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## A stone in the soup? Changes in sexual prejudice and essentialist beliefs among British students in a class on LGBT psychology

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Biological theories of sexual orientation, typically presented in human sexuality classes, are considered by many social psychologists to cause *reductions* in students' sexual prejudice. Yet when biological theories were *not* presented to 36 psychology students in a 10-week seminar on lesbian, gay, bisexual and transgender (LGBT) psychology, both sexual prejudice and two forms of essentialist thinking reduced significantly. Prejudice reduction was causally related to decreased essentialist belief in clear boundaries between sexual orientation categories but not to decreased belief in the immutability of sexual orientation categories. Students characterised belief in the fluidity of sexual orientation categories as enlightened and empowering in their own words. This cross-lagged study confirms earlier cross-sectional studies showing that sexual prejudice is causally related to 'natural kind' beliefs about sexual orientation. It further shows that the typical practice of teaching human sexuality courses from a biological perspective is not the cause of prejudice reduction in this educational context.

**Keywords:** teaching of psychology; essentialism; constructionism; modern prejudice; bisexuality; attribution theory

In one of the Grimm Brothers' tales, some travellers insist that they can make soup with just a stone. By convincing several passing villagers that a little garnish would *improve* the flavour of the soup, they procure a different ingredient from each. The travellers soon acquire a pot that is brimming with meat and vegetables from their curious hosts' larders. Even after the hearty broth is served and eaten, the villagers never suspect that it was their own generosity, and not the stone's purported magical effects that provided the meal's sustenance and flavour (McGovern, 1986). The stone soup story could be interpreted as a cautionary tale about the seductive power of *essentialist* thinking, the attribution of complex phenomena to the actions of unseen causal agents that give phenomena their character (Medin, 1989). The present research examines essentialist thinking about essentialism thinking itself. Specifically, the research concerns whether the theories of sexual orientation presented in college-level sexuality courses are an 'essential' cause of reductions in students' *sexual prejudice* towards lesbians and gay men (c.f., Herek, 2000, 2007).

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Three related findings suggest that biological essentialism might reduce sexual prejudice directly. First, participation in college-level sexuality courses has been often found to reduce heterosexual students' prejudice towards lesbians and gay men (Finken, 2002; King, Parisi, & O'Dwyer, 1993; Stevenson, 1988; Waterman, Reid, Garfield, & Hoy, 2001). Second, college-level curricula typically draw on textbooks that present evidence that sexual orientation is under biological control (Barker, 2007). Third, many surveys have found that heterosexual people who score lower on measures of sexual prejudice consider sexual orientation to be biologically determined or fixed, rather than learned or freely chosen (Aguero, Block, & Byrne, 1984; Eldridge, Mack, & Swank, 2006; Ernulf, Innala, & Whitam, 1989; Haslam & Levy, 2006; Haslam, Rothschild, & Ernst, 2002; Hegarty, 2002; Hegarty & Pratto, 2001; Herek & Capitanio, 1995; Horvath & Ryan, 2003; Jayaratne et al., 2006; Malcolmson, Christopher, Franzen, & Keyes, 2006; Sakalli, 2002; Whitley, 1990).<sup>1</sup> Jointly, these findings have suggested to some researchers that heterosexual students will become less prejudiced in these classes *because* of an essential effect of biological evidence on their prejudicial attitudes. For example, when Whitley (1990, p. 375) observed that heterosexual students who believed that being homosexual was a choice had the most negative attitudes towards lesbians and gay men he concluded that 'these findings may explain some of the success of college sexuality courses in ameliorating these attitudes'. Similarly, Altemeyer (2001, p. 69) reported that after presenting biological evidence about sexual orientation to his students that 'nearly everyone feels afterwards that gays cannot be morally faulted for their sexual orientation'. Beyond academia, journalists in the United States – but not their British counterparts – routinely construct biological evidence on sexual orientation as steps forward for lesbian and gay civil rights (Conrad & Markens, 2001).

However, alternative interpretations of these findings are also plausible. Prejudice appears particularly noxious when it is directed towards a stigmatised person who cannot control their possession of the stigmatised trait (Crandall & Eshleman, 2003; Rodin, Price, Sanchez, & McElligot, 1989). As a result, biological determinist theories of sexual orientation may *justify* pro-gay beliefs, and beliefs in environmental or choice determinants may justify prejudice (see also Hegarty, 2002). If this latter interpretation is correct, then there may be no 'essential' causal effect of teaching biological theories on prejudice. Although there may be many good *educational* reasons to teach students about those theories, biological essentialism may be as unnecessary to prejudice reduction in these classes as stone is to soup.

The present research addresses the relationship between essentialism and prejudice using a novel approach. In contrast to previous cross-sectional surveys, I observed changes in sexual prejudice and essentialist thinking using a cross-lagged design that examined the effects of a seminar on lesbian, gay, bisexual and transgender (LGBT) psychology. Students' attitudes and beliefs were assessed at the beginning and end of the semester, allowing several causal relationships between the two to be examined. In this seminar, biological theories about sexual orientation were *not* presented or discussed. This study sought to inform not only the social psychological question of the relationship between essentialist thinking and sexual prejudice, but also the applied question of how psychology courses might contribute best to psychology's historic mission in 'removing the stigma of mental illness that has long been associated with homosexual orientations' (Conger, 1975, p. 633). By way of introduction to this study, I review the theoretical framework that suggests why biological theories might be essential to prejudice reduction, and more recent research that casts doubt on that hypothesis.

