


# Sexual orientation–based wage gaps in Australia: The potential role of discrimination and personality

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## Abstract

This article reports a research finding that lesbians in Australia earn an unexplained wage premium of 0%–13%, whereas gay men experience an unexplained negative wage gap of 8%–18%. Based on data from the Australian household panel Household Income and Labour Dynamics in Australia, the article is the first to establish these gaps in Australia, and to examine the degree to which credence can be afforded to claims that endowments such as personality traits may help explain such wage differentials. Using ordinary least squares and Blinder–Oaxaca decomposition methods, the study explicitly includes the battery of Big Five personality traits in wage regressions and estimates the contribution of endowments and returns to these traits. The finding is that personality traits and returns to them do not differ along lines of sexual orientation. Gay men in particular suffer a substantial unexplained wage penalty in the workplace. Such unexplained differences suggest that discrimination on the basis of sexual orientation, though unlawful, may exist in Australia.

**JEL Codes:** J15, J71

## Keywords

Discrimination, personality, sexual orientation, wage decomposition, wage determination, wage gaps

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## Introduction

Do homosexual workers in Australia suffer wage gaps that cannot be explained by their observable characteristics? To what extent do these gaps reflect differences in personality? This article attempts to answer these two questions, and in so doing, to provide evidence for or against the notion that homosexual workers suffer from wage discrimination. Wage discrimination exists when two otherwise identical workers are paid different wages because of a characteristic such as gender, race or sexual orientation (Becker, 1971). In Australia, discrimination of this form is illegal and rights are protected under state and federal law. While the persistent gender pay gap has been well studied, stronger concern for and recognition of gay and lesbian rights has resulted in a new focus on labour market discrimination on the basis of sexual preference. Raw and unexplained gaps in wages between homosexual and heterosexual workers have been identified across the developed world (Badgett, 2006). These gaps are generally negative for gay men and positive or zero for lesbians. In this article, I make two contributions to the study of wage gaps that might be attributed to sexual orientation. First, I establish whether raw and unexplained wage gaps of this kind exist in Australia. Second, I explore whether stereotypical differences in personality characteristics exist that might explain or reduce the estimated gap.

A small but growing body of literature has sought to identify whether gaps in wages along lines of sexual orientation are the result of observable differences in worker characteristics. Gaps that are not explained by differences in observable characteristics are often interpreted as discrimination. In the United States, these estimates range from  $-2\%$  to  $-27\%$  for gay men, and from  $0\%$  to  $40\%$  for lesbians (Allegretto and Arthur, 2001; Antecol et al., 2007; Badgett, 1995; Berg and Lien, 2002; Black et al., 2003; Elmslie and Tebaldi, 2007; Klawitter and Flatt, 1998). In Sweden, Ahmed and Hammarstedt (2010) found unexplained wage gaps of up to  $-15\%$  for gay men but no significant gap for lesbians. Other studies include Carpenter (2008) in Canada, Ahmed and Hammarstedt (2010), Plug and Berkhout (2004, 2008) in the Netherlands, and Arabsheibani et al. (2005) in the United Kingdom. These studies broadly confirm the pattern of negative differentials for gay men and positive differentials for lesbians.

Taken together, these studies indicate that the wage penalty for gay men is robust and persistent over time but suggest greater uncertainty regarding the pay differential for lesbians. At this point, only one study has investigated whether the gap (for gay men) is declining over time. Clarke and Sevak (2013) find that the gay male penalty in the United States has declined, becoming a wage premium by the early 2000s. No study to date has identified whether a sexual orientation-based wage gap exists in Australia. My focus here is on establishing the average gap over the period 2001–2010 in Australia. Although we may expect gaps to be similar to those identified for the United States and for European countries, the variation in the magnitude of the estimated effects across countries and across time suggests that an Australian study is warranted.

Any explanation for the sexual orientation wage gap that does not imply discrimination must account for the asymmetric pattern of these gaps by gender. Here, my focus is on the role that personality characteristics of workers might play in determining wages, and in particular what role they might play in explaining wage differences along lines of sexual orientation. Thus far, this explanation has not been explored in the literature.

Recent trends in the wage literature suggest that personality is an important non-cognitive skill or behavioural trait (Bowles et al., 2001) and personality has been shown to have important impacts on labour market outcomes including wages (see, for example, Nyhus and Pons (2005) and Cobb-Clark and Schurer (2012)). Including personality as a productivity-related characteristic has been shown to reduce the estimate of the gender pay gap (Mueller and Plug, 2006; Nyhus and Pons, 2012). In their study of Dutch employees, for example, Nyhus and Pons (2012) find that endowments of personality traits differ across men and women, and that these differences explain up to 11.5% of the gap in wages. They thus find that to some extent women are paid less in the workplace because of their personality types, and not because the returns to women are lower (i.e. they find less evidence for discrimination). It is therefore feasible that differences in endowments of personality, rather than differences in the returns to the same personality types, may cause differences in wages along lines of sexual orientation.

Psychologists have established that people commonly hold beliefs about how the personality traits of gay men and lesbians differ from those of heterosexual men and women (Kite and Deaux, 1987; Madon, 1997). One such stereotype is that gay men are less aggressive and more emotional than heterosexual men, and that gay women are more aggressive than heterosexual women. Stereotypical beliefs of this nature have been found both historically and in contemporary society (see, for example, Blashill and Powlishta (2009) and Madon (1997)). This literature suggests that controlling for personality may therefore explain the differences in wages along lines of sexual orientation (Badgett, 2006). However, no previous study has had access to information on the personality traits of individuals in their sample. My sample pools data from the Household Income and Labour Dynamics in Australia (HILDA) survey covering the years 2001–2010.<sup>1</sup> This detailed dataset provides a rich set of covariates for individuals and their households. The HILDA survey allows for the identification of sexual orientation of coupled respondents alongside personality traits.

