in more than one respect. As a result, several other interpretations are possible for the pattern of results we obtained.

For example, Study 2 may have made homosexual participants more anxious than Study 1. Study 2 raised the possibility that a homophobic person might discover their orientation. If this happened, or if they answered the interview questions poorly, they would supposedly be denied a highly desirable job. To the extent that our role-playing evoked the situation it was meant to simulate, it may have generated some anxiety. This anxiety may have been responsible for impairing attempts to conceal in Study 2.

However, one influential theory of anxiety suggests that its mechanism of action is not fundamentally different from that of cognitive load. According to Processing Efficiency Theory, anxious thoughts can reduce the available capacity of working memory (Eysenck & Calvo, 1992). Anxious thoughts may also consume attentional resources (Sarason, 1988). As a result, anxious thoughts can make it harder to complete effortful tasks that rely on working memory, attention, or both. Thus, anxious thoughts may interfere with effortful tasks in much the same way as do cognitive loads. Though the jury is still out on exactly how anxiety influences performance, this theory has received substantial empirical support (Calvo, Eysenck, Ramos, & Jiminez, 1994; Eysenck, 1996; Williams, Vickers, & Rodrigues, 2002; Wilson, Smith, & Holmes, 2007).

Another possibility is that some homosexual targets may have interpreted the instructions for the two studies as calling for different amounts of behavioral change. In Study 1, we

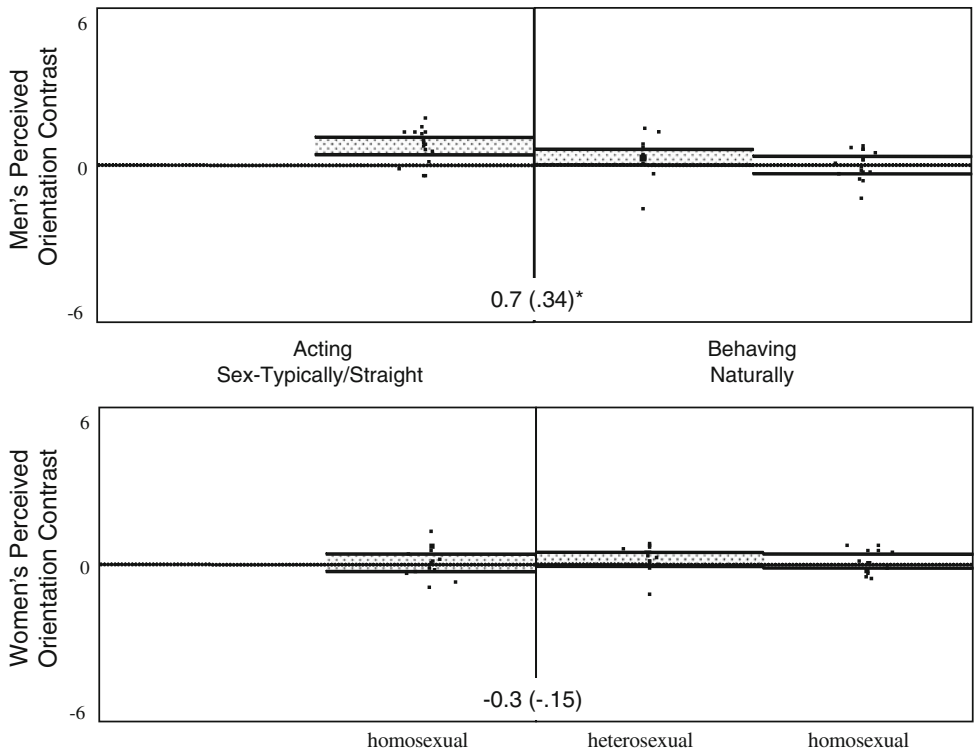

Fig. 3 Contrast scores (Study 2 minus Study 1), based on average observer ratings of sexual orientation of heterosexual and homosexual male and female targets. Contrast scores are shown for targets behaving naturally, and, for homosexual targets, for targets attempting to conceal signs of their sexual orientation (that is, acting sex-typically in Study 1, and acting "straight" in Study 2). Points represent the contrast scores of individual targets. Lines are the 95% confidence intervals of the group means. On the Y-axis, a score of 6 indicates receiving the highest possible sexual orientation score in Study 2 and the lowest possible in Study 1; a score of -6 indicates the reverse. The shaded areas highlight our main comparison: between homosexual people attempting to conceal signs of their orientation and heterosexual people behaving naturally. Numbers are effect sizes of this comparison expressed as Cohen's *d*'s and, in parentheses, as correlation coefficients. $*p < .05$

asked homosexual targets to act in a more masculine or more feminine manner than they naturally did, while in Study 2, we asked them to "act straight." It is possible that some of the homosexual targets were distinguishable from heterosexual targets, but falsely believed that they were indistinguishable. As a result, they may have seen little need to change their natural behavior in order to comply with the Study 2 instructions to "act straight." They may have been perfectly capable of changing their behavior, as demonstrated in Study 1, but failed to realize that any change was necessary in order to pass as straight.

