Love is heterosexual-by-default: Cultural heterosexism in default prototypes of romantic love

Sapphira R. Thorne [ID], Peter Hegarty [ID] and Erica G. Hepper [ID]

School of Psychology, University of Surrey, Guildford, UK

Cultural heterosexist ideologies assume heterosexuality to be the default norm. Four studies investigated when concepts of romantic love are heterosexual-by-default ($N = 685$). In Studies 1–2, participants generated features of romantic love, in general (i.e., the default prototype) or among one of three sexual orientation-specific couples (lesbian, gay, or heterosexual). Heterosexual-identified participants' default prototypes were more similar to heterosexual than same-gender prototypes (Study 1). Lesbian- and gay-identified participants' default prototypes were more similar to both heterosexual and gay male than lesbian prototypes, whereas bisexual-identified participants' sexual orientation-specific prototypes were equivalently similar to the default (Study 2). However, heterosexual-identified participants rated presented features of love similarly across sexual orientation-specific conditions (Study 3). In a timed feature-verification task (Study 4), participants categorized fewer *peripheral* features of romantic love as relevant to same-gender than mixed-gender couples. Activating sexual orientation-specific representations affected subsequent default concepts of romantic love. We discuss implications for heterosexism theories and intervention.

A man and his son were away for a trip. They were driving along the highway when they had a terrible accident. The man was killed outright but the son was alive, although badly injured. The son was rushed to the hospital and was to have an emergency operation. On entering the operating theater, the surgeon looked at the boy, and said, 'I can't do this operation. This boy is my son.'

When presented with this 'surgeon riddle,' only half of participants correctly guess that the surgeon is the boy's mother (Reynolds, Garnham, & Oakhill, 2006, see Hegarty, 2017, Studies 3–4 for recent replication). This classic riddle can confuse people, who automatically construct categories as being populated by *prototypical* members of those categories by *default* (Bodenhausen & Peery, 2009; Rosch, 1975). People often construct concepts in ways that assume certain characteristics (e.g., White, male, heterosexual) that go without saying (Bodenhausen & Peery, 2009; Hegarty, 2017). The surgeon riddle tricks readers who automatically construct a representation of 'the surgeon' as a man in the final

Correspondence should be addressed to Sapphira R. Thorne, School of Psychology, Cardiff University, Tower Building, 70 Park Place, Cardiff, CF10 3AT, UK (Tel.: +44-29-2087 0475; email: ThorneS5@Cardiff.ac.uk).

sentence, only to find that at the end it clashes with the image of the man who died in the third sentence. Because such automatic category activation can go unnoticed, people often fail to resolve the riddle.

The present research concerns defaulting, but in regard to the sexual orientation of romantic couples rather than the gender of surgeons. Four studies examined the contexts in which people do and do not conceptualize romantic love as *heterosexual-by-default*. Herek's (2007) concept of *cultural heterosexism* suggests that such defaulting may reinforce heterosexist attitudes at the individual and societal level. Such defaulting in category activation can be understood by Kahneman and Miller's (1986) norm theory. Both are introduced below.

Cultural heterosexism

Cultural heterosexism is a socially structured ideology that disadvantages sexual minorities, via assumptions that people are heterosexual-by-default, and that homosexuality, when acknowledged, is 'unnatural,' exceptional, and requiring of particular explanation (Herek, 2007). The concept overlaps considerably with *heteronormativity,* which was also used in the 1990s to refer to the erasure and othering of non-heterosexual identities that occurs when general categories, but in *queer theory* (see Seidman, 1991; Warner, 1993). Queer theorists in the 1990s took on the task of rooting out concealed heteronormative ideologies (see Turner, 2000 for a history). Queer theory was deeply indebted to Foucaultian critiques of the psychological disciplines as an operation of ideological power/knowledge (see e.g., Butler, 1990; Halperin, 1997; Sedgwick, 2008), and it had limited impact on social psychology during this period (see Minton, 1997 for a notable exception). Thus 'cultural heterosexism' and 'heteronormativity' have overlapping meanings, but very different intellectual histories. *Heteronormativity* has since come to take on a wider range of meanings in the interdisciplinary literature (see Marchia & Sommer, 2019). Our preference for 'cultural heterosexism' here reflects more the fact that this paper is psychological in its scope, than any particular difference between these two terms that both aim to name this oppressive ideology. In this context, the *psychological* term is the more parsimonious one that makes no false promise of an interdisciplinary conversation. We have described how materialist feminism may be used to diffract this seeming impasse between cognitive analysis of concepts and the interdisciplinary demands to queer theory elsewhere.

