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The Costs of Being "Different": Sexual Identity and Subjective Wellbeing over the Life Course in Contemporary Australia

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NON-TECHNICAL SUMMARY

In the last few decades there have been vast social transformations concerning gender and sexuality. These have resulted in the emergence of more accepting views towards individuals from sexual minorities (such as homosexual and bisexual people). Importantly, discrimination on the grounds of sexual identity has been outlawed in Australia and other developed countries (such as the UK and the US), and scientists and practitioners no longer consider people with non-heterosexual identities as 'sick' or 'deviant'. Despite this, there is evidence that individuals from sexual minorities are still stigmatized and discriminated against in more subtle ways, and are often victims of hate crimes and bullying because of their sexual orientation. These stressful situations are believed to have negative impacts on their lives.

In this paper, I test whether this is the case for contemporary Australian society, considering four indicators of subjective wellbeing: mental health, life satisfaction, psychological distress, and feelings of safety. Results suggest that gay, lesbian and bisexual people score substantially and significantly worse in all of these outcomes than do heterosexual people. Additionally, I examined whether the disparities disfavouring individuals from sexual minorities are more pronounced at different points of the life course. Findings indicate that such disparities are in fact larger at earlier ages and close as individuals grow old.

Altogether, the results from this study suggest that current Australian policies are insufficient in preventing the systematic exclusion of individuals from sexual minorities. New policies, particularly policies aimed at addressing the needs of teenagers and young adults, are urgently required. New policies might be more effective if they target contexts to which young people are most exposed, including educational environments such as schools and universities.

Equality of opportunity is one of the fundamental principles in Australian society, as well as in other developed countries, and we have gone a long way in closing gender, racial, and disability gaps. There is however little awareness of how the life experiences of individuals of sexual minorities differ from those of the heterosexual majority, and little has be done to prevent this from leading to systematic exclusion and cycles of disadvantage. The findings of this research help us gain a better understanding of the factors that hinder equality of opportunity by sexual orientation and can help devise strategies to address these.

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Abstract

Vast social transformations in recent decades have resulted in the emergence of a socio-political climate that is progressively more accepting of sexual minorities. However, sexual identity remains an important aspect influencing people's lives, and is believed to have independent effects on subjective wellbeing via stigmatization and discrimination of sexual minorities. We use recently available, nationally representative, Australian panel data (n≈15,000 individuals & 111,000 person-year observations) and panel regression models to provide the most encompassing and generalizable empirical account to-date of how sexual identity influences a range of subjective wellbeing outcomes, including mental health, life satisfaction, psychological distress and feelings of safety, and how its effects evolve over individuals' life courses. We find that the subjective wellbeing of gay, lesbian and bisexual individuals is significantly worse than that of heterosexual individuals. Disparities are most apparent during adolescence and early adulthood and tend to close as people age, especially for bisexual individuals.

Keywords: sexual identity, minority stress, life course, wellbeing, Australia

1. Introduction

Vast social transformations concerning gender and sexuality have taken place in developed countries over the past few decades (Giddens 1992, Castells 1997). These have included the emergence of a more accepting public and policy climate towards individuals with non-heterosexual sexual identity, such as those who identify as gay, lesbian or bisexual (Hicks and Lee 2006, Anderson and Fetner 2008). For example, in 1983 76% of Australians believed that homosexuality was unjustifiable, while 32% would not like to have homosexuals as neighbours. By 2012, these had fallen to 38% and 14%.[1] Similarly, prevailing psychological discourses on homosexuality shifted markedly from a 'homosexuality-as-sickness' script up to the 1970s to a 'homosexuality-as-identity' narrative thereafter (Hammack et al. 2013). Despite this, sexual identity remains a key social marker, and is progressively permeating the public, political, and legal spheres in developed nations, as reflected by ongoing debates about gay marriage, child adoption by same-sex couples, or homophobic school bullying, workplace harassment and hate crime.

One of the areas on which academic research on sexual orientation has been most prolific is on the potential association between sexual orientation and subjective wellbeing, referring to a broad set of interrelated affective, cognitive, and emotional processes and phenomena that together capture non-physical aspect of health and wellbeing. Theoretical models in psychology, sociology, and economics suggest that structural pressures such as discrimination, stigmatization, and minority stress pose negative influences on the wellbeing of individuals of sexual minorities. Consistent with this, empirical studies have found that, relative to the heterosexual population, sexual minorities have poorer mental health and lower self-esteem, and experience higher rates of anxiety, depression, self-harm, suicidal ideation, and suicide attempts - see reviews by Institute of Medicine (2011), King et al. (2007), and Uhrig (2014). The outcomes of sexual minorities in Australia are no less worrisome than those of their more researched American and British counterparts, with results from recent research indicating that 33% of them had harmed themselves and 16% had attempted suicide (Robinson et al. 2014), or that 41% percent of gay and bisexual people had suffered a recent mental disorder compared to 20% of the heterosexual population (Australian Bureau of Statistics 2008).

[1] Own calculations using the 1983 Australian Values Study Survey and the 2012 World Values Survey (available from the Australian Data Archive at http://www.ada.edu.au/).

In this paper, we aim to provide an encompassing empirical account of how the sexual identity of individuals in Australia associates with their subjective wellbeing. We add to the literature by (i) establishing findings that are generalizable to the Australian population virtue of our use of a large-scale, nationally representative, panel dataset, (ii) examining how the impact of sexual identity on subjective wellbeing evolves over the life course, and (iii) considering a more encompassing set of outcomes to capture subjective wellbeing than previous studies, including mental health, life satisfaction, psychological distress, and feelings of safety.