To identify the impacts of personality on wages, I use the ‘Big Five’ classification of personality traits as covariates in a wage regression. The Big Five is a classification of personality types based on five traits: Extroversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to Experience. In contrast to stereotypes of gay men and women, I find that within gender groups, personality traits are on average consistent across sexual orientation. Moreover, I find that although wages are affected by personality traits, this effect is the same for heterosexual and homosexual workers. Not only does this refute the stereotypes of personality, but it also suggests that wage gaps cannot simply be attributed to differences in personality that are valued in the workplace. Including personality traits in the wage equation does not lead to a reduction in the unexplained gap. With and without personality traits, homosexual men experience a penalty of 11%–13%, while heterosexual women also receive a penalty of 11%. In further robustness checks, this gap expands to a range of 8%–18% penalty for gay men and 0%–13% for heterosexual women. The range of these results is within that of previous studies despite the fact that such studies have not been able to control for personality. This suggests that these previous estimates may in fact be robust to differences in personality.

The remainder of the article is structured as follows. The next section describes theoretical and empirical models of wage determination and discusses empirical strategies to identify wage gaps. The data and estimation strategy are then outlined before the results are presented. The results are discussed in the following section before concluding remarks are made.

## Models of wage discrimination

### *Theoretical frameworks*

A number of theories attempt to explain differences in wages along lines of gender, or sexual orientation, without relying on an explanation of discrimination. In part, the purpose of these models is to clarify whether differences in wages could be due to non-discriminatory processes and thus to what extent we can interpret wage gap estimates as evidence of discrimination. To adequately explain wage differentials along lines of sexual orientation, such theoretical models must generate predictions of the wage gap that differ by gender. One approach starts with the recognition that the household is the decision-making unit; members of a household can specialise in the production of home or market goods (Becker, 1981). In heterosexual couples, women are often assumed to have a comparative advantage in home production. The observed 'marriage premium' for heterosexual males (i.e. higher wages that cannot be explained by observable characteristics) could reflect the unobserved acquisition of human capital for market production. This, however, is not established empirically. Still, explanations along these lines could explain the higher wages received by lesbians. Black et al. (2003) argue that lesbians may anticipate a greater need to specialise in market production, leading to an expected wage premium over their heterosexual counterparts. They suggest that in contrast, relative to heterosexual men, gay males may anticipate less of a need to specialise in market production. If this is the case, then observed wage gaps may be due to unobserved productivity differences rather than discrimination.

A related theory focuses on the role of household income. Berg and Lien (2002) argue that households take gender-based labour market discrimination *as a given* when making specialisation and investment decisions. Given this discrimination, an individual with a male partner (gay men and heterosexual women) has a higher expected household income than one with a female partner (heterosexual men and gay women). Gay men and heterosexual women may therefore choose higher levels of leisure as a substitute for income and/or specialise in home production.

This article sheds further light on how well the income and household specialisation theories account for observed wage gaps in Australia. Another possibility for the existence of unexplained wage gaps – the possibility focused on here – is that unobserved personality characteristics explain differences in wages along lines of sexual preference. To test this, I examine whether personality is correlated with sexual preference and whether this control factor has an impact on estimates of the wage gap. This may be the case if personality traits such as self-control or conscientiousness affect productivity in the workplace (as has been found in the literature). The next section outlines the main empirical models of wage gaps before going on to outline the data and results.

### Empirical frameworks

Making the assumption that the log of wages is a linear function of covariates, the following model can be specified

$$\log(w_i) = \beta X_i + \delta H_i + \varepsilon_i$$

where  $X_i$  is a vector of characteristics and  $H_i$  is an indicator for whether or not individual  $i$  is homosexual (homosexual = 1) (either specified jointly or separately for men and women). The parameter  $\delta$  thus captures the effect of sexual orientation on wages conditional on the characteristics  $X_i$  and as such is the parameter of interest. First, I include a standard set of covariates in the vector  $X_i$  and then add controls for personality to this vector to capture differences in wages due to different personality characteristics. Importantly, this ordinary least squares (OLS) model assumes that the return to productivity characteristics is independent of sexuality. To relax this assumption, the log wages of individual  $i$  in group  $g$  can be modelled separately (again potentially separately for women and men). The wage gap (evaluated at the mean) can be decomposed into the portion of the gap attributable to different observable characteristics (endowments) and the portion of gap attributable to different returns to these characteristics (coefficients) (Blinder, 1973; Oaxaca, 1973). This approach is referred to as the Blinder–Oaxaca decomposition.

The Blinder–Oaxaca model allows returns to differ by group status. The model of wages becomes

$$\log(w_{i,g}) = \beta_g X_{i,g} + \varepsilon_{i,g}$$

where  $g = h, s$  denotes each group. Then the Blinder–Oaxaca model decomposes the log wage gap into

$$\log(W_h) - \log(W_s) = \beta_s(X_h - X_s) + X_h(\beta_h - \beta_s) + (X_h - X_s)(\beta_h - \beta_s)$$

where  $W_h$  is the average wage for homosexual workers,  $W_s$  is the average wage for heterosexual workers, and  $X_h$  and  $X_s$  are the mean characteristics for homosexual and heterosexual workers, respectively. The term  $X_h(\beta_h - \beta_s)$  is the gap attributable to different returns to characteristics and is often interpreted as discrimination. The term  $(X_h - X_s)(\beta_h - \beta_s)$  is an interaction term accounting for the fact that differences in coefficients and endowments occur together. This is the threefold decomposition outlined in Jann (2008).

All empirical models rely on a range of assumptions in order to produce unbiased, consistent and efficient estimates of the parameters of interest. Two particular identification issues are unique to the study of wages and sexual orientation. The first relates to the ability of employers to discriminate. Unlike gender or race, sexual orientation is not a trait that is necessarily visible to employers. Some individuals may then be modelled as if they were being paid as *homosexuals* when in fact they are being paid as *heterosexuals*. Estimates of the unexplained wage gap will then be biased, particularly if disclosure (or

indeed sexual orientation itself) is a function of wages (Badgett, 2006) or if workers have an incentive to hide their homosexuality. In the example outlined above, if workers identified as homosexual do suffer discrimination, then incorrectly modelling a worker as heterosexual would reduce average heterosexual wages and lead to an underestimate of the magnitude of the gap.