Cultural heterosexism works through laws, language, institutions, and individual thoughts and attitudes (Herek, 2007). In its emphasis on defaults, cultural heterosexism is psychologically similar to such constructs as androcentrism (Bailey, LaFrance, & Dovidio, 2019), White privilege (McIntosh, 1988), and cisgenderism (Ansara & Hegarty, 2012). Like these other defaulting ideologies, cultural heterosexism can affect individuals' thinking about which people and groups are implicitly represented by categories, such as 'women' (Butler, 1990), 'citizens' (Bell & Binnie, 2000), 'family' (Kitzinger, 2005), and 'Black men' (Petsko & Bodenhausen, 2019). As such, cultural heterosexism entails failing to consider lesbian, gay, bisexual, or queer (LGBQ+) cultures as cultures in their own right (Lauretis, 1991), and attributing group differences by sexual orientation as residing *in* LGBQ+ individuals (Hegarty & Pratto, 2001).

The cultural heterosexism concept suggests that same-gender couples might still be conceptualized as exceptional, and heterosexual couples as the default, even in the context of equal marriage laws. Social behaviour that is newer, uncommon, lower status, unexpected, or perceived as less-than-ideal can all appear to require particular

explanation (Bruckmüller, Hegarty, Teigen, Böhm, & Luminet, 2017). Heterosexual relationships are historically older, more common, higher status, and reflected in cultural ideal scripts such as gender complementarity (Glick & Fiske, 1996). Consistent with the cultural heterosexism concept, recent media accounts of divorce rates explain same-gender couples' divorces against the background norm of opposite-gender couples' divorces almost all of the time (Hegarty, Szczerba, & Skelton,2020).

Category norms

We argue that ideologies such as cultural heterosexism might impact cognition (see also Bailey *et al*., 2019) both through the graded *structure* of categories and the ways that categories are *activated*. Graded structure refers to the notion that category members vary in how prototypical they are (Rosch, 1973). For example, a robin is a more prototypical bird than a penguin. As such, cultural heterosexism may render heterosexual category members more prototypical than LGBQ+ members in long-term memory representations of romantic love. In addition, heterosexual forms of loving may be activated more readily than LGBQ+ forms when thinking about 'romantic love.' Kahneman and Miller's (1986) *category norms* theory argues that both the graded structure of category knowledge in long-term memory and the activation of accessible exemplars determine what becomes the normative, taken-for-granted assumptions about a category. Category norms are working-memory representations evoked by reference to a specific category (e.g., *surgeon*). Such references recruit the most accessible exemplars from long-term memory (e.g., male surgeons). The accessibility of such exemplars is influenced by their prototypicality, but also by recently activated knowledge. For example, recent thoughts about an unrelated female doctor might affect how a person interprets the surgeon riddle. Category norms also differ from prototypes because category norms' modal values become *implicit* in working memory (Kahneman & Miller, 1986). Thus, this theory provides a cognitive understanding of how and why heterosexuality could become the default representation of love in many, but not all, circumstances, and that defaulting might pass unnoticed.