### Do biological determinist theories reduce prejudice against lesbians and gay men?

With few exceptions (e.g., Hegarty, 2002; Hegarty & Pratto, 2001; Herek & Capitanio, 1995), social psychologists who have studied structural relationships between biological beliefs and attitudes to lesbians and gay men have tended to interpret those findings as evidence of *causal* effects of beliefs on attitudes. However, only rarely have authors conducted mediation analyses or verified structural equation models that support those interpretations (see Haslam & Levy, 2006; Horvath & Ryan, 2003 for notable exceptions). More often, Weiner's attributional theory of stigma (Weiner, 1993, 1995, 1996; Weiner, Perry, & Magnusson, 1988) has been invoked to interpret the causal relationships between attitudes and beliefs that could have led to such correlations. Attribution theory predicts that when a non-stigmatised person encounters a stigmatised individual or group that the non-stigmatised judge considers possible attributions for the existence of the stigma. When the stigma is attributed to factors beyond personal control, positive emotions, such as pity, result. However, when the stigma is attributed to factors under the control of the stigmatised target, negative emotions, such as anger, are elicited.

Biological theories of sexual orientation are often considered to be an exemplar of the attributional theory of stigma in action:

Gay groups have maintained that *sexual orientation* rather than *sexual preference* describes their state; given the present analysis, this should have positive benefits when considering reactions of others. Indeed, if homosexuality is found to have a genetic basis, as recent evidence indicates, then can (will) this still be considered a sin by church leaders and by the public, given that freedom of choice is a necessary precondition for the assignment of responsibility and subsequent anger? (Weiner, 1993, p. 960).

The attributional theory of stigma has been very well-received in social psychology. Major reviews of the research literature on stigma (Crocker, Major, & Steele, 1998, pp. 507–508; Kurzban & Leary, 2001, p. 194), explanation (Anderson, Krull, & Weiner, 1996, pp. 289–290), and stereotyping (Hilton & Von Hippel, 1996, p. 261) have echoed the view that correlations between attitudes to lesbians and gay men and beliefs about the origins of sexual orientation are explained by attribution theory's assumptions. In addition to sexual orientation stigma, the theory has been tested in domains such as obesity (Crandall, 1994), mental illness (Corrigan, 2000), and HIV/AIDS related stigma (Dooley, 1995). Indeed, Crandall (1994) reported direct evidence of the essential effect that attribution theory predicts. Students were randomly assigned to read that obesity was caused by biological factors or lifestyle, and reported more negative attitudes towards fat people in the first condition. Although Whitley's (1990) and Altemeyer's (2001) interpretations of reductions in sexual prejudice in human sexuality classes are consistent with attribution theory, three bodies of evidence cast doubt on that theory's capacity to account for change in sexual prejudice; research on prejudice and essentialist thinking, research on the effects of manipulating beliefs about sexual orientation, and research on changes in students' interests in human sexuality classes.

### Essentialist thinking and prejudice

The first body of evidence concerns the relationship between prejudice and essentialist thinking. Attributions of individuals' sexual orientations to unseen causes such as genes, brain structures, or hormones suggest that an individual's sexual orientation is fixed or *immutable*, and beyond personal choice. However, such biological essentialism

also suggests that sexual orientation categories have boundaries that are firmly based in biology and are *discrete*. More tolerant heterosexual people are more likely to endorse questionnaire items that express belief in the *immutability* of sexual orientation such as 'homosexuality is caused by biological factors such as genes and hormones'. However, more prejudiced heterosexual people are more likely to endorse items that express belief in the *discreteness* of sexual orientation categories such as 'male homosexuality is a category with clear and sharp boundaries: men are either homosexual or they are not' (Haslam & Levy, 2006; Haslam et al., 2002; Hegarty, 2002; Hegarty & Pratto, 2001). While essentialist beliefs often involve these two factors, Haslam and Levy (2006) described a third essentialist belief about sexual orientation; the belief that the categories of homosexuality and heterosexuality have *universal* validity across cultures and historical periods. While this belief is clearly implied by biological essentialist models, tolerant and prejudiced heterosexual people appear to be equally likely to express such a belief (Haslam & Levy, 2006). In sum, if biological evidence engenders essentialist thinking in human sexuality classes, then it likely affects beliefs that mitigate against blaming lesbians and gay men for their own sexualities, beliefs that cast lesbians and gay men as a discrete group who are organically distinct from heterosexuals, and beliefs that have no clear relationship to sexual prejudice.