Compounding this problem are practical difficulties faced by the researcher seeking to classify respondents according to their sexual orientation based on available data. All studies of wage discrimination in the literature rely on some form of survey data and utilise a range of different methods to identify an individual's sexual orientation. Some studies use a measure based on the ratio of same sex to heterosexual partners an individual has had; some use only self-identification measures; and others use formal registration of same sex relationships. Different measures will result in different estimated effects (Badgett, 2006; Black et al., 2003). Badgett (2006) argues that self-reports of sexual orientation are preferable on the assumption that individuals who self-report are more likely to be 'out' in the workplace. However, there is no formal evidence that tests this hypothesis. My identification relies on the gender of a respondent's partner (as no other measures are available for the HILDA panel I utilise). In this way, I investigate the wage gap for workers in same sex relationships. To test the robustness of the estimates to the identification strategy used, two different methods are used, which are outlined below.

Selection into the labour market, into full-time employment and into occupations may also lead to inaccurate estimation of the wage structure. In order to avoid confounding my results with selection into the labour market, I focus on respondents who are employed. This does not reduce the possibility of selection problems into full-time (vs part-time or casual) employment or occupation. Arulampalam et al. (2007) suggest that controls for industry and occupation may be endogenous. These measures may represent unmeasured human capital but may also be correlated with other unobservable measures of productivity. In the case of gender wage gaps, they suggest that estimates with (without) controls for occupation provide a lower (upper) estimate of discrimination. The same analysis can be readily applied to the estimation of wage gaps by sexual orientation to deal with potential selection into both full-time employment and occupation. Estimates with and without occupation controls are presented and, although the details are not included, the results were also checked for robustness to specifications dropping employment type.

In their survey of decomposition methods, Fortin et al. (2010) suggest that endogeneity bias may not be a significant issue for wage decomposition. They suggest that as long as an assumption of ignorability holds, aggregate decompositions of wage gaps (as per the Blinder–Oaxaca decomposition) yield valid estimates. Ignorability implies that given a set of covariates  $X$ , the unobservables contained in the error  $\varepsilon$  are independent of group membership. Intuitively, this means that the joint densities of observables and unobservables for each group must be 'similar'. Fortin et al. (2010) show that when this assumption replaces the standard identification assumption, the aggregate wage gap can be decomposed into returns to characteristics and distributions of characteristics ( $X$  and  $\varepsilon$ ) and consistently estimated. However, detailed decompositions still require the stronger assumption of independence (and interpretation is limited). They also note that

ignorability is violated if selection on unobservable characteristics differs across groups. I make the assumption that, conditional on observable characteristics, selection on unobservable characteristics does not differ by sexual orientation. To provide context, this assumption would be violated if high-productivity gay men choose different occupations from high-productivity heterosexual men because of the perception of greater homophobia in some industries, and this occupational choice affects their wage rate. To avoid confounding results with selection, several robustness checks were undertaken, as indicated above.

## Data

As noted, the sample for this study comes from pooling observations from the HILDA survey over the years 2001–2010. HILDA is a nation-wide panel dataset of Australian households collecting a wide range of household and individual information. The sample is restricted to employed respondents between the ages of 22 and 60 years.<sup>22</sup> The HILDA survey for waves 1–10 does not ask respondents directly about their sexual orientation. Identification of gay respondents therefore relied on being able to identify same sex couples. A respondent was classified as homosexual if they reported living with a partner of the same sex. The base specification assumes that those not living in a same sex relationship are heterosexual. As a robustness exercise, I then classified someone living in a relationship with a person of the opposite sex as heterosexual, and excluded all individuals not living in a relationship.

If there were discrimination, then it seems reasonable that this base strategy of identifying sexual orientation would tend to yield an underestimate of it. However, the co-habiting couples in my sample may be more likely to be openly identified as homosexual in the workplace. If this is the case and there is discrimination against openly gay workers, then I may overestimate discrimination experienced by the average homosexual worker.

Once the sample is restricted to homosexual and heterosexual couples, the detailed information available in the HILDA survey also allows inclusion of the characteristics of a respondent's partner in the regression. Theories of household specialisation suggest that these covariates may be important in individual decisions to invest in human capital (Becker, 1981; Berg and Lien, 2002; Black et al., 2003).

The additional robustness checks undertaken to address potential weaknesses in how homosexual or heterosexual groups are classified are as follows. First, I create a second sample of homosexual respondents. An *observation* can be classified based on whether they are living with a same sex partner; this is the main identification strategy of the article. Alternatively, a *respondent* can be classified based on whether they have lived with a same sex partner in any wave. Respondents who have participated in more waves of the HILDA survey are more likely to be recorded in HILDA as living with a partner and therefore be identified as gay.

The base sample consists of 4743 men and 4945 women. In the pooled sample used for estimation, 36 men and 56 women were identified as living in a same sex relationship. The sample of identified gay men and women is thus very small relative to that of the heterosexual sample. As a point of reference, just 1% of couples were in a same sex

relationship in the 2011 Census (Australian Bureau of Statistics (ABS), 2013). Indeed, only 28% of people identifying as homosexual reported being in a couple relationship compared to 58% for heterosexual respondents (ABS, 2013). The relative size of the sample used here is thus fairly consistent with the size of the same sex-coupled population. Given the small size of the homosexual sample and the large size of the heterosexual sample, interpretation of the results should also be appropriately qualified. Although HILDA is designed to be a representative panel, the results from this small sample (as from any small sample) may not generalise well to the entire Australian population.

The dependent variable for all estimations is the log of real hourly wages for an individual in his or her main job. The estimations all include controls for age, education, experience, state, job tenure, labour force status (working full time, part time or casual), number of children, occupation tenure, place of birth (Australia or elsewhere), language background (English as first language or not), employed in small-medium enterprise (business with less than 100 employees) and union status. Importantly, the experience variable (measured in years of full-time work experience) is not constructed based on assumed years in the workforce as is standard practice, but is derived directly from detailed work history information collected in HILDA.

