

Disparity between implicit work-relevant associations and real-world cognitions

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Abstract

In many parts of the world, including Australia, there is still significant disparity in the wages of women, and gay men and women, compared to heterosexual men. Based on previous research, the conceptualisation of professionalism and professional success is consistent with stereotypically masculine attributes (e.g., dominance), which seems to play an important role in maintaining a range of gender and sexual orientation-based workplace inequality, creating barriers to workplace success for women and gay men. This socially important issue motivates the current study which explored explicit and implicit gender and sexual orientation-based attitudes and work-related associations (e.g., skill) in relation to wage gap estimates. Participants were 116 members of the general public (50.9% women), recruited by undergraduate student researchers. Low levels of explicit sexism and antigay attitudes were found. A complex pattern of differences were found in the estimated salaries for heterosexual men and women, and gay men for the same roles. Implicit associations revealed the typical implicit positivity to women, as well as strong implicit negativity towards gay male targets. The implications of these findings as a basis for workplace inequality are discussed.

Keywords: *gender, sexual orientation, bias, wage gap, implicit cognition.*

Introduction

Women have historically received lower rates of pay than men. In Australia, a basic rate of pay for women of 54% of the minimum wage for men was established in 1919 based on the reasoning that a woman would be working to support only herself, while a man would be supporting himself and his family (Kidd & Shannon, 1996). This is largely inconsistent with contemporary Australian values which admit a commitment to gender equality in the workplace and beyond as demonstrated by the introduction of the Sex Discrimination Act (Commonwealth Government of Australia, 1984). However, a substantial gender wage gap (GWG)

still exists (Workplace Gender Equality Agency [WGEA], 2013).

The official GWG in Australia, calculated as the average difference of all women's and men's full-time weekly earnings (Australian Bureau of Statistics, 2012), has remained stable for more than two decades with women earning between 15% and 20% less than men (WGEA, 2013). This figure is a very simple estimate of workplace gender inequality, omitting more complex issues of non-wage earnings (e.g., overtime, salary sacrifice, and other financial benefits) and workplace opportunities. It is therefore very likely that the difference in men's and women's earning is far greater than this estimate suggests. For example, examination of Australian working arrangements revealed that men were approximately 20% to 30% more likely to be employed full-time, men who worked full-time were paid for approximately four hours more per week than women who worked full-time, and men were 8% more likely to undertake and be financially remunerated for overtime (Australian Bureau of Statistics [ABS], 2012; 2013). Taken together these factors contributed to an average difference of 9 paid hours of work per week and a difference in the median weekly earnings of men and women of 29% (ABS, 2013).

Unequal pay is not the only inequity faced by women in the workforce. For example, a national telephone survey revealed that one in four of women surveyed reported having experienced one or more incidences of sexual harassment in the workplace with women nearly four times more likely to be affected than men (Australian Human Rights Commission [AHRC], 2012). Women also have fewer opportunities for professional advancement compared to men. For example, while women comprised 60% of university graduates and 53% of professionals, women comprise only 10% of executive managers, 3.5% of CEOs and 15% of board directors of ASX200 companies (Sanders, Zehner, Fagg, & Hellicar, 2013). Fox (2013) argues that within the Australian context these figures reflect several issues. First, women are disadvantaged by purportedly meritocratic hiring and promotion procedures due to periods of absence from the workforce (e.g., maternity leave, child rearing). Second, there is a common perception that the gender wage gap is a statistical

misrepresentation (i.e., few women are affected, and even fewer are affected in any substantial way). Finally, the business sector has frequently opted to allow time, rather than intervention, (e.g., quotas) to address the male majority at higher professional levels.

Whelan (2013) identified another important barrier to women in stereotypically male fields, occupations, and roles (e.g., mining, engineering, and management, respectively). That is, there is a pervasive tendency to equate stereotypically male attributes (e.g., dominance) with professionalism resulting in the perception that masculine traits are the essential to success. This means women are professionally overlooked and undervalued, especially for senior position because of the tendency to “think manager-think male” (Schein, 2001, p.675), or even “think leader, think male” (Jackson, Engstrom, & Emmers-Sommer, 2007, p.57). This is consistent with Eagly and Karau’s (2002) conclusion that there is a perceived incongruity between the role of leadership and the attribute of “womanness”. Unfortunately, women who demonstrate typically masculine attributes then face the backlash effect, in which women who do not demonstrate stereotypically feminine attributes are socially and professionally penalised (e.g., niceness; Rudman & Glick, 2001). For example, Pitterman (2013) describes a study that asked student participants to appraise the Curriculum Vitae (CV) of an entrepreneur. The CV was either for *Heidi* Roizen or *Howard* Roizen - the only difference was between the first names. The student ratings indicated that Heidi and Howard were perceived as equally competent and effective, however, the appraised Heidi only as dislikeable and indicated that they would not hire her, or choose to work with her. Taken together, these effects create a no-win situation for professional women and provide an account of findings that women who are appointed to a leadership role are typically evaluated less favourably than their male counterparts (Eagly & Karau, 2002). In sum, “male” is synonymous with professionalism and professional success and, consequently, by virtue of being female, women face significant obstacles in the workplace.