2. Sexual identity, minority stress and subjective wellbeing

In sociological analysis, homosexuality and bisexuality fall into the category of 'moral panic': an ill-founded supposed threat inducing feelings of concern amongst members of society; with the 'folk devils' responsible for the threat - in this case sexual minorities – being labelled as deviants (Goode and Ben-Yehuda 1994). Most societies operate under heteronormativity, whereby a set of established cultural, legal, and institutional arrangements help maintain normative assumptions that only opposite-sex romantic or sexual relationships are natural or acceptable (Schilt and Westbrook 2009). Heterosexuality becomes the norm, the normal state of affairs, whereas other sexual preferences, behaviors, and identities fall into the realm of the non-normal, or abnormal. Failure to conform to social norms and cultural imperatives is penalised through stigmatization (Goffman 1990). In the case of sexual minorities, the literature documents negative or fearful attitudes about and prejudice against homosexual individuals (homophobia), bisexual individuals (bi-phobia) and transsexual individuals (trans-phobia). Such negative feelings often translate into differential treatment by ascription to the target group (discrimination), which compromises the ability of its members to fully participate in society and realize their potential (social exclusion). The most compelling theoretical application of these theories to how stigmatization and discrimination affects the subjective wellbeing of sexual minorities is made by advocates of 'minority stress theory' (Herek and Garnets 2007), and is best represented by the seminal work of Meyer (1995, 2003). Despite legal reforms outlawing most forms of direct discrimination on the grounds of sexual orientation in many developed countries including Australia (Roseneil et al. 2013), discrimination and stigmatization operate through more subtle and indirect channels including intrapersonal appraisals (self-stigma), interpersonal events such as hate crimes, and structural conditions such as laws and unwritten community

norms (Hatzenbuehler et al. 2010, 2014).[2] Based on this literature, we make the following testable hypothesis:

> *Hypothesis 1: In the context of contemporary Australia, subjective wellbeing will be poorer amongst sexual minorities than amongst the heterosexual population.*

The existing body of empirical research on the effects of sexual minority status on different facets of subjective wellbeing has grown rapidly. Consistent with the theoretical premises outlined before, the empirical evidence suggests that homosexual and bisexual individuals have worse mental health than heterosexual individuals and experience higher rates of distress, anxiety, and depression (Fergusson et al. 2005, Jorm et al. 2002, King et al. 2003, Ueno 2005, 2010, Wright and Perry 2006). Research on other dimensions of subjective wellbeing is less extensive, though negative associations have been reported between sexual minority status and perceived feelings of isolation (Hatzenbuehler et al. 2012), self-harm (Robinson et al. 2014), suicidal ideation (Jorm et al. 2002), suicide attempts (Russell and Toomey 2012), and actual suicide (Mathy et al. 2011).

Until recently, the bulk of existing evidence on these issues was based predominantly on small, non-probability samples (Purdam et al. 2008, Ueno 2005, Uhrig 2014). This scarcity can be traced back to the absence of questions on sexual identity in large-scale general-population multipurpose survey datasets. As sexual identity becomes less of a *taboo* topic, some major social surveys have begun to collect such data, and a small but rapidly growing body of evidence is emerging (see e.g. Silenzio et al. 2007, Bostwick et al. 2010, Hatzenbuehler et al. 2010, Needham and Austin 2010, Ueno 2010, Martin-Storey et al. 2012, Needham 2012). However, most of these studies focus on specific population groups such as students or adolescents, which restricts the generalizability of findings to the wider population. This is the case, for example, for studies using the US National Longitudinal

[2] Direct discrimination on the grounds of sexual identity is outlawed in Australia (Fair Work Act 2009 & Sex Discrimination Amendment [Sexual Identity, Gender Identity and Intersex Status] Bill 2013), as is in other developed countries such as the UK (Equality Act [Sexual Identity] Regulations 2007 & Equality Act 2010) and the US (Executive Orders 12968 & 13087). Such legislation is more prevalent in the labour domain (i.e. on matters of employment, work and training), though progressively more protective of sexual minorities in other social spheres, including access to goods and services, the exercise of public functions, and full participation in the education, health and housing realms (Roseneil et al. 2013).

Study of Adolescent Health (Add Health) (e.g. Ueno 2010, Needham and Austin 2010, Needham 2012, Silenzio et al. 2007) or the US Study of Early Child Care and Youth Development (SECCYD) (Martin-Storey et al. 2012). There are no studies focusing on Australia, despite the worrying trends depicted in the introductory section.

3. The influence of minority stress on subjective wellbeing over the life course

Sociological life course perspectives suggest that time and context are key aspects influencing human development and highlight how *"chronological age, relationships, common life transitions, and social change shape people's lives from birth to death"* (Hutchison 2011, p.8). Concerning sexual orientation, it has been argued that belonging to a sexual minority is not only experienced differently across societies and time periods, but also at different points of individuals' life courses. Of particular interest here is the possibility that sexual minority status is more detrimental to subjective wellbeing during some life stages than others.