In waves 5 and 9 (2005 and 2009), HILDA provides five measures of personality traits known as the 'Big Five'. Appendix 1 provides a detailed description of these personality indices. Cobb-Clark and Schurer (2012) show that the Big Five measures are relatively stable over a 4-year period. Hence, covariates for personality for all years of the HILDA survey can be generated.

Table 1 presents descriptive statistics (means and standard errors) for the sample of employed workers based on gender and sexual orientation. Lesbians have the highest mean wages followed by heterosexual men. Men are more likely to be employed full time than women, and heterosexual workers are more likely to be employed full time than homosexual workers. The gay sample is younger than the heterosexual sample. Lesbians have the highest incidence of postgraduate education, while heterosexual men have the highest tenure in their occupation and their current job. Males are most likely to be employed full time, while heterosexual females are least likely to be employed full time. Heterosexual women have on average 1.4 children, while lesbians have 0.4 and gay men have 0.2. Clearly, heterosexual and homosexual workers differ on observable characteristics.

Table 2 reports descriptive statistics for occupational categories and the Big Five personality scores. Heterosexual women score higher across all Big Five measures. Higher scores indicate greater accord with the personality characteristic. No other discernible pattern across the groups is readily identified. For example, on some measures (Agreeableness), lesbians report levels more similar to those of heterosexual women; on others, they report results similar to men (Openness to experience, Conscientiousness). Occupational differences are also apparent; heterosexual males are most likely to be in a trade, while lesbians most likely to be professionals.

## Empirical analysis

This section presents results of OLS and the Blinder–Oaxaca methods. The sample is restricted to those who are employed. Sample sizes will differ across columns to reflect



**Table 1.** Descriptive statistics by gender and sexuality.

	Male homosexual	Male heterosexual	Female homosexual	Female heterosexual
Log real wages	3.061 (0.367)	3.107 (0.512)	3.197 (0.534)	2.992 (0.468)
Age	38.440 (9.774)	38.001 (11.618)	36.564 (9.612)	38.654 (11.676)
Postgraduate	0.022 (0.147)	0.050 (0.218)	0.114 (0.319)	0.040 (0.195)
Graduate diploma	0.121 (0.328)	0.055 (0.228)	0.141 (0.349)	0.085 (0.279)
Bachelor	0.143 (0.352)	0.152 (0.359)	0.255 (0.437)	0.190 (0.392)
Diploma	0.110 (0.314)	0.087 (0.281)	0.114 (0.319)	0.104 (0.305)
Certificate III	0.231 (0.424)	0.280 (0.449)	0.268 (0.445)	0.150 (0.358)
Certificate I or II	0.033 (0.180)	0.012 (0.111)	0.000 (0.000)	0.014 (0.119)
Other certificate	0.000 (0.000)	0.001 (0.032)	0.000 (0.000)	0.005 (0.071)
Year 12	0.242 (0.431)	0.168 (0.374)	0.074 (0.262)	0.190 (0.392)
Year 11	0.099 (0.300)	0.195 (0.396)	0.034 (0.181)	0.222 (0.415)
Work experience (years)	19.443 (10.698)	19.432 (11.856)	15.824 (8.922)	17.104 (10.632)
Job tenure (years)	5.099 (6.630)	7.057 (8.155)	4.621 (5.761)	5.955 (6.883)
Labour force status (full time)	0.934 (0.250)	0.887 (0.317)	0.705 (0.458)	0.542 (0.498)
No. children	0.242 (0.794)	1.328 (1.340)	0.403 (0.869)	1.414 (1.335)
Occupational tenure (years)	8.739 (8.619)	9.264 (9.554)	5.924 (6.631)	8.245 (8.958)
Birthplace (0 = Australia)	0.308 (0.464)	0.183 (0.387)	0.161 (0.369)	0.187 (0.390)
Language (1 = English first language)	0.923 (0.268)	0.928 (0.258)	0.973 (0.162)	0.915 (0.280)
Works in small to medium enterprise	0.451 (0.500)	0.647 (0.478)	0.570 (0.497)	0.672 (0.470)
Union member	0.297 (0.459)	0.301 (0.459)	0.423 (0.496)	0.280 (0.449)
Observations	91	16,958	149	17,416

Source: HILDA.

HILDA: Household Income and Labour Dynamics in Australia.

Standard deviations in brackets.

definitions of sexual orientation. In addition, when personality and partner characteristics are included, additional observations are dropped due to missing values. The numbers dropped in the latter cases are minimal and not considered important.

Table 3 shows the OLS estimates of the effect of sexual orientation on the log of hourly wages for men and for women. All standard errors are clustered at the individual level to account for correlation between individual observations over time as per Bertrand et al. (2004). Controlling for basic observable characteristics, the effect of being gay is significant and negative for men. Gay men have approximately a 9% lower expected wage. Once occupation is included, the expected hourly wage of a gay man with the same observable characteristics is lower. This intuitively suggests that controlling for occupation increases the gap between the expected wage of a gay male and a heterosexual male,

**Table 2.** Descriptive statistics (personality, occupation) by gender and sexuality.

	Male homosexual	Male heterosexual	Female homosexual	Female heterosexual
Conscientiousness	4.077 (3.259)	4.155 (2.930)	4.054 (2.955)	4.560 (2.788)
Agreeableness	4.286 (3.219)	4.242 (2.918)	4.539 (2.806)	4.890 (2.784)
Emotional stability	3.480 (3.239)	4.254 (2.958)	4.184 (2.716)	4.488 (2.777)
Openness to experience	3.383 (2.986)	3.446 (2.770)	3.372 (2.689)	3.543 (2.585)
Extroversion	3.057 (2.846)	3.469 (2.776)	3.590 (2.616)	3.921 (2.687)
Observations	86	14963	124	15,335
Manager	0.187 (0.392)	0.134 (0.340)	0.121 (0.327)	0.072 (0.258)
Professional	0.440 (0.499)	0.212 (0.409)	0.450 (0.499)	0.292 (0.455)
Trade	0.022 (0.147)	0.219 (0.414)	0.067 (0.251)	0.039 (0.194)
Community worker	0.033 (0.180)	0.071 (0.258)	0.121 (0.327)	0.150 (0.357)
Clerical	0.143 (0.352)	0.087 (0.281)	0.168 (0.375)	0.253 (0.435)
Sales	0.055 (0.229)	0.058 (0.235)	0.047 (0.212)	0.112 (0.315)
Plant and machinery operator	0.055 (0.229)	0.113 (0.316)	0.013 (0.115)	0.010 (0.099)
Labourer	0.066 (0.250)	0.106 (0.307)	0.013 (0.115)	0.072 (0.258)
Observations	91	16,958	149	17,416

Source: HILDA.