In addition to the substantial explicit biases (e.g., self-reported endorsement of beliefs that women have less leadership potential than men; Eagly & Karau, 2002), researchers have explored the role of implicit biases in workplace gender inequality. Implicit biases are the biased representations stored in memory that are inaccessible and largely unaffected by intentional processes (e.g., Gawronski & Bodenhausen, 2006; Greenwald, McGhee, & Schwarz, 1998). For example, an implicit gender bias may be that women are more implicitly associated with the concepts “home”, “warmth”, and “gentleness” than

with the concepts “work”, “competence”, and “power”¹. Finally, it is important to note that implicit biases are not chosen; rather they are acquired by exposure to information (e.g., gender stereotypes, examples, norms etc.) allowing concepts to become associated with people, objects, and attributes (e.g., Gawronski & Bodenhausen, 2006).

Implicit gender biases are assessed as the speed or accuracy with which people can pair concepts (e.g., “work”, “leadership”) with men and women. For example, the Go/No go Association Task (Nosek & Banaji, 2001) is a speeded computer-based classification task which asks participants to press a key when they see, for example, a man’s face or a word related to the category “work” (e.g., “office”, “occupation”). To make the task difficult, pictures of women and words that are unrelated to the category “work” (e.g., “house”, “holiday”) are also presented, and all stimuli are presented for up to 700ms before the next stimulus is presented. As a result participants have to correctly respond to targets very quickly which is relatively easy when the concepts are strongly implicitly associated, but much harder when targets are implicitly perceived as unrelated or antithetical (e.g., Greenwald, Nosek & Sriram, 2005).

Research using implicit measures has found significantly stronger implicit associations between men and work-relevant concepts such as authority and agency (Rudman & Kilianski, 2000), leadership (Dasgupta & Asgari, 2004), and even occupational roles (e.g., engineer, accountant) compared to women (White & White, 2006). Williams, Paluck, and Spencer-Rogers (2010) found that implicit associations between men-wealth and women-poor, was significantly related to the salary estimates for men and women. They interpreted this finding as evidence that the implicit male-wealth stereotype predicts estimates of the gender wage gap. Taken together, these findings suggest that the tendency to think male-think leader/manager may actually be “think male-think professional” and may be grounded in highly stable, long-acquired, intention resistant cognitions (e.g., Gawronski & Bodenhausen, 2006).

A significant concern of the implicit gender bias research is the consistent finding that women are not only victims of bias, but often perpetrators as well. For example, Rudman and Phelan (2010) found that following exposure to a stereotypical prime (e.g., “male pilot”, “female hairstylist”) compared to the counter-stereotypical prime (e.g., “female pilot”, “male hairstylist”), women demonstrated significantly stronger implicit stereotypes (e.g., men-power and women-warmth >

¹ I note that these attributes are not inherently more or less valuable, only that they are differentially valued in the professional domain and can be considered biased in this context.

men-warmth and women-power) and lower interest in typically masculine jobs (e.g., engineer). Moreover, following exposure to a stereotypical prime, implicit gender stereotype predicted reduced interest in higher status jobs. That is, women became who thought about stereotypical gender-occupation pairs demonstrated more stereotypic views and job preferences. These factors may combine to limit women's interest in high paying roles as well as affecting their perception of their own performance (Boldry, Wood, & Kashy, 2001), limiting their willingness to pursue advancement and remuneration. Added to the negative consequences for demonstrating "professional" attributes (e.g., ambition has been equated with "scheming" for women, but excellence for men; Pitterman, 2013), the fewer opportunities (see the glass ceiling effect; e.g., Wirth, 2001), and the substantial obstacles, these circumstances create and maintain gender workplace inequality.

Gay men, like women, face substantial inequality and discrimination in the workplace (Powdthavee & Wooden, 2014; Ragins, 2004), including the tendency to earn significantly less than heterosexual men (i.e., gay wage gap; Allegretto & Arthur, 2001; Heineck, 2009; Plug & Berkhout, 2008). Research has found that gay men earn up to 27%, less than heterosexual men, (e.g., partnered, tertiary qualified, age matched etc.; Badgett, 1996). Substantially smaller gay wage gaps are typically found for lesbian participants, with some studies finding lesbians earn the same or up to 30% more than heterosexual women (i.e., commensurate with wages of heterosexual men; e.g., Antecol, Jong, & Steinberger, 2008). This has been described as the "lesbian wage premium" (Daneshvary, Waddoups, & Wimmer, 2008, p.29), and has been attributed to factor such as being less likely take leave for child-bearing or rearing (e.g., Bauble, 2009). The remaining difference may reflect findings that gay men and lesbians tend to be more highly educated; are more likely to work in metropolitan locations; to work in health, social, and community sectors; and are more likely to work for large organisations (Arabsheibani, Marin, & Wadsworth, 2005). Arabsheibani and colleagues (2005) speculate that this occurs because gay men and lesbians may self-select "into more tolerant occupations and industries" (p.339). However, such choices may also exclude highly lucrative professions and roles. To date, these issues have not been disentangled.