Ideologies may influence category norms by determining their contents. As well as prototypical and recently activated exemplars, category norms are more likely to contain members of more numerous groups and higher-status groups (e.g., men, White people, and heterosexual people; Hegarty & Bruckmüller, 2013). For example, participants tend to explain empirical differences between groups by focusing on factors particular to women, ethnic minorities, or LGBQ+ individuals – evidencing the normative status of the complimentary higher-status groups. This paper does not aim to weigh up which factors might make heterosexual love the norm. Rather, we examine how cultural heterosexism might be a consequence of category knowledge and category activation processes. Little research has yet tested whether similar social identity defaulting occurs in perceptions of emotion categories (but see Johnson, McKay, & Pollick, 2011). However, evidence shows that people have prototypes of *romantic love*, which include diverse traits that vary in their centrality (Fehr, 1988; Fehr & Sprecher, 2009; Regan, Kocan, & Whitlock, 1998; see also Rosch & Mervis, 1975). Hence, the activation and implementation of these prototypes may be susceptible to heterosexist category norms. Indeed, many past studies of romantic love conceptualized heterosexuality as the default relationship status without justification (Thorne, Hegarty, & Hepper, 2019). The present studies examine if cultural heterosexism (Herek, 2007) can be extended to concepts of romantic love, by studying prototypes of romantic love through the lens of defaulting-to-heterosexuality. Our research question is

whether ordinary people conceptualize mixed-gender love as being more similar to 'love' in general than same-gender love, due to processes of category norm activation.

The present research

Four studies examined when romantic love is conceptualized as *heterosexual-by-default*. Since the work of Rosch (1977), category prototypes have been studied through feature generation, typicality ratings, and timed feature classification tasks, including the prototypical structure of lay concepts of love (e.g., Fehr, 1988; Regan *et al.*, 1998) and relationships (e.g., Fitness & Fletcher, 1993). The present research uses this prototype approach to examine concepts of romantic love across sexual orientation target groups for the first time. Following classic prototype research we asked participants to recruit features of romantic love (Studies 1–2), rate their prototypicality (Study 3), and judge their inclusion in the category under time pressure (Study 4). We examined participants' *default* concept of love (e.g., Regan *et al.*, 1998), as well as *sexual orientation-specific* concepts that referred to heterosexual, lesbian, or gay male couples. Our primary heterosexual-by-default hypothesis predicted that default concepts of love would overlap to a greater extent with heterosexual-specific concepts than with either lesbian-specific or gay-specific concepts. We also examined the boundaries of this effect in terms of participant groups (Study 2) and recent category activation (Study 4).

Study 1: Feature generation among heterosexual participants

Heterosexual participants retrieved features associated with romantic love from memory in one of four conditions (feature generation). In these conditions, the couple was unspecified (i.e., default condition) or was specified by one of three sexual orientations (i.e., heterosexual-specific, lesbian-specific, or gay-specific conditions). All participants were heterosexual-identified. We predicted that their heterosexual-specific concepts would have a more similar graded structure to the default concept than would either their lesbian- or gay-specific concepts.

Method

Participants

Previous studies indicate a sample of 200 is sufficient to identify a prototypical structure (e.g., Fehr, 1988; Regan *et al.*, 1998). Via research websites, social media, and snowball sampling we recruited 583 respondents for a study on perceptions of romantic love – there was no mention to sexual orientation-specific romantic love in recruitment. Of the 583 respondents, 329 left the survey incomplete. Attrition was significantly higher in the lesbian- and gay-specific conditions (59%) than the default and heterosexual-specific conditions (52%; $\chi^2(1) = 4.34$, $p = .04$). We excluded participants whose sexual orientation was non-heterosexual ($n = 35$) or unreported ($n = 12$). The final sample comprised 207 heterosexual participants (77% female; aged 16–73, $M = 23.42$, $SD = 8.76$).[1] Details of participants' self-identified ethnic backgrounds are presented in Table 1.

---

[1] *Removing the one self-identified non-binary participant did not change results.*

Table 1. Self-description of participants' ethnic backgrounds (*n* > 1) in Studies 1–4