HILDA: Household Income and Labour Dynamics in Australia.

Standard deviations in brackets.

and that gay men must on average therefore be employed in higher paid occupations. However, the hypothesis that the coefficients are in fact the same cannot be rejected at any reasonable confidence level. Intuitively, gay men are in general in higher paid occupations; controlling for this, the unexplained gap is higher. Similarly, wage gaps estimated without the labour force status variable (controlling for part-time/full-time/casual employment status) do not affect the interpretation of the results.

Columns 3–4 present estimates when the sample of heterosexuals is restricted to those living in a couple. Again, results with and without occupational controls are presented. Restricting the sample to couples increases the point estimate of the gap. This is consistent with a generally identified ‘marriage premium’ for heterosexual males. Once again, including occupation actually increases the point estimates of the gap but not in a statistically significant way.

By contrast, changing the identification strategy to one in which a respondent is considered as homosexual for all waves of HILDA *does* change the estimate (column 6). The effect of being gay now becomes marginally significant. This coefficient is not statistically different to the baseline (column 1); however, it is statistically different to that obtained for the couples regression (column 4). The estimate could be affected by the identification strategy and/or gay men could experience discrimination when they are easily identifiable as homosexual in the workplace (i.e. when living with a same sex partner).

**Table 3.** Male and female sexuality wage gaps identified using ordinary least squares.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Male log hourly wages</b>							
Sexuality	-0.093* (0.042)	-0.133*** (0.038)	-0.159*** (0.038)	-0.182*** (0.041)	-0.179*** (0.038)	-0.088* (0.039)	-0.136*** (0.033)
N	17,049	17,049	11,669	11,669	11,306	17,049	15,049
R <sup>2</sup>	0.282	0.300	0.225	0.246	0.250	0.300	0.316
F	99.847	88.146	52.599	49.330	38.521	88.082	68.772
<b>Female log hourly wages</b>							
Sexuality	0.130* (0.051)	0.113* (0.050)	0.096 (0.051)	0.086 (0.050)	0.075 (0.050)	0.125** (0.047)	0.128* (0.057)
N	17,565	17,565	11,512	11,512	10,657	17,565	15,459
R <sup>2</sup>	0.232	0.276	0.216	0.261	0.266	0.276	0.289
F	100.887	107.459	68.603	72.320	53.410	107.497	82.955

Clustered standard errors in parentheses.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Sexuality is an indicator variable with 1=homosexual. Sexuality is identified by observation (columns 1-5,7), identified across the sample (column 6). Models are by columns: (1) baseline model (2) with occupation controls (3) coupled respondents only (4) with occupation controls, coupled respondents only (5) with occupation controls, partner characteristics, coupled respondents only (6) with occupation controls (7) with personality controls.

Source: HILDA.

Column 7 presents estimates when controls for personality are included. The point estimate is consistent with the baseline and suggests that personality does not explain the lower hourly wages received by gay men. The estimated coefficients on personality variables suggest that there are lower returns to being agreeable and higher returns to being conscientious. Other personality characteristics have no significant effect on wages. The results are broadly consistent with the literature identifying the effects of personality on wages (though Mueller and Plug (2006) and Nyhus and Pons (2012) find different traits are significant). The results are also robust to the inclusion of covariates for occupation. Finally, the inclusion of partner characteristics (column 5) does very little to change the results. Consistently (but not reported here), the estimates on the coefficients of partner characteristics are largely insignificant, although having a partner in full-time work does reduce expected wages by a statistically significant amount. Coefficients on other explanatory variables for models in columns (1), (3) and (7) are provided in Appendix 2.

The results for the sample restricted to women are reported in the second panel of Table 3. The story revealed by these estimates is distinctly different from that for men. First, the point estimates for all regressions are positive. Second, while the effect of being in a same-sex relationship is marginally significant and positive in the original sample (columns 1–2), the estimates become insignificant once the sample is restricted to women in couples (columns 3–4). This is consistent with the idea of a ‘marriage premium’ for heterosexual women (however, the hypothesis that the coefficients are the same as the baseline cannot be rejected). Although the effect of homosexuality is insignificant when the characteristics of a women’s partner are included, the point estimate for whether or not this partner is employed full time is again negative and significant (not reported).

Including controls for personality (column 7) marginally increases the point estimates, suggesting that the premium received by lesbians is not due to the returns to personality (again, this increase is not significant). As for men, the return to being agreeable is negative and significant, while the return to being conscientious is positive. Overall, wages appear to be less sensitive to personality for females.

When the alternative identification strategy for homosexuality is adopted, the estimates for the effect of homosexuality become (more) significant (column 6). Once occupation is included in the regression, the premium received by lesbians reduces, suggesting that, like gay men, lesbians are in relatively high paying occupations (although the point estimates are not statistically different). Once again, coefficients on other explanatory variables for models in columns (1), (3) and (7) are provided in Appendix 2.

To allow coefficients on observable characteristics to vary in the wage equation, a series of Blinder–Oaxaca decompositions was undertaken. The aggregate decompositions are of primary interest here and are presented in Table 4. The ‘Difference reported’ represents mean log wages of heterosexual men (women) minus mean log wages of homosexual men (women). This can conveniently be interpreted as the percentage difference in wages between heterosexual and homosexual workers. A positive entry for Endowments indicates that the contribution to the difference in mean log wages, evaluated at the coefficients of homosexual men (women), is positive. The interpretation of the entry for Coefficients is similar. A positive entry indicates that the contribution to the gap made by differences in coefficients is positive.