Although belief in the biological determination of sexual orientation is correlated with tolerance towards lesbians and gay men, beliefs in biological determination are also correlated with prejudice and stereotyping of other minority groups (c.f., Bastian & Haslam, 2006; Keller, 2005; Martin & Parker, 1995; Morton, Postmes, Haslam, & Hornsey, 2009; Prentice & Miller, 2007; Williams & Eberhardt, 2008; Yzerbyt, Rocher, & Schadron, 1997). This pattern of results has led researchers to wonder if sexual prejudice is a 'special case' in this literature (e.g., D.J. Bem, 1998; Haslam et al., 2002; Jayaratne et al., 2006). However, as Prentice and Miller (2007) note, studies of essentialism and sexual prejudice in the domain of sexual orientation typically examine the belief in the idea that sexual orientation is *itself* an 'essential' reality, whereas discussions of essentialism and ethnic prejudice typically refer to belief in the reality of stereotypes linking category membership with other traits. Heterosexual people who consider sexual orientation to be genetic are often less prejudiced. However, heterosexual people who consider that there is a gene that ties homosexuality to disease might not be. Ironically, genetic research on sexual orientation that has been widely announced as pro-gay research also aimed to determine a genetic link between homosexuality and alcoholism (c.f., Hamer & Copeland, 1994). Because of these implications of biological determinism, it is important to consider whether attribution theory's claim that attributions affect attitudes has empirical support.

### Effects of attributional manipulations on prejudice

If the attributional theory of stigma were right, then presenting biological evidence that demonstrates the immutability of sexual orientation ought to reduce sexual prejudice with some consistency, just as Crandall (1994) has shown such evidence to do in the domain of fat prejudice. Published experimental findings are not consistent with this conclusion. In one early study, Piskur and Degelman (1992) found that biological information reduced women's, but not men's, anti-lesbian/gay attitudes. Falomir-Pichastor and Mugny (2009) more recently found that biological information reduced sexual prejudice in a study with male participants. However, in this study prejudice reduction was mediated by a feeling that gay men were distinctly different from heterosexual men, not by changes

in causal beliefs. Oldham and Kasser's (1999) findings cast further doubt on the claim that biological evidence reduces prejudice via changes in causal thinking. Students who remembered the biological evidence presented in their study became *more* prejudiced, whereas students who forgot it became less prejudiced. Hegarty and Golden (2008) presented evidence that confirmed or refuted biological theories of several stigmatised traits, including homosexuality. No change was observed on standardised attitude measures, personal stereotype measures, or feeling thermometers, but more prejudiced participants had more spontaneous attributional thoughts overall. Pratarelli and Donaldson (1997) similarly found no effects of presenting biological information on students' attitudes. Finally, Boysen and Vogel (2007) observed biased assimilation and attitude polarisation effects (c.f., Lord, Ross, & Lepper, 1979; Miller, McHoskey, Bane, & Dowd, 1993). Students with initially positive attitudes towards homosexuality rated a biological article as more legitimate than students with initially negative attitudes. Students with initially positive attitudes reported that their attitudes had become more positive, and those with negative attitudes reported that their attitudes had become more negative.

These diverse results do not support the view that attitudes change as a direct consequence of exposure to biological arguments. Jointly they suggest instead that people actively interpret and debate the meaning of evidence about the determinants of sexual orientation to a greater extent than attribution theory allows (see also Potter & Edwards, 1993). Sheldon, Pfeffer, Jayaratne, Feldbaum, and Petty's (2007) qualitative findings further support this view. These authors asked members of the public to consider positive and negative implications of new genetic evidence about sexual orientation. In response to each question some people called to mind clearly pro-gay implications whereas others considered clearly anti-gay implications of such discoveries. In other words, people were able to actively construct a much wider set of relationships between biological evidence, sexual prejudice, and discriminatory policies and practices than attribution theory considers.

### **Students' interests in biological essentialist topics**

A third body of evidence that challenges attribution theory is most relevant to the current educational study. If sexual prejudice reduces in human sexuality classrooms because of the effects of biological theories, then one might expect students to become more interested in such theories as their prejudice decreases. Waterman et al. (2001) assessed students' prejudice and their interest in 26 topics at the beginning and end of a course titled 'The Psychology of Homosexuality'. Prejudice reduced among these largely heterosexual students. At the start of the semester, students were most interested in two topics: 'theories of why people are gay' and 'biological differences between homosexuals and heterosexuals'. At the end of the course these interests were ranked only 2nd and 10th respectively among their interests. By the end of the course, students were also less interested in ways of detecting a person's sexual orientation, and had become most interested in 'supporting someone coming out'. By showing that prejudice reduction can co-occur with a reduction in interest in biological determinist questions, this study casts further doubt on the possibility that biological determinist thinking supports prejudice reduction directly.

### **Androcentrism**

Biological models of sexuality, which suggest that sexual orientation is a trait that emerges early in the lifespan and that people's sexualities rarely change after they 'come out' as



lesbian or gay, have a further conceptual and educational weakness; they describe young women's sexualities badly. Longitudinal studies of sexual minority women (e.g., Diamond, 2000, 2008), lesbians' accounts of their sexual identities (Kitzinger & Wilkinson, 1995), and surveys of bisexual women (Rust, 1993) all show that essentialist models of sexual orientation fail to account for meaningful change in adult women's sexualities (see also Diamond, 2003; Fausto-Sterling, 2000; Mustanski, Chivers, & Bailey, 2002; Peplau et al., 1998; Veniegas & Conley, 2000). In other words, essentialist theories of sexual orientation are 'androcentric'; they conflate men's sexuality with human sexuality to the disadvantage of women (S.L. Bem, 1993; De Beauvoir, 1949). The failure of biological essentialist theories to account for women's sexualities is particularly relevant to the question of their presentation in psychology classrooms. In many disciplines, including psychology, male students are a minority (Olos & Hoff, 2006; Ostertag & McNamara, 1991), but female students are more likely to find that members of their gender group are underrepresented in their textbooks (Peterson & Kroner, 1992; Santos de Barona & Reid, 1992). The prominence of biological theories in the human sexuality curriculum (Barker, 2007) may contribute to larger problems with androcentrism in such disciplines as psychology wherein women, more than men, find themselves misrecognised by the model of personhood presented by psychological research (c.f., S.L. Bem, 1993; Lee & Crawford, 2007).