	Frequency	Percentage
Study 1		
White	60	57.97
Caucasian	21	20.29
White British	13	12.56
Hispanic	11	10.63
African American	10	9.66
White and Irish	4	3.86
Asian	3	2.90
Black	3	2.90
White European	3	2.90
White, Caucasian	3	2.90
American	2	1.93
British	2	1.93
Indian	2	1.93
Irish	2	1.93
Latina	2	1.93
Mixed	2	1.93
Unique terms	61	29.47
Study 2		
White	52	25.74
White British	41	20.30
Caucasian	13	6.44
Asian	12	5.94
Indian	6	2.97
Southeast Asian	5	2.48
British	3	1.49
Vietnam	3	1.49
African American	2	0.99
Chinese	2	0.99
Hispanic	2	0.99
White European	2	0.99
Unique terms	55	27.23
Study 3		
White British	40	25.97
White	16	10.39
Swedish	9	5.84
Caucasian	5	3.25
Asian	3	1.95
British	3	1.95
European	3	1.95
African	2	1.30
Asian Indian	2	1.30
Black African	2	1.30
British Asian	2	1.30
Chinese	2	1.30
Greek	2	1.30
Mixed	2	1.30
Scandinavian	2	1.30

Table 1. (*Continued*)

	Frequency	Percentage
White European	2	1.30
Unique terms	55	35.71
Study 4		
White British	62	55.36
White	10	8.93
British	5	4.46
Chinese	3	2.68
Black African	2	1.79
British Pakistani	2	1.79
White English	2	1.79
White European	2	1.79
Unique terms	24	21.43

Note. A small number of participants in Study 1 ($n = 3$), Study 2 ($n = 4$) and Study 3 ($n = 2$) did not provide details of their ethnic background.

Materials and procedure

The online survey software randomly assigned participants to the *Default* ($n = 63$), *Heterosexual-Specific* ($n = 51$), *Lesbian-Specific* ($n = 47$), or *Gay-Specific* ($n = 46$) condition.[2] In the default condition, participants read the following prompt adapted from Regan *et al*. (1998):

We would like you to think of the concept of romantic love between *heterosexual people*, or how *heterosexual people* experience love. Romantic love has a number of different features or characteristics. Some of these features may be very central (important or essential) to the experience of romantic love. Other features may be less central to romantic love – we don't automatically think of them when we think of the state of 'being in romantic love'. These features can include a range of emotions, feelings, thoughts, behaviours, actions or events and can range from positive to negative. We would like you to list as many features of romantic love as you can. We remind you to think about love between *heterosexual people* when making your list of features.

In the sexual orientation-specific conditions, participants were additionally prompted to think about the respective target group (e.g., opening sentence for the gay-specific condition: 'We would like you to think of the concept of romantic love between gay men, or how gay men experience love'). Participants were provided with an open-ended text box and engaged with this task for at least 5 min.

Among several metacognitive and demographic items (see Supplementary Materials), participants selected which one of four options best described the type of relationship they were thinking about during the task (*heterosexual relationship*, *homosexual relationship*, *other relationships*, *other things*). We refer to this variable as 'Relationship Focus.' Participants reported their age, occupation, and self-identified gender and ethnicity.

---

[2] *Due to the withdrawal rates from the lesbian- and gay-specific conditions, replacement rates were higher in these conditions.*

Table 2. The top 50 generated features and the percentage of participants in each condition generating each feature

		Default	Heterosexual-specific	Lesbian-specific	Gay-specific
1	Happiness	37	23	13	18
2	Trust	23	18	13	14
3	Spend time together	23	17	11	9
4	Caring	20	14	13	11
5	Sexual activity	18	12	14	13
6	Romance	19	22	7	9
7	Kissing	19	17	8	12
8	Touching/Holding	20	17	8	10
9	Support	20	11	9	11
10	Commitment	10	13	11	16
11	Communication	14	14	11	8
12	Kindness/thoughtfulness	9	11	10	11
13	Honesty	15	6	9	10
14	Intimacy	16	8	10	6
15	Companionship/Friendship	11	9	9	8
16	Passion	9	8	9	10
17	Smiles Laughter	11	11	4	7
18	Chemistry	9	11	5	8
19	Do special things for each other	9	15	3	6
20	Unity/completeness/fulfilment	11	5	4	11
21	Sexual attraction/desire	6	13	2	10
22	Fidelity/loyalty	7	12	4	7
23	Acceptance/tolerance	8	9	5	8
24	Caresses	11	11	3	5
25	Empathy	7	4	9	10
26	Affection	8	11	6	4
27	Attachment Bond	8	6	11	3
28	Miss other/want to be together	9	12	3	3
29	Excitement	10	9	4	4
30	Security	13	4	4	4
31	Arguments	9	5	7	3
32	Personal sacrifice	16	6	0	2
33	Making compromises	8	6	6	3
34	Closeness	8	4	4	7
35	Mutuality	5	5	4	7
36	Fun	8	4	3	6
37	Respect	5	8	3	4
38	Shared interests	4	6	4	6
39	Marriage	3	9	2	6
40	Want to please other	9	7	3	1
41	References to gender/sexuality	1	0	11	8
42	Jealousy	8	7	3	1
43	Warmth	8	5	3	3
44	Devotion	8	8	1	1
45	Daydreaming/thinking of other	7	9	1	1
46	Silliness	8	5	3	1
47	Nervousness	7	5	5	0