**Table 4.** Blinder–Oaxaca wage decompositions by sexuality for males and females.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Male log hourly wage decompositions							
Heterosexual	3.107***	3.107***	3.208***	3.208***	3.209***	3.107***	3.124***
Homosexual	3.061***	3.061***	3.064***	3.064***	3.064***	3.107***	3.059***
Difference	0.046	0.046	0.144***	0.144***	0.146***	-0.000	0.065*
Endowments	-0.012	-0.012	0.049	-0.010	0.018	-0.109	-0.162
Coefficients	0.093***	0.133***	0.159***	0.183***	0.179***	0.089*	0.136***
Interaction	-0.035	0.008	-0.064	-0.028	-0.051	0.021	0.091
N	17,049	17,049	11,669	11,669	11,306	17,049	15,049
Female log hourly wage decompositions							
Heterosexual	2.992***	2.992***	3.041***	3.041***	3.043***	2.992***	3.010***
Homosexual	3.197***	3.197***	3.197***	3.197***	3.197***	3.184***	3.210***
Difference	-0.205***	-0.205***	-0.156***	-0.156***	-0.154***	-0.192***	-0.200***
Endowments	-0.044	-0.133	-0.027	-0.120	-0.125	-0.141	-0.129
Coefficients	-0.130***	-0.113***	-0.096*	-0.086	-0.075	-0.125***	-0.128*
Interaction	-0.030	0.042	-0.033	0.050	0.045	0.073	0.058
N	17,565	17,565	11,512	11,512	10,657	17,565	15,459

Clustered and bootstrapped standard errors in parentheses.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

Sexuality is identified by observation (columns 1–5.7), identified across the sample (column 6). Models are by columns: (1) baseline model (2) with occupation controls (3) coupled respondents only (4) with occupation controls, coupled respondents only (5) with occupation controls, partner characteristics, coupled respondents only (6) with occupation controls (7) with personality controls.

Source: HILDA.

The results of the aggregate decomposition for males are consistent with the OLS results. There is no statistically significant difference in mean log wages of homosexual and heterosexual men with and without occupational controls. Changing the identification strategy for homosexuality (column 6) does not change this. When the sample is restricted to couples (columns 3–5), there is a statistically significant difference in mean log wages. The results indicate that the gap is driven by different returns to characteristics, not endowments of them. In fact, the differences in returns to characteristics over-explain the mean log wage gap, indicating that gay men's endowments must make up for some of the gap due to lower returns to characteristics (though this effect is not significant).

The results of the Blinder–Oaxaca decomposition also demonstrate that the returns to characteristics are significantly different between heterosexual and homosexual men even where there is no statistically significant difference in mean log wages. The detailed decomposition results indicate that there is no statistically significant difference in the returns to personality traits for gay and straight men (detailed results available on request). Hence, being agreeable or extroverted affects wages in the same way regardless of sexual orientation.

The decomposition of mean log wages of women is also consistent with the results of the OLS model discussed above. In all cases, however, the differences in mean log wages for heterosexual and homosexual women are statistically different, with lesbians attracting higher mean wages. As with men, none of this difference is due to differences in endowments; all is due to differences in returns to characteristics (Coefficients).

Including the characteristics of partners (column 5) again has little effect on the estimates, and the results of the detailed composition indicate that there are no differences in the returns to partner characteristics based on sexual orientation. Including personality characteristics changes the estimate for the returns to characteristics by a small amount (column 7). This intuitively suggests that different returns to personality between lesbian and heterosexual women may exist. However, the fact that differences in endowments remain statistically insignificant (the detailed decomposition results show no statistical difference between the endowments of or the returns to personality traits) debunks the potential link between the common stereotype of lesbians as having more masculine personality traits and their tendency to be higher paid.

## Discussion

Overall, the results indicate that there are significant differences in wages between heterosexual and homosexual workers that cannot be explained by observable characteristics. In addition to those listed above, further robustness checks on the results have been undertaken, including aggregating education and occupational status. None of these robustness checks alters the interpretation. The analysis demonstrates that personality characteristics do not explain differences in wages based on sexual orientation for either women or men. The results are well within the range of the existing literature and suggest that previous results may be robust to the exclusion of personality controls. Gay men suffer a gap, while lesbians receive a premium. The estimates for women are slightly less robust than the estimates for men.

Any theory of wage gaps must be able to explain these differences for gay men and women. One view focuses on household specialisation (in home and market production) and income. The effects of within-household specialisation are difficult to identify within same-sex households because in the aggregate effect any penalties or premiums may cancel out. In the analysis above, when the comparison group was restricted to couples, the estimated gap for males changed (though not statistically), and for women, the gap became insignificant. Including the characteristics of one's partner into the regression made very little additional difference to the estimates. If anything, these results favour a rejection of an income effect, suggesting in fact that partnered heterosexual women do not invest less in human capital for market production than single women.

For men, the wage gap becomes larger when the sample is restricted to couples. This could be interpreted as a 'marriage premium' effect for heterosexual men that in turn reflects differences in specialisation for heterosexual men that are not apparent for men in gay couples. However, controlling for partner characteristics does not change the estimated gaps. This indicates that income is not a likely explanation. At the same time, the effect of having a partner work full time is the same for women and men. This is inconsistent with the notion that gender-based income effects are likely to impact female, male and mixed gender households differently. There is therefore a lack of empirical support for the household specialisation explanation for sexual orientation wage gaps.

Do the estimated gaps indicate discrimination in the Australian labour market? To be able to interpret the identified differences as wage discrimination, the joint distribution of unobservable characteristics and observable characteristics must not systematically differ across heterosexual and homosexual workers. Unfortunately, there is no way of rigorously assessing the extent to which this is the case. It is not unreasonable to suggest that unobserved investments in human capital would differ between heterosexual and homosexual workers (Black et al., 2003). For example, the fact that heterosexual women are more likely to have children and work part time (two potential indicators of specialisation) suggests that they may also differ along unobservable characteristics. However, this simple fact is not sufficient to violate ignorability. To do so, one must be able to argue that given observable characteristics, unobservable productivity characteristics still differ between gay and straight women. One potential avenue for this is via *expectations* of having children. For women in particular, if the expectation of having children is correlated with unobserved investments in human capital, then the estimates of the wage premium for lesbians would be biased. On the other hand, if employers interpret women being in a same sex relationship as reducing their likelihood of child-bearing, then they may also reward lesbians with higher pay. A lack of other explanations and the robustness of the identified gaps for males suggest that in the case of gay men in particular, direct discrimination may be a reasonable conjecture.