### **The current study**

The current study was conducted in the context of a seminar class titled 'Lesbian, Gay, Bisexual, and Transgender (LGBT) Psychology' in the South of England. The class was taught by the author of this paper, who is a gay man, and who came out to his students early in the semester in each year that the course was offered. As in Waterman et al.'s (2001) Psychology of Homosexuality course, most of the students enrolled in the LGBT psychology course studied here were heterosexual-identified. Whereas Waterman et al. (2001) examined only changes in students' interests and prejudice, I also examined changes in students' essentialist beliefs and sexual attraction.

Most studies cited above were conducted in the United States. Several cultural differences between the United States and the United Kingdom are relevant to the current study. Historically and currently, British people are far more likely to endorse the view that homosexuality is a justifiable lifestyle than their contemporaries in the United States (European and World Values Surveys, 2006). In Britain, sexual minorities enjoy protection of their civil and human rights that are enviable from a US perspective. These rights include protection of lesbians, gay men, and bisexual women and men from workplace discrimination, the right of same-sex couples to adopt children and to form civil partnerships, and the right of lesbians, gay men, and bisexuals to serve in their country's armed forces. Indeed, the legal and social landscape that sexual minorities inhabit has led some sociologists to describe contemporary Britain as 'the world we have won' (Weeks, 2007).

Biological research on sexual orientation has had a looser relationship to the winning of this world than attribution theory would predict. Discussions of civil rights in the United Kingdom are framed more by discussions of the common claims to citizenship of people of all sexualities rather than the biological basis of sexual orientation (Richardson, 2000); biological studies of sexual orientation are reported as supporting much more ambivalent politics in the British news than in the American news (Conrad & Merckens, 2001), and the field of LGBT psychology itself has developed along comparatively more 'social constructionist' lines in Britain in comparison with more positivist-empiricist research in the United States (see Kitzinger & Coyle, 2002 for discussion).

Consistent with this intellectual and political climate, this course adopted a more social constructionist orientation than many human sexuality courses in the United States. Readings introduced students early on to the view that the experiences of sexual and gender minorities provided a basis for theory (e.g., Brown, 1989; Hale, n.d.), whereas psychological science about sexual and gender minorities was often heterosexist (Herek, Kimmel, Amaro, & Melton, 1991) and often shaped by politics and history (Kitzinger, 1997; Minton, 1997). Nature-nurture debates about sexual orientation were represented on the reading list primarily through a discursive psychology paper on biology in the first year the class was taught (Hegarty, 1997), and a paper integrating biological and constructionist approaches to the development of sexual orientation in the second year that the class was taught (Hammack, 2005). As such, the LGBT psychology course allowed an opportunity to assess how sexual prejudice reduction proceeds when the volume has been turned down, rather than up, on biological theories about sexual orientation.

Following Waterman et al. (2001), students' *interests* in LGBT psychology topics were assessed at the beginning and end of the course. So too were their essentialist beliefs, using Haslam and Levy's (2006) measures. Finally, modern prejudice towards lesbians and gay men was assessed using Morrison and Morrison's (2002) measure of modern homonegativity, which measures opposition to lesbian and gay movements for civil rights and public visibility, rather than negative reactions towards lesbians and gay men as a distinct group. As such, the current study is the first to examine concurrent changes in essentialist thinking, sexual prejudice, and academic interests in a human sexuality course. Can the soup of prejudice be reduced down without stones chipped from the bedrock of biological evidence?

## Method

### *Participants*

Female ( $n = 32$ ) and male ( $n = 5$ ) students who participated in the seminar in either 2008 ( $n = 28$ ) or 2009 ( $n = 9$ ) completed materials at both its beginning and end ( $M$  age = 21.4 years, range = 20–32 years). A further four enrolled students were unavailable at the end of the semester because of illness and lack of attendance. These students described their nationalities as British ( $n = 34$ ), Italian ( $n = 1$ ), South African ( $n = 1$ ), or not at all ( $n = 1$ ), and their ethnicities as White ( $n = 31$ ), Black British ( $n = 1$ ), Black Caribbean ( $n = 1$ ), Indian ( $n = 1$ ), African ( $n = 1$ ), or not at all ( $n = 2$ ). At the beginning of the course, students identified as heterosexual/straight ( $n = 30$ ), bisexual ( $n = 4$ ), lesbian/gay ( $n = 1$ ), or did not identify a label ( $n = 2$ ). By the end of the course, two previously heterosexual-identified women identified as bisexual.

### *Materials*

#### *LGBT psychology course content*

LGBT psychology was offered as an optional final-year seminar to students taking undergraduate degrees in Psychology and in Applied Psychology and Sociology. Topics included methodology in LGBT psychology, queer theory, mental health (including debates about the politics of diagnosing Gender Identity Disorder), models of identity development, prejudice, family psychology (including parenting and relationship issues), health psychology (including HIV/AIDS), social constructionist theory and method, and bisexual, transgender and intersex social movements. Students were assessed by short essays addressing specific questions by drawing on readings and a longer term paper based on independent research.