Table 2. (*Continued*)

		Default	Heterosexual-specific	Lesbian-specific	Gay-specific
48	Obsession/infatuation	7	8	I	0
49	Comfortable	8	5	2	0
50	Sympathy	4	I	7	3

Coding

Open-ended responses were coded in two stages. First, the lead author classified responses into 2,814 items, breaking complex responses into multiple items. Responses stating that love is 'love' (*n* = 26) were excluded. Two independent judges, blind to condition, categorized the remaining 2,788 items into the 119 codes described by Regan *et al.* (1998), and an *Other* code included items that did not fit within Regan et al.'s scheme. Both judges devised and agreed upon 26 new codes for the *Other* items, and reliably coded the items into the resulting 145 categories (Krippendorff's α = .82). Most discrepancies were resolved, but when not possible the first judge's codes were used. Unique responses generated by only one participant that could not be classified into one of the 145 categories (*n* = 151) were excluded from analysis. The number of participants generating each feature at least once per condition was calculated; these *feature frequencies* operationalized prototypes of romantic love (see Thorne, 2018 for further details).

Results

Feature generation

A one-way ANOVA revealed significant differences between conditions in the number of features generated ($F(3,203) = 3.90$, $p = .01$, $\eta^2 = .06$). Simple-effects analyses, with Bonferroni correction for multiple comparisons,[3] indicated no significant differences between the default condition (*M* = 11.38, *SD* = 5.94) and any sexual orientation-specific conditions (*p*s > .10). Trends indicated a higher number of generated features in the heterosexual-specific condition (*M* = 12.08, *SD* = 5.41) than the lesbian-specific (*M* = 9.09, *SD* = 5.01; $t(96) = 2.68$, $p = .009$, $d = 0.56$) and gay-specific conditions (*M* = 9.24, *SD* = 5.01; $t(95) = 2.58$, $p = .01$, $d = 0.51$). However, these simple effects were non-significant after correction. No other comparisons were significant (*p*s > .10).

To test our main hypothesis, we examined frequencies of specific features across conditions (Table 2; see Supplementary Materials for full list). We calculated Spearman's Rho correlations between feature frequencies in each of the four conditions, taking the feature as the unit of analysis (Table 3). All correlations were moderately strong, positive, and significant, showing considerable overlap in the graded structure of prototypes across conditions. Fisher's Exact Z-Test showed that feature frequencies in the default condition correlated more strongly with those in the heterosexual-specific condition than with those in the lesbian-specific ($z = 3.67$, $p < .001$) or gay-specific conditions ($z = 3.33$, $p < .001$). Feature frequencies in the default condition correlated similarly with those in

---

[3] *We use Bonferroni correction for multiple comparisons throughout.*

Table 3. Rank correlations [and 95% confidence intervals] between feature generations in each condition, among heterosexual (Study 1), lesbian/gay male, and bisexual participants (Study 2)