More general evidence for sexual orientation-based discrimination can be observed in hiring differences for heterosexual and gay job applicants. For example, Tilcsik (2011) conducted a study comparing the interview invitation rate for hypothetical heterosexual and gay applicants based on a CV. Sexual orientation was implied by the applicant having held the position of treasurer for

their college Progressive and Socialist Alliance or Gay and Lesbian Alliance. Findings revealed that heterosexual applicants had an 11.5% interview invitation rate, while gay applications had a significantly lower rate of 7.2%. Tilcsik argues that these findings suggest this is a significant sexual orientation-based discrimination which serves to impede gay applicants' access to employment and maintain sexual orientation-based inequality in the workplace. In contrast, a recent study by Bailey, Wallace, and Wright (2013) using internet-based applications failed to find any evidence of sexual-orientation based discrimination in potential employer responses to a CV. Hiring is, however, only one aspect of professional life which may be affected by sexual orientation-based inequality.

Research exploring the effect of sexual identity disclosure on workplace experiences has revealed evidence that, while openly gay employees felt more supported by their superiors, and experienced less conflict between work and home than gay employees who had not disclosed their sexual orientation to their employer (Day & Schoenrade, 1997), being "out" was significantly related to lower levels of professional support, fewer opportunities, and higher levels of explicit antigay attitudes from others (Trau & Hartel, 2007). Such inconsistent findings are difficult to interpret given their similar methodology, enviably large samples, and similar recruitment strategy (e.g., gay rights organisation and gay volunteer organisations), although the former study was undertaken in the United States, while the latter only included gay men recruited in Australia (Trau & Hartel, 2007). Alternatively, King, Reilly, and Hebl (2008) found that a supportive organisational climate was most predictive of positive experiences of sexual identity self-disclosure for gay men and lesbians, suggesting that these effects may be highly contextual.

Taken at face value, findings from the "coming out" at work literature may indicate that the experience of gay employees has worsened over the decade, or that Australia is a very bad place to be a gay male professional. However, it is also possible that, due to the self-selecting nature of recruitment, respondents were inclined in the 1990s to report on the positive effect of being "out" at work, whereas in the late 2000s, participants were more likely to respond to report dissatisfaction at the progress of workplace equality. Nevertheless, these findings suggest that the decision to "come out" is important and affects a range of outcomes including intentions to leave, organisational commitment, job satisfaction, and career commitment (Ragins & Cornwell, 2001).

Research has also focussed on the experience of workplace prejudice and discrimination experienced by gay and lesbian professionals. For example, Ragins (2004) found that between 25%

and 66% of gay and lesbian professionals report that they have experienced discrimination, and that approximately one third of gay and lesbian professionals experienced verbal or physical harassment. Similarly, 52% of Australian gay and lesbian employees surveyed reported experiences of discrimination in their current role on the basis of their sexual orientation with more than 17% also reporting that they believed their career was limited because of their sexual orientation (AHRC, 2012). More surprisingly, a previous study had found that 10% of gay, lesbian, bisexual, and transgender professionals had been refused employment or denied a promotion on the basis of their sexual orientation and/or gender presentation; in contravention of Australia's anti-discrimination law (Pitts et al., cited AHRC, 2011).

To date, there has been no research examining implicit workplace-sexual orientation biases. The current study was designed to begin to address the identified gap in the literature, and integrate it with existing research on implicit workplace-gender biases. Specifically, the current study was designed to bring together disparate findings from explicit biases, wage gap, and implicit literature, I explore the relationship between explicit and implicit sexism and antigay attitudes, wage estimates as a function of gender and sexual orientation, and implicit work-related cognitions. I propose three sets of hypotheses:

First, based on the findings of Hofmann, Gawronski, Gschwendner, Le, and Schmitt (2005) I predicted that participants would express low levels of explicit sexism and antigay attitudes, consistent with modern egalitarian norms. Based on findings that women tend to express less prejudice, especially antigay attitudes (e.g., Dollinksi, 2010), Is predicted that men participants will report higher levels of prejudice than women participants.

Second, consistent with previous research on implicit biases I predict that implicit attitudes will be positive towards heterosexual women and negative towards heterosexual men when participants complete a gender Go/No go Association Task (GNAT; e.g., Rudman & Goodwin, 2004), but positive towards the same heterosexual men and negative towards gay men when participant complete a sexual orientation GNAT (e.g., Anderson & Kaufmann, 2011; Anderson, Kaufmann, & de la Piedad Garcia, 2015); that there will be stronger implicit associations between heterosexual male and wealth compared to heterosexual female and wealth (Williams et al., 2010) and that heterosexual male will be more strongly associated with wealth than gay male; and lastly, that skill will be more strongly implicitly associated with heterosexual male than with either heterosexual female or with gay male.