One possibility is that sexual minority status will have more negative impacts on the subjective wellbeing of individuals during early life than later on. One reason for this is that external pressures such as discrimination and stigmatization which negatively affect subjective wellbeing may be more prevalent in contexts and settings to which young people are particularly exposed, including the education system and early labour market experiences. Research on the former is particularly extensive, with a large body of evidence documenting the pervasiveness and consequences of homo-/bi-/trans-phobic school bullying (Rivers 2011, Trenchard and Warren 1984, Ueno 2005). Schools are where the bigger bulk of homophobic acts against young people occur, with abuse allegedly been committed not only by peer students but also by teachers and other staff (Robinson et al. 2014). The manifestations of such abuse range from name calling, exclusion from peer groups, cyberbullying, and the spread of false rumours to marginalisation, public humiliation, and physical abuse, with consequences for students of sexual minorities that include inability to concentrate, truancy, fear of social spaces (such as changing rooms, canteens and public toilets), being forced to change schools, and worsened academic performance (Robinson et al. 2014, Uhrig 2014). Additionally, schools are highly hierarchical environments in which hegemonic masculinity is exalted (e.g. physical activity lessons and sport competitions), feature curricula where non-

normative sexual preferences are invisible or stigmatised, and are contained environments where sexual identity can become the basis of minority status.

Besides heightened external pressures, other internal pressures may only apply when individuals of sexual minorities are young or operate more strongly during youth. For example, anxiety and struggles about discovering one's sexual identity (Lock and Steiner 1999) and constant self-monitoring to ensure its concealment and prevent its accidental disclosure (Frable et al. 1998) might be additional stressors for young people. The actual process of 'coming out' (or 'being outed') - often a traumatic life event for individuals of sexual minorities and their families - also tends to take place in adolescence or early adulthood, coinciding with other major and stressful identity formation processes (Rossi 2010, Robinson et al. 2014). Furthermore, adolescents of sexual minorities may be less prepared or have fewer means to protect themselves from bullying and harassment (DiFulvio 2011). For instance, relative to adult members of sexual minorities, young individuals with homosexual or bisexual identities have poor social connectedness and lack access to closely knit friendship networks or gay communities that might offer support (Hatzenbuehler et al. 2012, Ueno 2005). In the light of this, we formulate a second testable hypothesis stating that:

> *Hypothesis 2: Disparities in subjective wellbeing by sexual identity will already be apparent during adolescence and will be more pronounced then than later in life.*

An alternative possibility is that sexual minority status will have progressively more negative impacts on the subjective wellbeing of individuals as they age. In sociology, 'cumulative disadvantage' theory posits that the advantage of one individual or group over another accumulates over time, and so inequality of this advantage tends to grow (DiPrete and Eirich 2006). Health and wellbeing applications of 'cumulative disadvantage' theory highlight how stressors proliferate over the life course and widen health gaps between advantaged and disadvantaged group members (Willson et al. 2007, Thoits 2010). The theory has mostly been used to explain outcome disparities on the basis of gender, ethnicity, social class and education, but can be extended to disparities due to sexual identity. Drawing upon this, it can be argued that individuals of sexual minorities who have experienced prolonged exposure to an antagonistic social environment and/or sustained issues managing their identities (i.e.

long-running minority stress) will experience poorer outcomes than younger sexual minority individuals. Additionally, discrimination may be more consequential during adulthood than adolescence, as it encompasses additional life domains such as employment relations, family formation, income, and contact with official institutions. Based on this, we formulate a third testable hypothesis that stands in direct confrontation to Hypothesis 2. This states that:

> *Hypothesis 3: Disparities in subjective wellbeing by sexual identity will be more pronounced during late adulthood and old age than earlier in life.*

To our knowledge, there are no previous empirical quantitative studies that use a longitudinal, life-course approach to explore sexual identity and subjective wellbeing (see also Institute of Medicine 2011). This paucity of evidence is understandable, as the data required to undertake this sort of research must include, at the very least, information on sexual identity as well as repeated measures of subjective wellbeing over time. In the remainder of this article we aim to fill this vacuum.

4. Data and methods

To examine the relationships between sexual identity and different dimensions of subjective wellbeing and test our research hypotheses we undertake secondary data analysis of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey is a large, multipurpose, nationally representative, panel survey which collects annual information from its participants, and is part of the Cross-National Equivalence File (Summerfield et al. 2013).

In its 12th wave (2012) the survey includes, for the first time, a question designed to collect information on respondents' sexual identity. To minimize measurement error and social desirability bias and boost response rates, this survey item was located within a self-complete questionnaire, rather than within the face-to-face interview. It reads: *"Which of the following categories best describes how you think of yourself?"*, with possible answers being: 'heterosexual or straight', 'gay or lesbian', 'bisexual', 'other', 'unsure/don't know', and 'prefer not to say'. Given their small sample size and our inability to discern the reasons why individuals fall into them, we collapse the categories 'other', 'unsure/don't know', and

'prefer not to say' as well as the missing value for 'refused/not stated' into a single group ('other response') and omit the results. Hence, our key focus is on differences between self-disclosed heterosexual, gay, lesbian, and bisexual individuals. The distribution of responses to this question in wave 12 of the survey can be seen in Table 1.

Table 1. Distribution of responses to the sexual identity question, wave 12

	All		Men		Women	
	n	%	n	%	n	%
Heterosexual	13,833	92.6	6,511	93.2	7,322	92.0
Gay/lesbian	216	1.5	119	1.7	97	1.2
Bisexual	205	1.4	63	0.9	142	1.8
Other response	690	4.6	293	4.2	397	5.0
n (individuals)	14,944	100	6,986	100	7,958	100

Note: HILDA Survey data (2012).

In an overwhelming majority of the nearly 15,000 recorded responses participants describe themselves as 'heterosexual or straight' (92.6%). Just below 3% identify as being part of a sexual minority: 1.5% report thinking of themselves as 'gay or lesbian' and a further 1.4% as 'bisexual'. The remaining 4.6% of respondents fall into the 'other response' category. A higher share of men than women identify as heterosexual (93.2% vs. 92%) or gay/lesbian (1.7% vs. 1.2%), whereas a larger share of women than men identify as bisexual (1.8% vs. 0.9%) or fall into the 'other response' category (5% vs. 4.2%).