*Pre-course questionnaire*

The pre-course questionnaire was three pages long. Following Waterman et al. (2001), the first page asked students to rate their interest in twenty topics using 4-point scales ranging from 1 'not at all interested' to 4 'very interested.' The 20 topics were *gay men's psychology*, *lesbian women's psychology*, *bisexual men's psychology*, *bisexual women's psychology*, *transmen's psychology*, *transwomen's psychology*, *heterosexual men's psychology*, *heterosexual women's psychology*, *theories about the origins of sexual orientation*, *biological differences between homosexuals and heterosexuals*, *LGBT history*, *queer theory*, *mental health issues among LGBT groups*, *LGBT-affirmative psychotherapies*, *research methods in LGBT psychology*, *HIV/AIDS*, *prejudice and discrimination against LGBT people*, *LGBT youth issues*, *LGBT parents*, and *same-sex parents*. Except for *theories about the origins of sexual orientation*, and *biological differences between homosexuals and heterosexuals*, all of these topics were substantially and repeatedly addressed by several assigned readings in the LGBT Psychology course.

The second page presented Morrison and Morrison's (2002) 12-item scale of modern prejudice towards lesbians and gay men. Typical items are 'gay men and lesbians have become far too confrontational in their demands for equal rights' and 'gay men and lesbians who are "out of the closet" should be admired for their courage' (reverse coded). All statements were presented as 7-point Likert items.

The third page listed fourteen items assessing *essentialist beliefs* that were adapted from Haslam and Levy (2006). These authors asked seven items about homosexuals. Seven alternate framings of these same items that focused attention on heterosexuals were added here. Some of Haslam and Levy's items were simplified, such that items were presented as they appear in Table 1 with the defining difference between frames presented in square brackets.

Table 1. Mean of student' essentialist beliefs pre- and post-course.

Item	Pre-course	Post-course	<i>t</i> (df = 36)	<i>p</i>
[Homosexuality/heterosexuality] is caused by biological factors such as genes and hormones	4.07 (1.58)	3.31 (1.56)	3.63	.001
A [homosexual/heterosexual] person can become [heterosexual/homosexual]	3.54 (1.45)	3.63 (1.85)	-.18	n.s.
Whether a person is [homosexual/heterosexual] is pretty much set early on in childhood	4.16 (1.44)	4.26 (1.62)	-.33	n.s.
[Homosexuality/heterosexuality] is a category with clear and sharp boundaries	2.47 (1.73)	1.73 (1.09)	2.89	<.01
[Homosexuals/heterosexuals] have 'defining features' without which they would not be [homosexual/heterosexual]	2.81 (1.49)	2.28 (1.23)	2.12	<.05
[Homosexuality/heterosexuality] has probably existed throughout human history	6.67 (.68)	6.51 (1.22)	1.09	n.s.
[Homosexuality/heterosexuality] only exists in certain cultures	1.84 (1.20)	2.31 (1.94)	-1.60	n.s.

Standard deviations in parentheses.

Finally, open-ended items asked students to report their gender, nationality, ethnicity, and age. Sexual orientation was assessed with the open-ended item 'What term would you use to describe your sexuality?' Participants also reported their attraction to 'people of the same gender as me' and 'people of the opposite gender to me' on Likert scales anchored at 1 'not at all' and 7 'strongly'. The final questions asked participants to write down their birthday and mother's maiden name to allow questionnaires to be matched across waves while assuring anonymity.

#### *Post-course questionnaire*

The questionnaires distributed at the beginning and end of the course were identical except for an open-ended item presented after the essentialism items on the post-course questionnaire:

In your own words, please describe how you think your own attitudes and beliefs have changed as a result of participating in this course?

This item was followed by several blank lines.

#### *Procedure*

Questionnaires were distributed at the start of the first and last session of the course. The study was introduced at the start of the first class session, and described as one that concerned how people change the way they think and feel as a result of taking part in a class on LGBT psychology. After the post-class questionnaires were collected, the instructor and students discussed research on changes in attitudes, beliefs, and interests that resulted from participation in sexuality courses in greater depth.

### **Results**

Analysis of the results focused on changes in students' interests, prejudice, and beliefs from the beginning to the end of the course (see Table 1).

#### *Students' interests*

Students' average level of interest in the 20 topics was above the midpoint of 2.5 on the 4-point scale at both the beginning and the end of the course ( $M_s = 3.16, 2.97$ , one-sample  $t(36) = 11.36, 6.34$  respectively, both  $p < .001$ ). Students reported significantly less overall interest in these topics at the end than at the beginning of the course, two-sample  $t(36) = 2.57, p < .05$ . Item-by-item analysis showed significant decline from the beginning to the end of the course in four topic areas: *gay men* ( $M_s = 3.36, 3.11$  respectively),  $t(36) = 2.05, p < .05$ , *theories about the origins of sexual orientation* ( $M_s = 3.69, 3.09$  respectively),  $t(36) = 4.38, p < .001$ , *biological differences* ( $M_s = 3.02, 2.36$  respectively),  $t(36) = 4.47, p < .001$ , and *prejudice*, ( $M_s = 3.69, 3.39$  respectively),  $t(36) = 2.45, p < .05$ . As in Waterman et al. (2001), students became less interested in biological essentialist questions during this course. When student's overall interest was calculated with interests in *theories about the origins of sexual orientation* and *biological differences* excluded, the decline in interest was no longer significant  $M_s = 3.14, 3.01$  respectively),  $t(36) = 1.84, p = .07$ .