Finally, I predict that these general gender- and sexual orientation-based evaluations will not be related to wage estimates, consistent with Williams and colleagues' (2010) findings. However, consistent with the finding of Williams and colleagues, I predict participants will provide lower salary or wage estimates for women and gay men compared to estimates for heterosexual men, and that these estimates will be related to the implicit wealth associations. Taken together, these findings would provide further evidence for the role of specific implicit cognitions (e.g., skill) rather than general implicit attitudes in supporting workplace inequalities.

Method

Participants

Participants were 116 people recruited by undergraduate psychology students from the Melbourne campus of the Australian Catholic University as part of a course on organisational psychology. Each student recruiter recruited at least two non-student participants who were aged 18 years or older. The sample comprised 57 (49.1%) men and 59 (50.9%) women ($M_{age} = 33.16$, $SD_{age} = 15.09$). Due to concerns about the quality of online data collection (e.g., Aust, Diedenhofen, Ullrich, & Musch, 2013), data was closely examined. As a result, from the 225 participants recruited, responses from 109 (48.4%) participants were excluded from analyses including 34 (15.1%) participants who did not complete two or more measures, 55 (24.4%) participants provided non-contingent responses on the wages measure, and 20 (8.9%) participants demonstrated below chance performance on the implicit measure. Student recruiters received 3% course credit in an organisational psychology unit in exchange for completing the recruitment.

Materials

Explicit measures. Explicit attitudes to women and gay men were assessed by the abbreviated sexism and antigay attitudes subscales of the Intolerant Schema Measure (Aosved, Long, & Voller, 2009). The sexism subscale comprises nine items, four from the Neosexism Scale (Tougas, Brown, Beaton, & Joly, 1995) and five from the Attitudes towards Women Scale (Spence, Helmreich, & Stapp, 1973). Participants respond to each statement (e.g., "Women should worry less about their rights and more about becoming good wives and mothers") on a 4-point scale from 0 (*strongly disagree*) to 3 (*strongly agree*). Higher scores indicate higher levels of sexism. The subscale demonstrated excellent reliability ($\alpha = .93$). The antigay attitudes subscale comprises five items

from the Modern Homophobia Scale² (e.g., “I welcome new friends who are gay”; Raja & Stokes, 1998) to which participants respond on a scale 0 (*strongly disagree*) to 3 (*strongly agree*). Higher scores indicate higher levels of antigay attitudes. This subscale also demonstrated very good reliability ($\alpha=.86$).

Gender- and sexual orientation-based wage gaps were measured by 24 statements, with eight describing a heterosexual man, a heterosexual woman, or a gay man in a professional role (e.g., “Jennifer is heterosexual and a surgeon”, “Andrew is gay and a lifeguard”; Williams et al., 2010). Participants then estimated each person/role salary on a scale from \$27,000 to \$175,000 per annum based on the actual average wage range (<http://www.payscale.com/research/AU/>). Three sets of the wage estimates were produced (See Table 1) to permit yoked comparisons of wage estimates for heterosexual men, women, and gay men for the same roles (e.g., version 1 - James is heterosexual and a surgeon; version 2 - Jennifer is heterosexual and a surgeon; version 3 - James is gay and a surgeon). Sets included equal numbers of heterosexual male, heterosexual female, and gay male targets across a range of salaries and occupation types. This approach was adopted to reduce the potential to base their estimates on the target (e.g., women) or wage range, rather than the role. Participants only completed one version comprising all 24 professions which were presented one profession at a time in a random order.

Implicit measures. Three 4-block person-based GNATs (Anderson et al., 2015; Nosek & Banaji, 2001) assessed implicit associations between targets heterosexual male and heterosexual female, or heterosexual male and gay male, and the attributes positive and negative, wealthy and poor, skilled and unskilled. All categories and attributes served as targets and as distracters (see Table 2).

Stimuli representing the categories heterosexual male and heterosexual female, and gay male were eight photos of famous heterosexual males (e.g., Matt Damon), heterosexual females (e.g., Sarah Jessica Parker), and gay males (e.g., Carson Kressley) used in previous research (Anderson et al., 2015). Each attribute was represented by eight words, with positive words (e.g., HAPPY) and negative words (e.g., AWFUL) selected on the basis of length and frequency (i.e., positive terms: average length = 5.0, average frequency = 76.0; negative terms: average length = 4.7; average frequency = 93.2; (Francis & Kucera, 1982). Words representing wealth (“SALARY”) and poor (“CHARITY”) were generated for the purpose of

Table 1

Wage Estimate Stimuli Sets (including per annum wages in AUD\$)