How do these figures compare to other national and international estimates? The earlier Australian Study of Health and Relationships (Smith et al. 2003) shows a slightly lower but comparable prevalence of homosexual sexual identity (1.6% amongst men and 0.8% amongst women) and bisexual sexual identity (0.8% amongst men and 1.4% amongst women). The figures in the HILDA Survey are also similar to those in the 2013 wave of the UK Household Longitudinal Study (*Understanding Society*), where 1.3% and 1% of the British population self-identify as gay/lesbian and bisexual, respectively (Uhrig 2014).

If one assumes that sexual identity is fairly constant within individuals over time, it is possible to extrapolate the information collected in wave 12 of the survey to any previous observation in waves 1 to 11 of individuals who participated in it, and to move from fairly simple cross-sectional analyses of that particular survey year to more complex and informative longitudinal analyses of up to 12 years. While doing this is not optimal due to the

fluidity of sexual identities, sensitivity checks suggest that biases to our results are likely to be minor (see Discussion section). In any case, our analyses should be interpreted as unveiling prior wellbeing trajectories based on current sexual identity, which may not coincide with sexual identity in each of the observation points. When undertaking this backwards extrapolation, the distribution of person-year observations for the sexual identity variable, shown in Table 2, is similar to that in Table 1. The numbers are however visibly larger, as individuals appear on the survey 7.4 times on average.

Table 2. Distribution of responses to the sexual identity question, all survey waves

	All		Men		Women	
	n	%	n	%	n	%
Heterosexual	102,749	92.7	47,610	93.3	55,139	92.2
Gay/lesbian	1,505	1.4	770	1.5	735	1.2
Bisexual	1,300	1.2	478	0.9	822	1.4
Other response	5,248	4.7	2,164	4.2	3,084	5.2
n (observations)	110,802	100	51,022	100	59,780	100

Note: HILDA Survey data (2001-2012).

Our outcome variables are different measures of subjective wellbeing collected in the HILDA Survey data. We choose these measures both because of availability and because they either have been previously used in empirical research assessing gender and sexual identity differences or are approximate theoretical constructs. First, we use the Mental Components Summary (MCS) of the SF-36 Medical Outcomes Questionnaire as a summary indicator of overall mental health (Ware and Sherbourne 1992). This is by far the most widely used measure and the 'gold standard' in mental health survey research. Second, we use a measure of self-reported satisfaction with life overall, in which respondents are asked to rate their contentment on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). This variable captures more global evaluative assessments of individuals' subjective wellbeing and unlike measures of affect (e.g. happiness) requires effort and comparison making (Frey and Stutzer 2002). Third, we use a measure of feelings of safety based on individuals' ratings of their satisfaction with 'how safe they feel' on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). This construct is particularly relevant for comparisons by sexual identity because it should approximately capture experiences of bullying and harassment (Robinson et al. 2014). Fourth, we use a summary measure of the Kessler Psychological Distress Scale designed to capture levels of non-specific psychological distress and

depressive symptoms (Kessler et al. 2002). This instrument is extensively used in social psychology to explore the consequences of interpersonal problems (Ueno 2005), and is based on responses to a battery of 10 questions about how often in the past 4 weeks respondents experienced different feelings, including feeling 'tired for no good reason', 'nervous', 'so nervous that nothing could calm you down', 'hopeless', 'restless or fidgety', 'so restless that you could not sit still', 'depressed', 'that everything was an effort', 'so sad that nothing could cheer you up', and 'worthless'. Possible responses are in a 5-Point Likert scale: 'All the time', 'Most of the time', 'Some of the time', 'A little of the time', and 'None of the time'. Unfortunately, the subset of variables used to arrive at a summary measure of psychological distress is only available in waves 7 (2007), 9 (2009), and 11 (2011) of the survey and so analyses of this outcome are restricted to those data points. To be able to compare effects across specifications, all outcomes have been ordered and rescaled so that they have minima of 0 (worst possible outcome) and maxima of 100 (best possible outcome).[3]

To account for the clustering of observations within individuals and exploit the longitudinal structure of the HILDA Survey data we fit linear random-effect specifications. This regression technique for the analysis of panel data is superior to ordinary least squares (OLS) regression and uses the optimal combination of the between and within individual variability in the dataset to model unobserved heterogenity via the estimation of a person-specific random intercept (Wooldridge 2010). The models we fit can be formally expressed as:

$$W_{it} = S_i\beta + X_{it}\gamma + u_i + e_{it} \qquad (1)$$

… where the i and t subscripts stand for individual and time, respectively; W is a given subjective wellbeing outcome; S is a set of dummy variables denoting individuals' sexual identity; X is a vector of time-varying and time-constant control variables known to influence subjective wellbeing including gender, age in years and its square, partnership status, education, parenthood, employment status, presence of a long-term health impairment, degree of religiosity, yearly disposable household income, residence in an urban location, time of

[3] While some of the outcome variables correlate highly (the highest association occurring between mental health and psychological distress, r=0.79), we argue that these are different enough both conceptually and empirically to merit separate analysis.

interview, and a summary scale of perceived social support;[4] u is a person-specific effect assumed to come from a normal distribution and to be orthogonal to the observable variables; β and γ are vectors of coefficients to be estimated; and e is the usual stochastic error term in regression. Descriptive statistics for all variables used in regression models are reported in Table A1 in the Appendix.