#### *Modern prejudice*

Students' modern prejudice scores were examined next. The scale was reliable (Cronbach's  $\alpha = .69, .86$  at the beginning and the end of the course respectively), and modern prejudice

scores are reported as averages of all items such that higher scores indicate higher prejudice. Unsurprisingly, these students, who *elected* to take the LGBT psychology course, scored significantly below the mid-point of the scale at the beginning and end of the course,  $t(36) = 2.41, 2.12$  respectively, both  $p < .001$ . Consistent with past studies of sexuality education, sexual prejudice reduced significantly across the duration of the course,  $t(36) = 2.73, p < .01$ . At the start of the course, students' attitudes were unrelated to their overall interest in the topics,  $r(36) = -.08$  n.s. By the end of the course, less-prejudiced students expressed consistently more interest in the topics,  $r(36) = -.50, p < .001$ .

### ***Essentialist beliefs***

The questionnaires used two question response frames for each of seven essentialist beliefs. In each case, responses to the two different framings of each item were significantly correlated, average  $r(36) = .84, .86$  pre- and post-course respectively, range = .63–.95 and .76–.96 respectively, all  $p < .001$ . Consequently, responses were averaged across each frame. Essentialist beliefs both pre- and post-course are shown in Table 1. All significant changes in essentialist beliefs were *reductions* in essentialist thinking. Significant reductions were observed with regard to the belief that sexual orientation is caused by biological factors, the belief that sexual orientation categories have clear and sharp boundaries, and the belief that homosexual and heterosexual people have defining features.

Relationships between essentialist beliefs and prejudice were assessed next. At the start of the course, more prejudiced students believed that sexual orientations could change,  $r(36) = .44, p < .01$ , and that sexual orientation categories had clear and sharp boundaries,  $r(36) = .34, p < .05$ . Otherwise prejudice and essentialist beliefs were unrelated, all  $|r| < .13$ , all  $p > .45$ . By the semester's end, more prejudiced students continued to believe that sexual orientation categories had clear boundaries,  $r(36) = .44, p < .01$ , but they no longer believed that sexual orientations could be changed,  $r(36) = -.06$ , n.s., and had come to believe that sexual orientation categories had defining features,  $r(36) = .37, p < .05$ . All other correlations were non-significant.

### ***Sexual attraction***

Finally, students' same- and opposite-gender attraction was assessed. Attraction to same-gender people increased significantly between the course's beginning and its end ( $M_s = 2.84, 3.68$  respectively),  $t(36) = -2.13, p < .05$ , but attraction to opposite-gender people remained unchanged ( $M_s = 5.78, 5.81$  respectively),  $t < 1$ . Self-reported same- and opposite-gender attraction were negatively correlated. This relationship was not significant at the beginning of the course,  $r(36) = -.24, p = .15$ , but was significant at the end,  $r(36) = -.64, p < .001$ .

In short, changes over the duration of the course were observed in seven domains. First, students became less prejudiced. Second and third, students became less interested in biological theories of sexual orientation and theories of the origins of sexual orientation. Three further changes concerned essentialist beliefs. Students came to believe less that sexual orientation categories were caused by the effects of genes and hormones, had clear boundaries, or had defining features. Finally, same-sex attraction increased overall.<sup>2</sup> Change scores for each of these seven variables were calculated and correlations between them were calculated. Only one clearly significant correlation was observed. Students whose prejudice reduced the most also showed the greatest reduction in the belief that sexual orientation categories had clear boundaries,  $r(36) = .40, p < .02$ . Three further marginally

significant correlations were observed. Students whose belief in the biological basis of sexual orientation reduced the most also showed the most reduction in belief in defining features of sexual orientation categories,  $r(36) = .30, p = .07$ , and the greatest reduction in interest in theories of the origins of sexual orientation categories,  $r(36) = .33, p = .052$ . Ironically, students whose belief in the clear boundaries between sexual orientation categories reduced the most showed the *least* increase in same-sex attraction,  $r(36) = .28, p = .09$ . All other correlations were not significant, all  $|r| < .25$ , all  $p > .15$ . These results suggest that reduction in essentialist beliefs was causally related to prejudice reduction and not attributable to students' own experience of their sexualities as flexible.

Causal relationships between changes in modern prejudice and belief in the boundedness of sexual orientation categories were investigated next. First I examined whether changes in students' essentialist thinking during the course were predictive of their prejudice at the end of the course. Changes in participants' belief in category boundaries and pre-class prejudice scores were centred on zero. These two scores were multiplied to create an interaction term. Post-class prejudice scores were then predicted from pre-class prejudice scores, changes in beliefs about category boundaries, and the interaction term. The overall model was significant and explained much of the variance in post-course prejudice,  $F(3, 33) = 9.86, p < .001$ , adjusted  $R^2 = .425$ . Unique variance in post-class prejudice was predicted by pre-class prejudice,  $\beta = .588, p < .001$ , and change in essentialist beliefs,  $\beta = .365, p < .05$ , but not by their interaction,  $\beta = .161, n.s.$