Set 1 (<i>M</i> =\$67K)	Set 2 (<i>M</i> =\$63K)	Set 3 (<i>M</i> =\$53K)
Pilot (\$97K)	Carpenter (\$43K)	Farmer (\$49K)
Army Corporal (\$62K)	Truck driver (\$34K)	Police Sergeant (\$85K)
Architect (\$60)	GP/doctor (\$101K)	Receptionist (\$30K)
Bank teller (\$39K)	Nurse (\$46K)	Dietitian (\$55K)
Hairdresser (\$30K)	Teacher (\$60K)	Accountant (\$53K)
Real estate auctioneer (\$45K)	Bartender (\$29K)	Cashier (\$27K)
Butcher (\$30K)	CEO (\$162K)	Chemist (\$55K)
Politician (\$175K)	House cleaner (\$30K)	Lawyer (\$67K)

Notes: Version 1: Set 1 = heterosexual males, Set 2 = heterosexual females, Set 3 = gay males; Version 2: Set 1 = heterosexual females, Set 2 = gay males, Set 3 = heterosexual males; Version 3: Set 1 = gay males, Set 2 = heterosexual males, Set 3 = heterosexual females.

Salaries based in AUD from <http://www.payscale.com/research/AU/>

this research. Finally, the words representing the attributes skilled (e.g., CAPABLE) and unskilled (e.g., AMATEUR) were adapted from previous research (e.g., Williams et al., 2010).

Implicit associations are calculated based on the signal detection theory index d' (see Nosek & Banaji, 2001 for an explanation) as the probit of correctly identified targets (i.e., participants pressed the spacebar key when a target photo or word was presented) minus the probit of incorrectly identified distracters or false alarms (i.e., participants pressed the spacebar key when a distracter photo or word was presented). Higher d' scores indicate stronger implicit associations between the target category and attribute (e.g., WOMEN-GOOD). The GNAT has demonstrated good to excellent reliability for blocks of 80 trials (Williams & Kaufmann, 2012).

Procedure

Student recruiters were trained in the ethics of psychological research including recruitment without coercion before recruiting participants to take part in the online data collection. Student recruiters provided potential participants with an information letter describing the role of the student recruiters, the topic of the study (i.e., the role of implicit associations and wages), and the measures participants would complete. Consenting participants then logged into the online data collection website and provided their gender and

² This scale was called the Modern Homophobia Scale, however, consistent with APA guidelines, the construct being measured is described as antigay attitudes.

Table 2
GNAT Blocks as a Function of Target and Distracter Categories

Concept	Category		Attributes	
	Target	Distracter	Target	Distracter
Attitude	Male	Female [or gay male]	Positive	Negative
	Female [or gay male]	Male	Positive	Negative
	Female [or gay male]	Male	Negative	Positive
	Male	Female [or gay male]	Negative	Positive
Wealth	Male	Female [or gay male]	Wealth	Poor
	Female [or gay male]	Male	Wealth	Poor
	Female [or gay male]	Male	Poor	Wealth
	Male	Female [or gay male]	Poor	Wealth
Skill	Male	Female [or gay male]	Skilled	Unskilled
	Female [or gay male]	Male	Skilled	Unskilled
	Female [or gay male]	Male	Unskilled	Skilled
	Male	Female [or gay male]	Unskilled	Skilled

Note: Participants completed either the 12 implicit gender association blocks, or the 12 implicit sexual orientation association blocks with only the category stimuli differing between these. Unless indicated otherwise, male and female targets were heterosexual.

Table 3
Mean (and SD) for Explicit Measures as a Function of Participant's Gender

	Men participants <i>M</i> (<i>SD</i>)	Women participants <i>M</i> (<i>SD</i>)	All participants <i>M</i> (<i>SD</i>)
Sexism	0.77 (0.48)	0.45 (0.43)	0.61 (0.48)
Antigay attitudes	0.94 (0.49)	0.80 (0.71)	0.87 (0.61)
Wage estimates			
Men	\$62115.75 (\$6416.42)	\$59868.26 (\$6349.99)	\$60972.63 (6454.31)
Women	\$61477.41 (\$6473.97)	\$60768.16 (\$6368.74)	\$61116.67 (6402.58)
Gay men	\$62054.12 (\$6842.87)	\$60532.19 (\$6142.01)	\$61280.03 (6512.43)

age before completing the explicit measures in randomised order. Finally, participants completed either the 12-block implicit gender associations GNAT or the 12-block implicit sexual orientation associations GNAT.

The GNAT was described to participants as a simple classification task which required participants to respond by pressing the SPACEBAR key when a picture or word representing the targets named in the top left and right corners of the screen appeared in the centre of the computer screen. They were told to make no response if the picture or word did not belong to the named targets. Finally, participants were told that the words and pictures would appear only briefly and that they would receive feedback (i.e., a green O for correct responses and a red X for errors). Participation was completed in a single session which took approximately 40 minutes.

Results

Explicit measures

Participants demonstrated low levels of sexism and antigay attitudes (see Table 3).

Correspondingly, no simple bias was seen in wage estimates as a function of participant's gender, or based on the character's gender or sexual orientation.