5. Empirical analyses

5.1 Subjective wellbeing by sexual identity in contemporary Australia

The first part of our analysis is devoted to establishing whether sexual identity is associated with subjective wellbeing in the Australian population, using the HILDA Survey panel data. We begin by comparing mean levels of mental health, life satisfaction, psychological distress, and safety satisfaction by sexual identity. Results using a 'short' version of this variable in which gender is not considered are presented towards the top of Table 3. Heterosexual individuals score higher (i.e. have better outcomes) than sexual minorities, and gay/lesbian individuals higher than bisexual individuals in all outcomes. The largest differences are found for mental health: on a scale from 0 to 100, average scores are 74.6 for heterosexual people, 70.1 for gay/lesbian individuals, and 65.8 percent for bisexual people.

Results using a 'long' version of the sexual identity variable which considers the gender of the respondent are presented towards the bottom of Table 3. These enable us to determine whether substantial differences by gender within sexual identity categories (or *vice versa*) exist. Gender differences within sexual identity groupings are less pronounced, and more nuanced. Amongst heterosexual individuals, men display better outcomes than women in mental health, psychological distress, and safety satisfaction, but worse life satisfaction. Gender differences amongst gay/lesbian individuals are similar, with the exception that lesbian women are happier than gay men with how safe they feel. Amongst bisexual individuals, men score higher than women in all outcomes except for safety satisfaction. Differences by sexual identity are similar for both men and women.

[4] This is an additive scale capturing the degree of support individuals feel that they get from other people. Respondents are asked how much they agree or disagree with 10 statements about whether they feel lonely, get help when they need it, receive visits from and enjoy time spent with others, and whether they consider that they have friends and people to talk to, confide in, cheer them up, or lean on in times of trouble. Possible responses are in a 7-Point Likert scale from 'Strongly agree' to 'Strongly disagree' and have been reversed when necessary so that high agreement always indicates high support - see Berry and Welsh (2010) for further details.

Table 3. Mean values in subjective wellbeing by sexual identity, all available waves

	Mental health	Life satisfaction	Safety satisfaction	Psychological distress
Sexual identity				
Heterosexual	74.6	79.6	82.0	86.8
Gay/lesbian	70.1	77.5	80.3	83.3
Bisexual	65.8	76.8	79.6	80.0
Sexual identity & gender				
Heterosexual men	76.0	79.3	82.8	87.8
Heterosexual women	73.3	79.9	81.3	86.0
Gay men	71.0	77.4	79.1	85.1
Lesbian women	69.1	77.6	81.7	81.4
Bisexual men	67.9	77.1	79.3	81.2
Bisexual women	64.6	76.6	79.7	79.4

Note: HILDA Survey data (2001-2012), except psychological distress (2007, 2009, 2011).

These descriptive results suggest that sexual minority status is related to worse subjective wellbeing, and to a larger extent than gender. However, it is possible that the differences observed in the raw data are the product of confounding factors unevenly distributed by gender or sexual identity, such as age, education, or perceived social support. It is also possible that unobserved traits of individuals account for some of the variation. Consequently, we re-examine these differences in a multivariate framework using random-effect panel regression models that control for observable and unobservable factors potentially associated with gender, sexual identity, and subjective wellbeing. Results of such models are presented in Tables 4 and 5. Table 4 shows the results of models using the short version of the sexual identity variable, plus a control for gender, while Table 5 presents the results of models using the long version of the sexual identity variable, which interacts sexual identity and gender. Model coefficients on the sexual identity categories give the estimated differences between a given grouping and the reference category, 'heterosexual individuals' in models in Table 4 and 'heterosexual men' in models in Table 5, all else being equal.

Table 4. Impact of sexual identity (short version) on subjective wellbeing: random-effect models

	Mental health	Life satisfaction	Safety satisfaction	Psychological distress
Sexual identity				
Heterosexual *(ref. cat.)*				
Gay/lesbian	-4.6***	-1.8**	-2.0**	-3.5***
Bisexual	-5.8***	-1.8**	-1.6*	-3.1***
Gender				
Female	-4.2***	-0.2	-1.8***	-2.4***
Controls				
Age in years	-0.1(*)	-0.5***	-0.4***	-0.0
Age in years (squared)	0.0***	0.0***	0.0***	0.0***
Partnered	1.9***	3.3***	1.3***	1.5***
Highest education qualification				
Below year 12 *(ref. cat.)*				
Year 12	-0.8**	-1.6***	-1.8***	0.6*
Professional certificate	-0.3	-1.2***	-1.4***	0.8***
Degree or higher	-0.5(*)	-1.9***	-0.5*	1.6***
Has children	0.2	0.2	0.7***	-0.3
Employment status				
Unemployed *(ref. cat.)*				
Inactive	-0.1***	0.1***	-0.0	-0.2***
Employed	1.8***	1.9***	0.8**	2.5***
Long-term condition	-4.1***	-2.5***	-1.2***	-4.7***
Religiosity (0-10)	-0.1	1.6***	0.5*	0.3
Yearly household income (in 10,000s)	0.1***	0.1***	0.1***	0.2***
Lives in an urban region	-0.7***	-1.3***	-3.4***	-0.8***
Perceived social support scale (0-100)	0.4***	0.2***	0.2***	0.4***
Wave of interview (1-12)	-0.1***	-0.1***	0.1***	-0.2***
n (observations)	106,447	110,802	110,768	30,845
n (individuals)	15,212	15,295	15,294	13,917
R^2 (overall)	0.28	0.21	0.11	0.32
Rho	0.43	0.41	0.39	0.55

Note: HILDA Survey data (2001-2012), except psychological distress (2007, 2009, 2011). Significance levels: (*) = 0.1, * = 0.05, ** = 0.01, *** = 0.001, two-tailed tests.