Next, I conducted a similar analysis to examine whether prejudice reduction predicted changes in essentialist thinking. Here, I centred prejudice change scores and pre-class essentialist belief scores on zero, and calculated their product to create an interaction term. In this model, post-class belief in category boundaries served as the dependent variable. Pre-class belief in category boundaries, prejudice change scores, and their interaction were entered as predictors. Again, the overall model was significant and explained much of the variance in post-course prejudice,  $F(3, 33) = 5.80, p < .01$ , Adjusted  $R^2 = .286$ . Unique variance in post-class essentialism was predicted by pre-class essentialism,  $\beta = .468, p < .01$ , and change in prejudice,  $\beta = .342, p < .05$ , but not their interaction,  $\beta = .262, n.s.$  In conclusion, although a causal relationship existed between reduction in modern prejudice and reduction in beliefs in the boundedness of sexual orientation categories, the direction of causal influence remained unclear.

### ***Post-class open-ended responses***

Eleven students (36%) spontaneously mentioned changes to their essentialist beliefs when responding to the open-ended item on the post-class questionnaire. I quote their response below because rating scales can sometimes suppress variability in causal attributions about complex social and political realities (Potter & Edwards, 1993). These students described the changes in their belief were constructed as enlightened, open-minded, and empowering as follows:

Through this class I have been able to see things are not as clear as they are made out to be in culture i.e. clear boundaries of heterosexual and homosexual. (Heterosexual-identified woman)

I have become more aware of how blurred the boundaries between homosexuality and heterosexuality are, previously I would have made assumptions when people identify as on (sic) or the other, now I think I am more open-minded. (Gay-identified man)

I used to believe than people thought of bisexuality as a transitional period. It's good to know that people recognise sexuality as continuous and not simply within the domains of categorisation. (Heterosexual-identified female student)

It has made me think of sex, gender and sexual orientation as much more fluid concepts and very much open to a person's interpretations. (Heterosexual-identified male student)

Students who described their beliefs about the discreteness of sexual orientation categories as self-relevant tended also to identify as bisexual:

My attitudes and beliefs haven't really changed too much. As a bisexual man I feel much of the experiences and topics reviewed have been experienced by myself and my standpoint on issues have therefore stayed very similar. (Bisexual-identified male student)

It has helped me feel more comfortable and confident in my bisexuality as before I was constantly hearing that I HAD to be one or the other, and has given me tools to argue back. (Bisexual-identified female student)

Only one student answered the open-ended item by affirming an essentialist view of sexual identity:

Greater understanding of genetic effects on environment that can alter a child's orientation in play and later gender to which they are sexually attracted – strongly affirmed that being LGBT is NOT a choice. (Heterosexual-identified female student)

## **Discussion**

Unsurprisingly sexual prejudice reduced among the students in this LGBT Psychology course. Consistent with studies of essentialism and prejudice (Keller, 2005; Prentice & Miller, 2007), but inconsistent with attribution theory (e.g., Weiner, 1993; Whitley, 1990), the students simultaneously became less essentialist in their beliefs and interests. Indeed, prejudice reduction was causally related to reduction in the essentialist belief that sexual orientation categories were clearly bounded, although the direction of causality between changes in essentialist beliefs and changes in prejudice was unclear.

Causally related changes in sexual prejudice and essentialist beliefs have not been demonstrated before in a cross-lagged study design. As such, the current findings support the interpretation of cross-sectional studies that correlations between sexual prejudice and beliefs in the boundedness of sexual orientation categories are causally related (Haslam & Levy, 2006; Haslam et al., 2002; Hegarty, 2002; Hegarty & Pratto, 2001). The findings also reinforce the position that sexual prejudice is not an anomaly in the wider literature on essentialist thinking and prejudice (Prentice & Miller, 2007). Sexual prejudice is akin to sexism, racism, and other forms of prejudice in that it is most extreme when the less powerful minority group in question is deemed to be fundamentally 'different' from the more powerful majority group in some distinct way (c.f., Bastian & Haslam, 2006; Keller, 2005; Martin & Parker, 1995; Morton et al., 2009; Prentice & Miller, 2007; Yzerbyt et al., 1997).

Along with the experimental research reviewed above (e.g., Boysen & Vogel, 2007; Falomir-Pichastor & Mugny, 2009; Hegarty & Golden, 2008; Oldham & Kasser, 1999; Piskur & Degelman, 1992; Pratarelli & Donaldson, 1997) this study demonstrates that prejudice is not simply or directly reduced as a consequence of learning that sexual orientation is biologically determined or immutable. Students have become less prejudiced in sexuality classes both when they become less interested in essentialism (Waterman et al., 2001), and

when essentialism is actively promoted as part of a gay-affirmative strategy (Altemeyer, 2001). In both cases, and indeed in the current study, instructors might be reinforcing ideas as to whether essentialist or anti-essentialist beliefs are lesbian/gay-affirmative or not, and hence can be used as strategic arguments in sexual politics or not. However, there may be no 'essential' effect of biological evidence on students' attitudes that is mediated by change in students' attributional thinking. Consistent with the justification-suppression theory of prejudice (Crandall & Eshleman, 2003), attributions of sexual orientation to biology or choice may actually be *rationalisations* of positive attitudes to lesbians and gay men, which are formed in these classes (see also Hegarty, 2002; Hegarty & Golden, 2008).