	Condition		
	Default	Heterosexual-specific	Lesbian-specific
Study 1: Heterosexual participants			
Heterosexual-specific	.75$_a$ [.66, .82]		
Lesbian-specific	.57$_b$ [.44, .68]	.48$_a$ [.34, .60]	
Gay-specific	.59$_b$ [.47, .69]	.55$_a$ [.42, .66]	.68 [.58, .76]
Study 2: Lesbian/Gay Male participants			
Heterosexual-specific	.56$_a$ [.45, .66]		
Lesbian-specific	.43$_b$ [.30, .54]	.49$_a$ [.37, .60]	
Gay-specific	.57$_a$ [46, .66]	.45$_a$ [.32, .56]	.49 [.37, .60]
Study 2: Bisexual participants			
Heterosexual-specific	.59$_a$ [.48, .68]		
Lesbian-specific	.55$_a$ [.44, .65]	.42$_a$ [.29, .54]	
Gay-specific	.56$_a$ [.45, .66]	.45$_a$ [.32, .56]	.49 [.37, .60]

Note. Correlations that do not share a subscript within rows are significantly different ($p < .05$, Fisher's Z).

the lesbian- and gay-specific conditions ($z = 0.34$, $p = .73$). As predicted, heterosexual-specific concepts of romantic love resembled the default concept more than the lesbian- and gay-specific concepts did.

To describe this difference between concepts further, chi-square tests compared the frequencies of all 41 features mentioned by at least 10% of participants in the heterosexual-specific condition to feature frequencies in the lesbian- and gay-specific conditions. After Bonferroni, frequencies differed for two features (*personal sacrifices* and *references to gender and sexuality*). Participants generated significantly fewer references to *gender* and *sexuality* (e.g., 'knowing the needs of a female,' 'same as heterosexuals basically') in the heterosexual-specific condition (2%) than the lesbian-specific condition (23%; $\chi^2(1) = 13.45$, $p < .001$) but not the gay-specific condition (17%; $\chi^2(1) = 9.67$, $p = .002$).

Relationship focus
Participants' self-reported focus during the task varied by condition (Table 4). As few participants (5.8%) indicated thinking about 'other relationships' or 'other', these responses were excluded. Supporting the heterosexual-as-default hypothesis, all other participants in the default and heterosexual-specific conditions reported thinking about heterosexual couples. However, only a minority of participants in the lesbian-specific, and half of participants in the gay-specific condition, reported thinking about the specified same-gender couple during the task.

Discussion
In Study 1 heterosexual-identified participants conceptualized default and sexuality-specific concepts of love in overlapping ways. Consistent with the heterosexual-by-default hypothesis, the default concept of romantic love resembled the concept generated by those thinking about heterosexual couples more than it resembled the concept of

Table 4. Relationship focus by sexuality condition (%) in Studies 1–4

Type of relationship focus	Condition			
	Default	Heterosexual	Lesbian	Gay male
Study 1				
Heterosexual	97	98	66	46
Homosexual	0	0	26	43
Study 2				
Gay/Lesbian participants				
Heterosexual	3	76	0	5
Homosexual	93	24	95	95
Bisexual participants				
Heterosexual	65	71	16	29
Homosexual	29	6	74	62
Study 3				
Heterosexual	100	97	77	69
Lesbian	11	0	62	20
Gay Male	9	0	21	69
Study 4				
Heterosexual	–	97	94	93
Lesbian	–	14	63	25
Gay Male	–	22	20	68

Note. In Studies 1–2, participants had to select one option, whereas in Studies 3–4, participants could select more than one option.

generated by those thinking about either lesbian women or gay male relationships. Tellingly, participants who were asked to conceptualize same-gender love were more likely both to drop-out, and to report thinking about heterosexual relationships. Together, these patterns suggest that participants found it more difficult to access and report their knowledge of same-gender relationships.

Study 2: Feature generation among lesbian, gay and bisexual participants

Results of Study 1 were consistent with our heterosexual-by-default hypothesis, but are open to alternative explanations. Given that participants were heterosexual-identified, the similarity between heterosexual-specific and default concepts could have been caused by in-group projection from heterosexual attributes to the default prototype (Mummendey & Wenzel, 1999). Accordingly, Study 2 replicated Study 1 among lesbian-, gay-, and bisexual-identified people. In-group projection would be supported only if lesbian women and gay men were to conceptualize same-gender romantic love as closer to the default than heterosexual love. However, cultural heterosexism can be internalized by sexual minority individuals, meaning that heterosexual-specific concepts may resemble the default concept even for individuals in these minority groups. Lesbian women and gay men understand their sexual orientation to comprise *monosexual* (Anderlini-D'Onofrio & Alexander, 2009) same-gender love and attraction, whilst bisexual people experience more of a 'dual sexual orientation' (Hemmings & Blumenfeld, 1996). Accordingly, we analysed these two sexual minority participant groups separately.