Results in Table 4 indicate that mental health differences by sexual identity remain in the presence of statistical controls for observable and unobservable factors. Relative to heterosexual individuals and on a scale from 0 to 100, gay/lesbian individuals score 4.6 units lower in mental health, 1.8 units lower in life satisfaction, 2.0 units lower in safety satisfaction, and 3.5 units lower in psychological distress Despite small sample sizes for sexual minorities, these differences are all statistically significant. Similarly, bisexual individuals score 5.8, 1.8, 1.6, and 3.1 units lower than heterosexual individuals in the

respective outcomes, with all coefficients being again statistically different from zero. Results from Wald tests (not reported) indicate that differences between gay/lesbian and bisexual individuals are not statistically significant in any of the models. Concerning gender, the models indicate that women have significantly poorer outcomes than men in mental health (-4.2 units), safety satisfaction (-1.8), and psychological distress (-2.4), but comparable levels of life satisfaction. The estimated coefficients on the control variables are mostly consistent with expectations and existing research.

Table 5. Impact of sexual identity (long version) on subjective wellbeing: random-effect models

	Mental health	Life satisfaction	Safety satisfaction	Psychological distress
Sexual identity & gender				
Heterosexual men *(ref. cat.)*				
Heterosexual women	-4.2***	-0.3	-1.8***	-2.4***
Gay men	-4.8***	-1.5(*)	-3.5***	-2.6*
Lesbian women	-8.7***	-2.3*	-2.0(*)	-7.0***
Bisexual men	-5.5***	-0.7	-2.1	-2.9*
Bisexual women	-10.1***	-2.6**	-3.2***	-5.6***
Controls [a]	Yes	Yes	Yes	Yes
n (observations)	106,447	110,802	110,768	30,845
n (individuals)	15,212	15,295	15,294	13,917
R^2 (overall)	0.28	0.21	0.11	0.32
Rho	0.43	0.41	0.39	0.55

Note: HILDA Survey data (2001-2012), except psychological distress (2007, 2009, 2011). [a] Model controls as in Table 4. Significance levels: (*) = 0.1, * = 0.05, ** = 0.01, *** = 0.001, two-tailed tests.

Results in Table 5 use the sexual identity variable that further discriminates by gender. These indicate that, when compared to heterosexual men, men and women of sexual minorities score significantly worse in all the subjective wellbeing considered. Only the predicted differences in life satisfaction and psychological distress between bisexual men and heterosexual men do not reach statistical significance at conventional levels. Additionally, results from Wald tests (not shown in the table) generally suggest no statistically significant differences in the subjective wellbeing of (i) gay men and lesbian women, (i) bisexual men and bisexual women, (iii) gay men and bisexual men, and (iv) lesbian women and bisexual women. This is most likely due to small cell sizes in each of the two groups involved in the comparison, as the magnitude of some of the differences appears to be substantial. There are

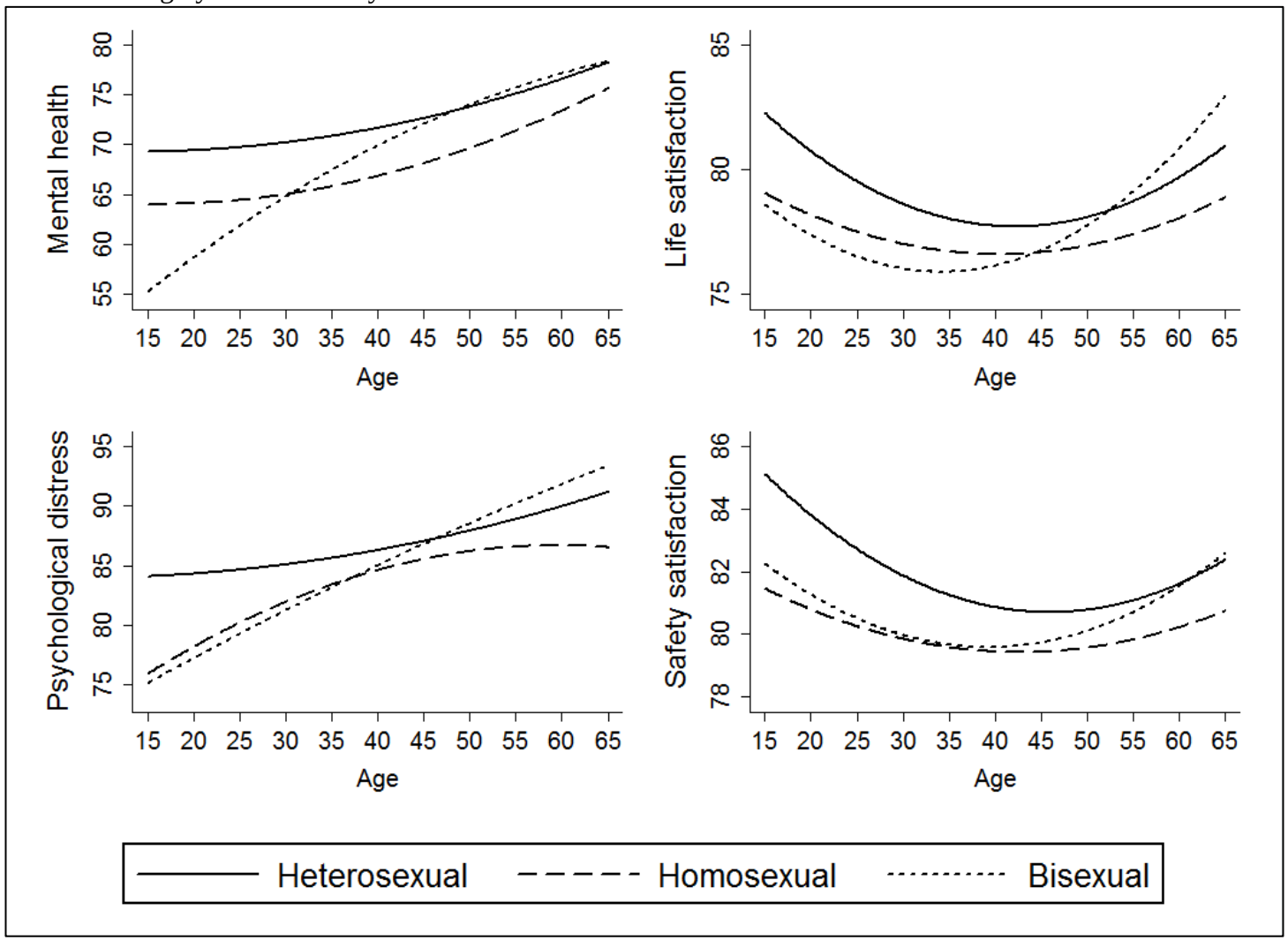
however three exceptions: the negative impacts of homosexual and bisexual sexual identities on mental health are significantly stronger for women than men ($p<0.05$), and the negative impact of homosexual sexual identity on psychological distress is significantly stronger for men than women ($p<0.01$).