The estimated gaps in this article reflect differences in wages that cannot be attributed to observable characteristics. If observable characteristics are themselves a response to discrimination, and these characteristics lower productivity, then the total effect of discrimination on wages is higher. This form of discrimination will not be picked up here. The estimates in this article are conditional on observable characteristics. Intuitively, if gay men acquire lower levels of education because of discrimination in educational institutions and education increases wages, then the true impact of discrimination on wages

is greater than the effect I present. Here I am interested in whether gay men are paid less than heterosexual men given equal productivity. In a sense, whether exactly the same man is paid less merely due to his sexual preference. The results suggest that this may indeed be the case in Australia.

## Conclusion

Using data from the household panel HILDA, I have established that there are significant unexplained gaps in wages along lines of sexual orientation. In Australia, women in same-sex relationships earn a positive wage premium of 0%–13%, whereas men in same-sex relationships experience a negative wage premium of 8%–18% depending on the model. These gaps are economically significant and consistent with those found internationally. This article suggests that there are grounds for concern that workers in Australia, particularly gay men, are discriminated against because of their sexual orientation.

This is the first article to control directly for personality traits in explaining the sexual orientation wage gap, based on work by Nyhus and Pons (2005, 2012). Using OLS and Blinder–Oaxaca decomposition methods, the battery of these personality traits is explicitly included in wage regressions. Personality traits are clearly not the driving factor behind the sexual orientation wage gap.

Wage discrimination is both morally reprehensible and economically inefficient. The purpose of this study was to investigate whether in Australia there are grounds for concern that workers may suffer wage discrimination due to their sexual orientation. That is, it sought to provide evidence that individuals may be underpaid as a result of nothing other than their sexual preference. The article does not provide evidence for or against other forms of discrimination. On the whole, the results suggest there are some grounds for concern. However, taking the results of this study alone, it is not possible to draw strong policy recommendations. A range of possible policy mechanisms, including better enforcement of existing anti-discrimination provisions, education and incentive mechanisms are all possible remedies to the identified wage gaps. Further research however is required to understand how and why these wage gaps occur, and what the most effective mechanisms for tackling them may be.

## Supplemental Material

Supplementary Material for this article can be found at the following link: <http://elr.sagepub.com/content/by/supplemental-data>

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## Notes

1. The data used in this article were extracted using the Add-On package PanelWhiz v3.0 (Nov 2010) for Stata. PanelWhiz was written by Dr John P. Haisken-DeNew (john@panelwhiz.eu). The PanelWhiz-generated DO file to retrieve the Household Income and Labour Dynamics in Australia (HILDA) data used here and any Panelwhiz Plugins are available upon request. Any data or computational errors in this article are my own. Haisken-DeNew and Hahn (2010) describe PanelWhiz in detail.
2. Wages are deflated using Organisation for Economic Cooperation and Development (OECD) (2012) deflators with 2005 as the base year. Observations with missing values were discarded.

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## Author biography

Andrea La Nauze is a PhD student in Economics at the University of Melbourne. She holds a Masters of Economics, a Bachelor of Arts and a Bachelor of Commerce (Honours). She is an applied econometrician with a strong policy focus. Her primary field is environmental economics. Prior to commencing the PhD, she was Senior Economist in the Department of Sustainability and Environment in the Victorian Government.

## Appendix I

### *Measurement of the Big Five personality traits in Household Income and Labour Dynamics in Australia (HILDA)*

The following text explains the construction of the Big Five personality measures. It has been reproduced from the HILDA User Manual.

In wave 5, respondents were questioned on their personality character traits using a 36-item inventory. The approach used was based on the trait descriptive adjectives approach used by Saucier (1994), which in turn was based on the approach employed by Goldberg (1992), both of which assume a 5-factor structure (as is commonly assumed in the literature). Not all 36 items, however, are used in the five derived scales summarising the five personality factors. First, the ex ante scales were tested for item reliability, with any items omitted if item total correlation was less than 0.3. Second, principal components analysis with a five-factor solution was undertaken, with items only retained if their highest factor loading was on the expected factor, exceeded 0.4 and exceeded the second highest factor loading by at least 0.1. A slightly different approach to derivation of these scales, but which obtains identical conclusions, is provided in Losoncz (2009).

The five scales based on the Big Five ... are composed by taking the average of the following items:

- Extroversion – talkative, bashful (reversed), quiet (reversed), shy (reversed), lively and extroverted.
- Agreeableness – sympathetic, kind, cooperative and warm.
- Conscientiousness – orderly, systematic, inefficient (reversed), sloppy (reversed), disorganised (reversed) and efficient.
- Emotional stability – envious (reversed), moody (reversed), touchy (reversed), jealous (reversed), temperamental (reversed) and fretful (reversed).
- Openness to experience – deep, philosophical, creative, intellectual, complex and imaginative.

The higher the score, the better that personality character trait describes the respondent. The items and derived scales were repeated in wave 9.

Source: Summerfield et al. (2013).