Explicit gender- and sexual orientation-based attitudes. Independent samples t-tests were used to examine explicit gender- and sexual orientation-based attitudes. Men were found to demonstrate significantly higher level of sexism than women participants $t(78)=0.32, p<.01, 95\% \text{ CI } [0.12, 0.52]$. No significant difference in antigay attitudes was found as a function of participant's gender ($p=.35$). However, explicit gender- and sexual orientation-based attitudes were found to be highly correlated $r(80)=.48, p<.001$.

Wages. To assess whether participants correctly estimated the order of wages for each set from highest to lowest, a mixed design Analysis of Variance (ANOVA) was used as a manipulation check. Specifically, *wage set* (3: version 1-3, see measures for description) was included as a repeated factor, and *target* (3: heterosexual male, heterosexual female, gay male), and *participant gender* (2: men, women) were included as between subjects factors. The predicted significant main

effect of *wage set* was found $F(4,230)=88.54$, $p<.001$, $\eta_p^2=.44$. No other significant effects were found. The predicted ordering of wage estimates was found (e.g., the highest estimate was given for wage set 1 and the lowest estimate was given for wage set 3) and pairwise comparisons revealed estimates for each wage set significantly differed (all $M_{set1}=63874.63$ $SD_{set1}=6039.86$, $M_{set2}=60711.67$ $SD_{set2}=6271.98$, $M_{set3}=58783.04$ $SD_{set3}=5996.84$; $p_s<.001$).

A mixed design ANOVA was used to compare the wage estimates for heterosexual male, heterosexual female, and gay male targets. Specifically *target* (3: heterosexual male, heterosexual female, gay male) was included as a repeated measures factor and *wage set* (3: version 1-3) and *participant gender* (2: men, women) were included as between subjects factors. No significant main effects were found, however, a significant interaction between target and *wage set* was found $F(4,220)=43.43$, $p<.001$, $\eta_p^2=.44$.

Inspection of the significant interaction between *target* and *wage set* revealed no significant differences however, as can be seen in Figure 1 the ordering of salaries from largest (set 1) to smallest (set 3) was affected by the target.

Implicit measures

Participants who completed the gender GNATs demonstrated stronger (i.e., all d' scores >1) and substantially less variable performance than those who completed the sexual orientation GNAT. Interestingly, the pattern of results for male targets varied as a function of the comparison category (see Table 4). Specifically, while heterosexual male targets were more strongly associated with negative compared to positive attributes when the distracters were heterosexual females, they were more strongly associated with positive compared to negative attributes in the presence of gay male distracters.

Table 4
Mean (and SD) d' Scores for GNAT Blocks as a Function of Target and Attribute

	Gender GNAT ($n=57$)		Sexual orientation GNAT ($n=59$)	
	Heterosexual male targets	Heterosexual female targets	Heterosexual male targets	Gay male targets
	M (SE)	M (SE)	M (SE)	M (SE)
Good	1.91 (1.15)	2.33 (1.14)	1.45 (1.40)	1.24 (1.09)
Bad	2.22 (1.18)	1.96 (1.18)	0.98 (1.08)	1.36 (1.20)
Wealthy	1.22 (0.98)	1.86 (1.06)	0.86 (0.90)	0.91 (0.88)
Poor	1.78 (0.92)	1.54 (0.99)	0.79 (0.87)	1.16 (0.90)
Skilled	1.70 (0.98)	1.82 (1.05)	1.25 (1.09)	1.02 (0.98)
Unskilled	1.80 (1.27)	1.80 (1.27)	0.87 (1.06)	1.25 (1.16)

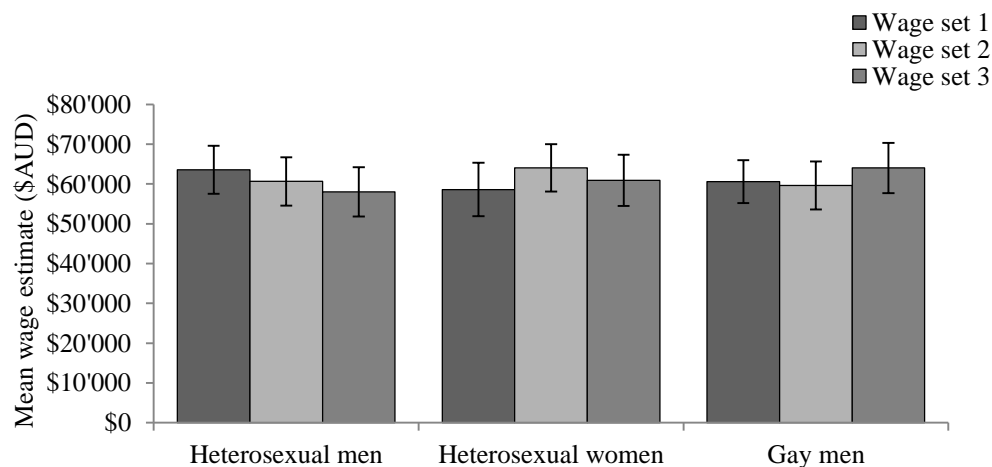


Figure 1. Mean (and SD) estimated wage as a function of stimuli set for heterosexual male and female, and gay male targets.