If neither essentialist nor constructionist theories of sexual orientation are non-essential stones in the soup of attitude change in human sexuality classes, then what other experiences might provide the material 'flavour' of prejudice reduction in human sexuality classes? Sexuality classes often provide heterosexual students with personal contact with lesbians and gay men (McCord & Herzog, 1991), and intergroup contact reduces sexual prejudice more than any other form of prejudice (Pettigrew & Tropp, 2006). Classroom and homework exercises such as writing coming out letters (Hubbard & DeWelde, 2003), role playing (Battle, 2004; Hillman & Martin, 2002), shadowing lesbian/gay people (Moradi, 2004), and learning to challenge expressed prejudice (Plous, 2000) may additionally create empathy that makes the experiences of lesbians and gay men appear less alien to heterosexual students (c.f., Stephan & Finlay, 1999). Such exercises, which allow students to *feel* prejudice, directly or analogously, may also undermine modern prejudicial ideologies, which assumes that prejudice does not exist at all (McConahay & Hough, 1976; Morrison & Morrison, 2002; Swim, Aikin, Hall, & Hunter, 1995). Instead of assuming that biological determinist theories play a causal role in observed changes in prejudice, future research ought to document such direct effects, while carefully discounting the effects of other ongoing interventions that are known to reduce prejudice.

In addition to the questionable status of biological theories as tools for changing prejudiced attitudes towards sexual minorities, teaching such theories might also entrench androcentrism. As the students studied here demonstrated, same- and opposite-sex attraction vary more in their relationship to each other, and young women change the sexual orientation category with which they identify more often than essentialist models of sexuality allow (c.f., Diamond, 2003, 2008). As the quotes from participants in this study further illustrate, and as psychology textbooks sometimes obscure (Barker, 2007; Hogben & Waterman, 1997), some male and female students identify as bisexual. Reducing reliance on such textbooks would both counter the problem of androcentrism in the psychology of sexual minorities (Lee & Crawford, 2007), and recognise the experiences of students who identify as bisexual, queer (Minton, 1997), and 'mostly straight' (Thompson & Morgan Thompson, 2008).

However, in drawing conclusions from this study, five caveats ought to be borne in mind. First, the questionnaires used may not have captured the complexity of students' essentialist thinking, as more detailed qualitative studies in this area have done (e.g., Sheldon et al., 2007; Whisman, 1996). Second, this British study was conducted in a legal and social context more supportive of equality for sexual minorities than the United States, where most previous research on essentialism and prejudice has been conducted (although see Falomir-Pichastor & Mugny, 2009; Hegarty, 2002; Hegarty & Golden, 2008; Morton & Postmes, 2009 for exceptions). Third, the students were a self-selecting group who were comparatively liberal in their views. As such, the conclusions of this research should not be generalised automatically to all students, but interpreted as an 'existence proof' of the claim that students can become less prejudiced while simultaneously becoming less



essentialist in their thinking. Clearly, this study needs to be replicated in larger classes, with students whose initial attitudes towards lesbians and gay men vary more widely. Fourth, the seminar format allowed for sustained discussion – and likely opportunities for meaningful intergroup contact. Larger lecture classes may not afford such experiences. Finally, this study was not a controlled experiment, and threats to its internal validity remain. Specifically, I cannot estimate the degree to which the students' maturation, ongoing historical events, or other factors unrelated to the seminar course contributed to the significant changes observed here (see Cook & Campbell, 1979).

Nonetheless, as the most detailed study of changes in students' sexual prejudice and essentialist beliefs in the literature, this study ought to shift the burden of proof with regard to the interpretation of sexual prejudice reduction in human sexuality classes. In the absence of *any* studies that show clearly that presenting biological determinist arguments reduce sexual prejudice, whether in well-controlled short experiments, or cross-lagged design studies of larger interventions, it is prudent to conclude that prejudice reduction is not one of the good educational reasons to teach students about these theories. This is not a conclusion that would readily be reached by a reading of major research reviews in social psychology (Anderson et al., 1996; Crocker et al., 1998; Hilton & Von Hippel, 1996; Kurzban & Leary, 2001; Weiner, 1993, 1996), by the conclusions researchers have drawn from their correlational studies (e.g., Whitley, 1990), or from popular discourse on the political meaning of biological studies of human sexual orientation (Conrad & Merkens, 2001). Contrary to all of these, it appears that soup can, at least sometimes, be successfully cooked without stone.

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### Notes

1. In these studies, respondents are presumed to be heterosexual. However, methods for determining participants' sexual orientation vary across studies, and are sometimes absent.
2. All statistical tests leading these conclusions were re-conducted including only the 30 students who identified as heterosexual at the beginning of the course. Identical statistical conclusions were reached.

### Notes on contributor

Peter Hegarty has published over 70 articles and book chapters on sexuality, gender, social psychology, and the history of psychology and is completing his first book (*Matters Between Men: Alfred Kinsey, Lewis Terman, and the Debate that Made Sex Unsmart*, Chicago, forthcoming). He has taught undergraduate classes on LGBT Psychology since 1997 at four different universities in both the United States and the United Kingdom. He won the University of Surrey's Prize for Learning and Teaching in 2006, and co-convenes the University of Michigan's Summer Institute for Lesbian, Gay, Bisexual, and Transgender Psychology.

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