**Appendix 2.** Male and female sexuality wage gaps identified using ordinary least squares.

	Male log hourly wages			Female log hourly wages		
	(1)	(2)	(3)	(4)	(5)	(6)
Age	-0.003 (0.002)	-0.006** (0.002)	-0.002 (0.002)	0.000 (0.001)	-0.002 (0.001)	0.001 (0.001)
Postgraduate	0.664*** (0.085)	0.590*** (0.062)	0.533*** (0.079)	0.566*** (0.036)	0.570*** (0.040)	0.361*** (0.039)
Graduate diploma	0.548*** (0.084)	0.489*** (0.061)	0.429*** (0.078)	0.482*** (0.033)	0.472*** (0.036)	0.278*** (0.035)
Bachelor	0.555*** (0.082)	0.475*** (0.058)	0.453*** (0.075)	0.426*** (0.031)	0.431*** (0.033)	0.251*** (0.033)
Diploma	0.382*** (0.082)	0.312*** (0.058)	0.322*** (0.075)	0.275*** (0.032)	0.278*** (0.035)	0.168*** (0.033)
Certificate III	0.266*** (0.080)	0.180** (0.055)	0.255*** (0.073)	0.120*** (0.030)	0.108** (0.033)	0.070* (0.031)
Certificate I or II	0.039 (0.100)	0.000 (.)	0.043 (0.093)	0.000 (.)	0.000 (.)	0.000 (.)
Other certificate	0.000 (.)	-0.115 (0.091)	0.000 (.)	0.016 (0.066)	-0.006 (0.075)	-0.020 (0.059)
Year 12	0.214** (0.081)	0.182** (0.057)	0.196** (0.074)	0.148*** (0.030)	0.170*** (0.034)	0.087** (0.031)
Year 11	0.099 (0.080)	0.052 (0.055)	0.111 (0.073)	0.051 (0.030)	0.057 (0.032)	0.023 (0.031)
Work experience (years)	0.009*** (0.002)	0.010*** (0.002)	0.009*** (0.002)	0.005*** (0.001)	0.004** (0.001)	0.003* (0.001)
New South Wales	-0.065 (0.052)	-0.078* (0.039)	-0.039 (0.035)	-0.092*** (0.026)	-0.019 (0.066)	-0.049 (0.028)
Victoria	-0.090 (0.053)	-0.104** (0.039)	-0.067 (0.035)	-0.150*** (0.026)	-0.078 (0.066)	-0.117*** (0.028)
Queensland	-0.107* (0.052)	-0.132*** (0.039)	-0.073* (0.035)	-0.164*** (0.026)	-0.087 (0.066)	-0.116*** (0.028)
South Australia	-0.155** (0.055)	-0.179*** (0.043)	-0.119** (0.039)	-0.165*** (0.029)	-0.069 (0.067)	-0.120*** (0.031)
Western Australia	-0.040 (0.054)	-0.029 (0.043)	-0.014 (0.039)	-0.121*** (0.029)	-0.052 (0.068)	-0.091** (0.030)
Tasmania	-0.224*** (0.057)	-0.228*** (0.045)	-0.171*** (0.042)	-0.175*** (0.034)	-0.113 (0.069)	-0.135*** (0.035)
Northern Territory	0.000 (.)	-0.018 (0.063)	0.020 (0.060)	-0.091 (0.051)	0.000 (.)	-0.048 (0.047)
Australian Capital Territory	0.000 (0.061)	0.000 (.)	0.000 (.)	0.000 (.)	0.061 (0.070)	0.000 (.)

(Continued)

## Appendix 2. (Continued)

	Male log hourly wages			Female log hourly wages		
	(1)	(2)	(3)	(4)	(5)	(6)
Job tenure (years)	0.002* (0.001)	0.002** (0.001)	0.001 (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.003** (0.001)
Labour force status (full time)	0.105*** (0.016)	0.087*** (0.023)	0.074*** (0.017)	0.003 (0.009)	-0.021 (0.011)	-0.039*** (0.009)
No. children	0.025*** (0.005)	0.010 (0.006)	0.021*** (0.005)	0.013* (0.005)	0.005 (0.006)	0.010 (0.005)
Occupational tenure (years)	0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.004*** (0.001)	0.002** (0.001)
Birthplace (0=Australia)	0.025 (0.019)	0.002 (0.021)	0.017 (0.020)	0.018 (0.015)	-0.000 (0.017)	0.021 (0.015)
Language (0=English first language)	0.069* (0.028)	0.089** (0.031)	0.046 (0.030)	0.021 (0.022)	0.022 (0.026)	-0.018 (0.022)
Works in small to medium enterprise	-0.180*** (0.011)	-0.166*** (0.013)	-0.171*** (0.011)	-0.102*** (0.009)	-0.107*** (0.011)	-0.100*** (0.009)
Union member	0.033** (0.012)	0.020 (0.013)	0.052*** (0.012)	0.028** (0.010)	0.018 (0.012)	0.030** (0.010)
Sexuality	-0.093* (0.042)	-0.159*** (0.041)	-0.136*** (0.033)	0.131* (0.051)	0.096 (0.051)	0.128* (0.057)
Manager			0.218*** (0.025)			0.232*** (0.028)
Professional			0.186*** (0.025)			0.220*** (0.025)
Trade			0.047* (0.023)			0.000 (.)
Community worker			0.072** (0.026)			-0.026 (0.025)
Clerical			0.067** (0.024)			0.072** (0.024)
Sales			0.000 (.)			-0.067** (0.025)

(Continued)

**Appendix 2. (Continued)**

	Male log hourly wages			Female log hourly wages		
	(1)	(2)	(3)	(4)	(5)	(6)
Plant and machinery operator			0.045 (0.024)			0.007 (0.050)
Labourer			-0.043 (0.024)			-0.142*** (0.031)
Agreeableness			-0.039*** (0.008)			-0.014* (0.006)
Conscientiousness			0.032*** (0.007)			0.015*** (0.005)
Emotional stability			-0.003 (0.006)			0.004 (0.005)
Extroversion			-0.002 (0.006)			0.008 (0.004)
Openness to experience			0.012 (0.007)			-0.008 (0.005)
Constant	2.664*** (0.111)	2.940*** (0.090)	2.650*** (0.100)	2.768*** (0.050)	2.835*** (0.078)	2.809*** (0.055)
Observations	17,049	11,669	15,049	17,565	11,512	15,459
R <sup>2</sup>	0.282	0.225	0.316	0.232	0.216	0.289
F	99.847	52.599	68.772	100.887	68.603	82.955

Clustered standard errors in parentheses.

\*p < 0.05; \*\* p < 0.01; \*\*\*p < 0.001.