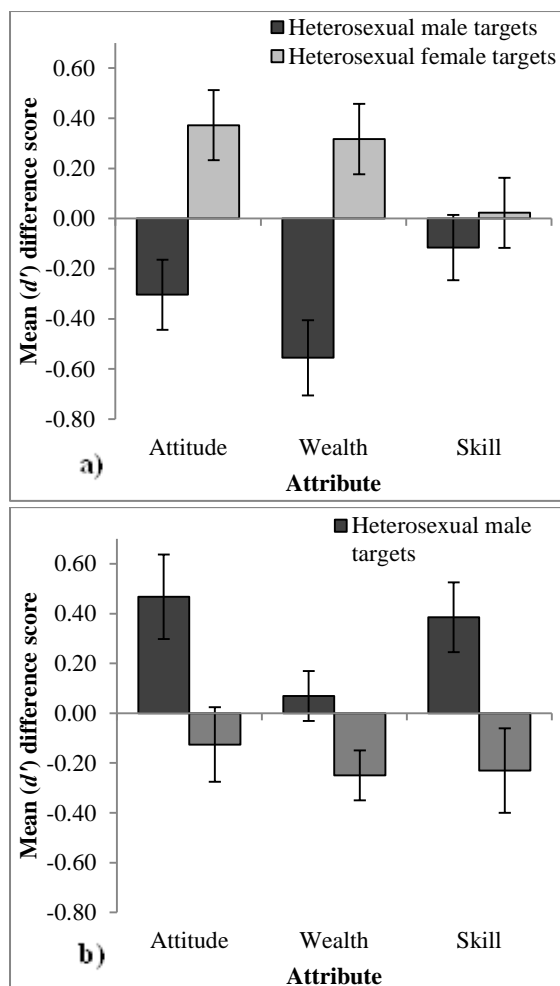


Figure 2. Mean (and SE) difference scores for the gender and sexuality GNATs as a function of target and attribute.

A mixed design ANOVA was used to examine the strength of implicit associations between heterosexual male and heterosexual female targets or heterosexual and gay male targets, and the attributes good and bad, wealthy and poor, and skilled and unskilled. Specifically, the *target* (2: heterosexual male and heterosexual female, or heterosexual male and gay male), *attribute* (3: attitude, wealth, skill), and *valence* (2: positive, negative) were entered as repeated factors, and the *comparison condition* (2: gender, sexual orientation) and *participant gender* (2: men, women) were included as between subjects factors. As a violation of the assumption of equality of covariance (Box's $M=162.65$, $p=.001$) was found, Wilks' Lambda multivariate parameter was interpreted. Analyses revealed main effects of *target* $F(1,112)=11.23$, $p=.001$, $\eta_p^2=.09$, *attribute* $F(2,111)=29.77$, $p<.001$, $\eta_p^2=.35$, and *comparison condition* $F(1,112)=23.30$, $p<.001$, $\eta_p^2=.17$ were found. These effects were complicated by higher order interactions *target*, *valence*, and *participant gender* $F(1,112)=5.42$, $p=.02$, $\eta_p^2=.05$, and *target*,

attribute, *valence*, and *comparison condition* $F(1,112)=23.36$, $p<.001$, $\eta_p^2=.30$.

To examine the complex four-way interaction, separate analyses were undertaken for each condition (gender versus sexual orientation), on difference scores that were calculated by subtracting negatively valenced attribute d' scores from positive valenced attribute d' scores (i.e., GOOD-BAD, WEALTH-POOR, SKILLED-UNSKILLED). Note, positive difference scores indicate stronger positive than negative implicit associations. Difference scores were then analysed by two fully repeated measures ANOVAs exploring differences in implicit associations between heterosexual male and heterosexual female, or heterosexual male and gay male (*target*) and valence, wealth, and skill (i.e., *attribute*).

Results for heterosexual male and heterosexual female targets revealed a significant main effect of *target* $F(1,56)=19.33$, $p<.001$, $\eta_p^2=.26$ which was complicated by an interaction with *attribute* $F(1,56)=8.23$, $p=.01$, $\eta_p^2=.08$ (see Figure 2a). Heterosexual female targets were more strongly implicitly associated with good $t(56)=3.08$, $p=.003$, and with wealth $t(56)=4.20$, $p<.001$ than were heterosexual male targets. No significant difference was found for implicit associations with skill. Results for heterosexual male and gay male targets revealed only a significant main effect of *target* $F(1,58)=27.79$, $p<.001$, $\eta_p^2=.32$ with heterosexual males being significantly more strongly associated with all positive attributes than gay males (see Figure 2b).

Explicit-implicit correlations

No significant correlations were found between explicit and implicit measures (all $ps<.15$).