Overall, results so far are clearly consistent with our first research hypothesis: individuals of sexual minorities in the Australian population have lower scores in all subjective wellbeing than individuals from the heterosexual majority.

5.2 Impacts of sexual identity on subjective wellbeing over the life course

The next set of analyses aims to test our second and third research hypotheses by exploring how differences in subjective wellbeing by sexual identity evolve over the life course. To achieve this, we estimate regression models analogous to those in Table 4, but which include interaction terms between age and age squared and the sexual identity dummy variables. Given the small sample sizes when sexual minority groupings are disaggregated by gender and the fact that gender differences within sexual identity groupings were generally not statistically significant in the previous models, we only do this for the short version of the sexual identity variable. Instead of presenting a complex and rather uninformative set of regression coefficients, we display the results by visual means.

Figure 1. Subjective wellbeing by sexual identity over the life course



Note: HILDA Survey data (2001-2012), except psychological distress (2007, 2009, 2011). Model controls as in Table 4. Predictions are for comparable hypothetical individuals who are female, partnered, childless, employed, have education qualifications lower than year 12 and no long-term health impairments, live in an urban area in 2012, and have scores equal to the sample means on household income (83,655), religiosity (4), and perceived social support (73.8).

Each of the four graphs in Figure 1 shows the predicted value for a given subjective wellbeing outcome over the life course for comparable heterosexual, gay/lesbian, and bisexual individuals. The graph in the top-left hand corner examines mental health. For all sexual identity groups, mental health tends to improve over the life course. The heterosexual sexual identity premium in mental health unveiled before is fairly constant over time with respect to gay/lesbian individuals, but diminishes relative to bisexual individuals. The graph on the bottom left-hand corner, in which psychological distress is the outcome of interest, displays a similar pattern, though differences between heterosexual and gay/lesbian people close slightly when individuals are in their 40s, before widening again when they enter their 50s. Life course trajectories in overall life satisfaction (top right-hand corner) and safety satisfaction (bottom right-hand corner) are very similar to each other. Unlike the previous two outcomes and consistent with the existing literature (e.g. Blanchflower and Oswald 2008), the relationship between age and these is U-shaped. Highest scores occur at young and old ages, and lowest scores during midlife. The differences by sexual identity are however very similar to those described earlier for the other outcomes: heterosexual individuals have substantially better outcomes than sexual minorities at young ages, with visible evidence of closing disparities over time – particularly for bisexual people.[5]

Results from these analyses are thus mostly consistent with our second research hypothesis: the negative effects of sexual minority status on subjective wellbeing in the Australian population appear to be largest amongst younger individuals, with the disparities closing over time.

6. Discussion and conclusion

In this paper we have used recent, nationally representative, high quality data from the Household, Income and Labour Dynamics in Australia Survey and random-effect panel regression models to estimate how sexual identity influences subjective wellbeing over the life course. This is simultaneously done for a nationally representative sample and in a longitudinal framework. Key findings indicate that men and women who identify as gay/lesbian or bisexual

[5] Differences in the ages at which the turning points for the concave functions for the different sexual identity groups occur are not statistically significant, with the exception of the difference between bisexual and heterosexual individuals in the life satisfaction graph.

have poorer outcomes concerning mental health, life satisfaction, psychological distress, and safety satisfaction than self-identified heterosexual individuals, *ceteris paribus*. There are no discernible differences on the impacts on subjective wellbeing of homosexual and bisexual sexual identities. These findings are generally consistent with results from previous non-representative, small, and/or cross-sectional studies and can for the first time be generalized to the Australian population. Additionally, it emerges from this research that the negative effects of sexual minority status on subjective wellbeing are largest during youth and fade over the life course, especially for individuals with bisexual sexual identities. The changing nature of the relationships between sexual identity and subjective wellbeing over the life cycle highlights the significance of adopting a life-course research approach (Umberson et al. 2014).