Method

Participants

As in Study 1, we aimed to recruit 200 participants, via UK-based research websites, Facebook groups, the researchers' social networks, and *Prolific.ac*. Participants were unaware that we were only recruiting LGB participants. As with Study 1, participants were only informed that we were interested in their perceptions of romantic love. Among 587 respondents, 281 left the survey incomplete. We excluded participants with heterosexual-identified (n = 81) or unreported (n = 7) sexual orientation, or who failed to follow instructions (n = 16). The final sample included 99 female, 90 male, 11 non-binary, two unspecified participants (see Table 1 for self-identified ethnic background) aged 18–60 (M = 28.81, SD = 8.96). Participants self-identified as lesbian or gay (n = 98), bisexual (n = 74), and non-heterosexual (n = 30). Most (n = 111) received compensation of GBP £1.

Materials and procedure

The design, measures and procedure were identical to Study 1. Participants were randomly assigned to the default (n = 51), heterosexual-specific (n = 50), lesbian-specific (n = 50), or gay-specific condition (n = 51).

Coding

The coding procedure was identical to Study 1. Two independent judges coded 2,480 items using the 119 codes from Regan *et al*. (1998). Undecipherable responses, synonyms of love, and messages to the experimenter were excluded (n = 78). The resulting 2,402 items were assigned to 231 categories: 110 of Regan et al.'s codes and 121 new categories (e.g., *meeting families/friends*, *polyamory*, *knowing the partner*). Inter-rater reliability was very high (Krippendorff's α =.97); in the few unresolved discrepancies, the first judge's code was used. Unique items generated only once were excluded (n = 58), leaving 173 features. As with Study 1, the *feature frequencies* (i.e., number of participants generating each feature) operationalized each prototype.

Results

Overall, LGB participants generated a large number of unique features of love that were not generated by Study 1's heterosexual participants (e.g., *monogamy*, *freedom*; see Supplementary Materials), indicating distinct features of LGB participants' representations of romantic love that are not shared by the heterosexual sample. Unlike Study 1, the average number of features generated per participant did not differ between conditions (F (3, 198) = .88, p = .45, η^2 = .01).[4]

As in Study 1, we calculated Spearman's Rho correlations between the four conditions' feature frequencies, separately by sexual identity group (Table 3).[5] Among *lesbian women and gay men*, feature frequencies in the default condition correlated significantly more strongly with those in the heterosexual-specific condition than with those in the lesbian-specific condition (z = 1.68, p = .047), but not those in the gay-specific condition (z = .04, p = .48). Also, feature frequencies in the default condition correlated significantly more

---

[4] *These results remain non-significant when testing differences within self-identified sexuality groups (e.g., lesbians).*
[5] *Participants who did not identify as lesbian, gay or bisexual (n = 4–9 per condition) were not included in this analysis.*

strongly with those in the gay-specific condition than with those in the lesbian-specific condition ($z = 1.72$, $p = .04$). Thus, among self-identified lesbian women and gay men, heterosexual love and gay love overlapped equivalently with the default concept, and both overlapped with it more than the lesbian concept did. Among *bisexual participants*, correlations between feature frequencies across all conditions did not differ ($ps > .56$).

As with Study 1, chi-square tests compared frequency of generation of the 31 features mentioned by at least 10% of participants in the heterosexual condition to the frequencies of the same features in the lesbian-specific and gay-specific conditions. No significant differences emerged for any of these features across conditions after Bonferroni correction, for either lesbian/gay male or bisexual participants. Notably, unlike Study 1, the number of participants referencing *gender and sexuality* did not differ significantly between conditions for either lesbian/gay male ($\chi^2(3) = 5.34$, $p = .15$) or bisexual participants ($\chi^2(3) = 3.85$, $p = .28$).