Discussion

Consistent with predictions, participants demonstrated low levels of explicit sexism and antigay attitudes, and men participants expressed significantly higher levels of sexism, but not antigay attitudes than women participants. The findings for wage estimates were only partially consistent with predictions. Specifically, the significant main effect of wage set demonstrated that participants accurately reproduced the order of average salaries (e.g., wage set 1 > wage set 2 > wage set 3), but that this was affected by significant interaction the character (i.e., gender and sexual orientation manipulation). Interestingly, the significant interaction resulted in higher wage estimates for heterosexual men in wage set 1 roles (e.g., the highest wage set), for heterosexual women in wage set 2 roles (e.g., the mid wage set), and for gay men in wage set 3 roles (e.g., the lowest wage set). The interpretation of this unexpected finding is unclear and may reflect the issue of industry- or role-congruent benefits. For

example, sets containing gender or sexual orientation stereotypical occupations (e.g., Cejka & Eagly, 1999) or may have yielded higher wage estimates, however, there is speculative and would require further investigation.

No significant relationship between implicit and explicit measures was inconsistent with the prediction that lower wage estimates for women and gay men characters compared to estimates for heterosexual characters would be related to the implicit wealth associations based on the finding of Williams and colleagues (2010). However, the lack of relationship between implicit and explicit measures is consistent with the substantial literature that there is commonly little relationship between these types of measures (e.g., Hofmann et al., 2005).

Finally, predictions that implicit attitudes would be positive towards heterosexual women and negative towards heterosexual men when participants complete a gender GNAT, but positive towards the same heterosexual men and negative towards gay men when participant complete a sexual orientation GNAT were supported, consistent with the findings of Anderson and colleagues (2011; 2015). Support was also found for the prediction that there would be stronger implicit associations between heterosexual female and wealth compared to heterosexual male and wealth (Williams et al., 2010) and heterosexual male and wealth compared to gay male and wealth. These findings are consistent with the implicit attitudes findings and bear no real relationship with real world evidence (e.g., wages, status, ABS, 2013) suggesting that this implicit association may actually be another measure of implicit attitudes (e.g., heterosexual women=positive, gay men=negative). In contrast, heterosexual targets were equally implicitly associated with skill and unskilled, while gay men were implicitly associated with unskilled compared to heterosexual men who were implicitly associated with skill.

It is important to note that the wholly inconsistent implicit associations for heterosexual male targets provide further evidence of the importance of contextual variation (e.g., Mitchell, Nosek, & Banaji, 2003). That is, the exact same targets were implicitly associated with negative (and poor) when distracters were women, but implicitly associated with positive (and wealth) when the distracters were gay men. This suggests that these implicit associations include more than a simple relationship between the target (e.g., men) and the attribute (e.g., valence, wealth, skill). In life, this variability permits variously positive perceptions of a target, leading to different outcomes as a function of available comparisons.

A limitation of the current study was the rather simplistic approach used in adapting Williams' et al., (2010) wages measure to incorporate wage

estimates for gay men. Specifically, the only major consideration was the development of sets of similar means wages. Future research should consider factors such as human capital (e.g., education) and industry which have been found to be differentially associated with each gender and sexual orientation (e.g., Antecol et al., 2008). In doing so, it would be possible to explore the potential contribution of workplace knowledge (e.g., actual wages) and the potential rewards or penalties appointed to people who engage in atypical or counter-stereotypical occupations.

It is also a limitation of this research that lesbians were omitted as a target of this research. This decision was made due to the very limited research on which to base predictions, and the already substantial scope of the current research. However, it is clear that in addition to the research that is needed to further explore the implicit workplace associations with heterosexual women and gay men, there is a pressing need for research to explore these issues in relation to lesbians.

The current study provides the first empirical comparison of the factors underpinning workplace disadvantage faced by heterosexual women and gay men, and is also the first to explore work-relevant implicit associations with gay men. As such, I draw attention to the two most interesting findings. First, the finding that heterosexual male targets were implicitly associated with positive attributes, with wealth, and with skill when distracters were gay men, and the findings that heterosexual female targets were implicitly associated with positive and wealth, but not skill when distracters were heterosexual men. The first of these findings is consistent with implicit anti-gay attitudes measured using a person-based approach (see Anderson et al., 2015) suggesting that gay male targets were the subject of implicitly prejudiced general (e.g., positive) and specific or work-related (e.g., skill) cognitions compared to heterosexual male targets. The second finding could be interpreted similarly for heterosexual men; however it seems likely that such an interpretation would be flawed. Rather, this finding seems to suggest implicit benevolent sexism towards women. Specifically, women are implicitly benefited from associations with attributes that are potentially of little consequence in the workplace (Baretto & Ellemers, 2005; Glick & Fiske, 2001).

This research has brought together the disparate topics of gender workplace inequality, sexual orientation-based workplace inequality, and implicit social cognition. It provided some preliminary answers to simple questions, and provided some suggestions for future research. Most importantly, the findings of this research suggest the potential important role played by implicit cognitions in maintain workplace inequality.

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