These results have important implications. First, our findings clearly position sexual identity as a socio-demographic trait of relevance for health researchers. When available, this information should be considered in models of subjective wellbeing, most importantly mental health. Second, the adversities associated with poor subjective wellbeing amongst the sexual minority population are unlikely to remain confined to the health realm. Some of the outcomes we consider, particularly mental health, are known to have substantial returns in important and varied life spheres such as family life, intimate relationships, the education system, and the labour market. Thus, it is likely that the poor subjective wellbeing of sexual minorities unveiled here plays a key role in perpetuating other undesirable outcomes, such as the high incidence documented for these population groups of substance abuse, poor physical health, homelessness, unrealized labour market potential, and poverty (Hatzenbuehler et al. 2014, Pachankis et al. 2014, Ueno 2010, Uhrig 2014). Given this, our findings clearly strengthen claims that protecting the rights and the realization of the human capabilities of individuals of sexual minorities should remain in the policy agenda, with the lack of population-level evidence on the issue being no longer an excuse to fail to do so (Gates 2013). Existing policies that outlaw direct labour market discrimination on the grounds of sexual identity in Australia are likely to be insufficient. Our findings are suggestive that a more global approach to prevent systematic, structural pressures on sexual minorities is needed to close sexual identity disparities in subjective wellbeing. Policies aimed at addressing the needs of teenagers and young adults, possibly through direct interventions in contexts to which they are most exposed, are urgently required (see Robinson et al. 2014 for an insightful discussion).

There are however limitations to our analyses which point towards avenues for further research. First, despite the large size and representativeness of the HILDA Survey sample, our results sometimes suffer from low statistical power. The number of individuals of sexual minorities, though substantially larger than in most other surveys and sufficient for parsimonious multivariate analysis, is rather scarce (216 gay/lesbian individuals and 205 bisexual individuals). Due to this, some of the observed effects were substantively large but statistically insignificant. It seems clear that new specifically-tailored survey instruments which over-sample sexual minorities are needed to gain a more nuanced, robust, and precise understanding of how sexual identity affects wellbeing and socio-economic outcomes, especially if differences across specific contexts (e.g. geographical locations) or population groups (e.g. age cohorts) are of interest.

Second, the HILDA Survey question on sexual identity, as those in most other surveys, oversimplifies sexuality by capturing only one of its dimensions. As argued by others, use of additional questions that tap other dimensions of this concept such as 'attraction' and 'behavior' would be more informative (Gates 2013, Pega et al. 2010, Uhrig 2014), and might result in evidence of different associations with subjective wellbeing.

Third, fully exploiting the longitudinal structure of the HILDA Survey data in estimation requires assuming that individuals have constant sexual identity over the observation window. Other recent studies have also done so due to data shortcomings (see e.g. Hatzenbuehler et al. 2010). As them, we acknowledge that this is a suboptimal solution, as research has documented that sexual identity is in fact fluid (Rosario et al. 2006, Savin-Williams and Ream 2007, Diamond 2008, Ott et al. 2011, Mock and Eibach 2012, Savin-Williams et al. 2012). However, there is general agreement in this literature that (i) sexual identity is fairly stable and less volatile than sexual behavior and attraction, (ii) most changes occur during adolescence and early adulthood, and (iii) the age of first adoption of a sexual minority identity (or 'coming out') is at a historical low. This is reassuring, given that all respondents in the HILDA Survey are 15 years of age or over, and a vast majority are well over that age (mean age in the sample is 44.37 years). Additionally, misclassification of sexual identity may just introduce random noise (resulting in higher standard errors). Only if misclassification is correlated with the outcome of interest would results be biased. The most plausible source for any such correlation is sexual minority individuals with poor subjective wellbeing refusing to reveal their 'true' identities and reporting being heterosexual instead. This scenario would not invalidate our findings and actually

strengthen our case, as it would imply that the disparities in subjective wellbeing by sexual identity are actually larger than we estimate. We also performed sensitivity analyses that include: (i) estimating cross-sectional models using only information in wave 12 of the HILDA Survey with no backwards extrapolation of sexual identity, and (ii) restricting analyses to individuals age 30 and over. These did not change the pattern of results. Inclusion of repeated reports of sexual orientation from the same respondents in panel studies such as the HILDA Survey or *Understanding Society* will open new analytical pathways in this respect.

Equality of opportunity is one of the fundamental principles in Australian society, as well as in other developed countries, and we have gone a long way in promoting the closing of gender, racial, and disability outcome gaps. There is however little awareness of how the life experiences of individuals of sexual minorities differ from those of the heterosexual majority, and little has be done to prevent this from leading to systematic exclusion and cycles of disadvantage. The findings of this research help us gain a better understanding of the factors that hinder equality of opportunity by sexual orientation and help devise strategies to optimally address these.

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8. Appendix

Table A1. Sample descriptive statistics

	Mean	sd
Mental health (0-100)	74.13	20.17
Life satisfaction (0-100)	79.52	14.26
Safety satisfaction (0-100)	81.81	15.80
Psychological distress (0-100)	86.35	15.14
Age in years	44.37	17.28
Partnered (Yes/No)	0.66	
Highest education qualification		
Below year 12	0.33	
Year 12	0.15	
Professional certificate	0.29	
Degree or higher	0.23	
Has children (Yes/No)	0.32	
Employment status		
Unemployed	0.03	
Inactive	0.31	
Employed	0.66	
Long-term health condition, disability or impairment (Yes/No)	0.25	
Religiosity (0-10)	3.92	3.32
Yearly disposable gross household income	83,655	63,328
Lives in an urban region (Yes/No)	0.84	
Perceived social support scale (0-100)	74.14	16.62
Wave of interview (1-12)	7.24	3.54
n (observations) = 110,802		

Note: HILDA Survey data (2001-2012), except psychological distress (2007, 2009, 2011). Statistics are based on the sample for the life satisfaction models.