Alternatively, homosexual targets may have been less willing to conceal their orientation in Study 2 than in Study 1. Study 2 asked them to conceal their sexual orientation because a person in a position of power was homophobic. Some homosexual targets may have been offended by this situation and reluctant to comply. Thus, the smaller effect of acting in Study 2 could represent a lack of motivation rather than a lack of ability. Although we have no indication that this was the case, this potential limitation should be avoided in future research.

It is possible that the order of the studies may have influenced the results. Study 2 participants also participated in Study 1 during the same experimental session, and they typically did so before completing Study 2. Thus, we cannot rule out an order effect.

Finally, both of our studies may have had a slight bias toward finding an inability to conceal. Homosexual people who have a hard time concealing their orientation may tend to be more open about their orientation, and may thus be more likely to respond to advertisements seeking homosexual participants for research. Thus, there was some risk of self-selection influencing our results. Though we could not entirely eliminate this risk, we tried to minimize it by recruiting participants for a larger study on child development, rather than explicitly recruiting participants for a study on the concealment of sexual orientation.

Future Directions

The present research suggests that although homosexual people may generally be able to conceal some behaviors related to their sexual orientation, their ability to do so may be impaired in cognitively demanding situations. Future research could directly test this possibility by manipulating cognitive demands and holding all other factors constant.

In addition, future research could investigate which signs of sexual orientation are most easily concealed. For example, there are heterosexual-homosexual differences in both speech patterns and nonverbal motor behavior (e.g., Rieger et al., 2009), and studies could address the degree to which each of these components is concealable. Research by Rieger et al. also suggests that heterosexual and homosexual people may differ in the sex atypicality of the content of responses to certain questions; that is, the content of responses given by homosexual people may be more similar to typical responses given by those of the other sex. Research might therefore investigate ability to control the sex-typed content of responses while one attempts to pass as heterosexual.

The present research focuses on group-level results. However, there was considerable individual variation in the ability to conceal. Future research should test different explanations for this variability. For example, some individuals may be more talented at acting in general. Clinically, many sex-atypical boys have been observed to have considerable skill at role-playing, readily switching their behavior as they adapt different roles (Green & Money, 1966). Because sex-atypical boys are more likely than other boys to grow up to be homosexual (Green, 1987), it is possible that a subset of gay men have a particular talent for acting. If so, their general acting skill might make them better at concealing behavioral markers of their sexual orientation. Though we do not have data on our participants' general acting ability, this is an interesting hypothesis for future research.

Even if two homosexual individuals are equally able to conceal their orientation, they may differ in motivation to do so. This may be a partly a function of individual differences in self-monitoring. This personality trait reflects the consistency of one's behavior from situation to situation. High self-monitors tend to adjust their behavior markedly according to situational demands, while low self-monitors tend to display the same behavioral patterns regardless of situation (Snyder, 1974). Self-report measures of self-monitoring have been shown to predict the extent to which many types of behavior are modified based upon the situation. For example, high self-monitors tend to adjust their masculine or feminine behaviors. In ordinary dyadic interactions, high self-monitors tend to show more sex-typical expressive patterns than low self-monitors, which may reflect heightened conformity to sex roles (Ickes & Barnes, 1977). In situations where feminine behavior is expected of both sexes, high self-monitors of both sexes may conform to this norm more than low self-monitors (Lippa, Valdez, & Jolly, 1983). Since many behaviors tend to be perceived as both sex-atypical and homosexual, it is plausible that homosexual people who are high in self-monitoring may reduce their sex-atypical behaviors more in situations where homosexuality is not accepted. Future research should investigate the relationship between self-monitoring and the concealment of sexual orientation.

Further research should also address the social relevance of concealing one's sexual orientation. Among those homosexual individuals whose orientation is identifiable, those who are less able, or less willing, to conceal may suffer negative social and psychological consequences. Consistent with this idea, previous research suggests that more sex-atypical homosexual men suffer from more psychological distress, perhaps because of prejudice against sex atypicality and homosexuality (Skidmore, Linsenmeier, & Bailey, 2006). However, other research suggests that homosexual people who conceal their sexual orientation have worse physical health outcomes; concealment might physically stress the body, reducing its ability to fight disease (Cole, Kemeny, Taylor, & Visscher, 1996a, 1996b). These studies focused, however, on concealment of self-identity as homosexual, rather than on concealment of nonverbal cues to sexual orientation. Future studies should address both positive and negative correlates of the ability to conceal sex-atypical behaviors as well as causes and consequences of differences in the motivation to do so.

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