Relationship focus

In contrast to Study 1's heterosexual participants, most sexual minority participants reported focusing on the specified couple type in all sexuality-specific conditions (Table 4). Also, in the default condition, lesbian women and gay men almost all focused on same-gender love most often, whilst a majority of bisexual participants focused on heterosexual love.

Discussion

In contrast to the heterosexual-identified participants in Study 1, LGB participants had no difficulty in calling to mind diverse couples. Lesbians' and gay men's default prototypes of romantic love overlapped with concepts of heterosexual and gay male relationships, more than they overlapped with concepts of lesbian relationships. The findings indicate a pattern of intersecting category norms more subtle than either simple cultural heterosexism or in-group projection predictions. We return to this point in the General Discussion. Bisexual people's default concepts overlapped to a similar extent with all sexual orientation-specific concepts, perhaps reflecting the experience of being attracted to more than one gender in a monosexual world (Meyer & Wilson, 2009).

Studies 3 and 4 examined more closely the roles of long-term knowledge and cognitive activation in explaining the heterosexual default concepts of romantic love among heterosexual people.

Study 3: Feature ratings among heterosexual participants

Study 1 found default and sexual orientation-specific concepts of romantic love to be distinct but overlapping in a *feature-generation* task. In Study 3 participants *rated* the importance of features of romantic love in a four-condition design that resembled Studies 1 and 2 (feature rating). Previous research has indicated medium to high correlations between concepts inferred from the feature-generation task used in Studies 1 and 2 and feature ratings elicited in Study 3 ($rs \sim.30$–$.58$; see Fehr, 1988; Hassebrauck, 1997; Hepper *et al.*, 2012). Unlike feature generation, feature rating is not affected by the accessibility of the feature in long-term memory (Higgins, 1996). As such, a conceptual replication of Study 1's patterns in a feature-rating task would suggest that cultural heterosexism is a consequence of difference in participants' long-term memory representations of romantic

couples. A null result would point instead to the possibility that cultural heterosexism arises during category activation, due to the different accessibility of sexual orientation-specific concepts of romantic love.

Method

Participants
Our recruitment target and strategy followed those of Study 1. As with Studies 1 and 2, participants were only informed that the study was about romantic love. Of 437 respondents, 239 left the survey incomplete. Attrition, though lower than Study 1, was again higher in the lesbian- and gay-specific conditions (49%) than the default and heterosexual-specific conditions (38%; $\chi^2(1) = 4.62, p = .03$). We excluded participants whose sexual orientation was non-heterosexual ($n = 35$) or unreported ($n = 9$). The drop-out rate left the sample smaller than projected ($N = 154$; 82% female; aged 17–62, $M = 27.61$, $SD = 9.24$). See Table 1 for details of participants' self-identified ethnic backgrounds.

Materials and procedure
The online survey software randomly assigned participants to *default* ($n = 45$), *heterosexual-specific* ($n = 39$), *lesbian-specific* ($n = 34$), or *gay-specific* ($n = 36$) conditions. Participants viewed 50 features of romantic love, including the 46 most frequently generated features overall in Study 1 and four features generated more often in the lesbian- and gay-specific conditions than in the default and heterosexual-specific conditions of Study 1 (e.g., *gender and sexuality*). Following opening instructions as in Study 1 (adapted from Regan *et al*., 1998), participants in the default condition were asked for each feature to 'indicate how central (important or essential) you think it is to the concept of 'romantic love' (1 = *not at all important*, 7 = *very important*). Participants in the three sexual orientation-specific conditions were additionally prompted to think about the relevant target group. Finally, to assess Relationship Focus, participants were asked to indicate *all* the relationship types that they were thinking about (heterosexual, gay, lesbian). Participants also reported their age, occupation, and self-identified gender and ethnicity.

Results

Ratings
After excluding two multivariate outliers (Mahalanobis Distance > critical chi-square [$df = 7$]), the mean rating for each feature in each condition was calculated. Overall, ratings varied considerably across features, with some rated extremely prototypical, or *central* (e.g., happiness) and others less prototypical, or *peripheral* (e.g., shyness; see Supplementary Materials for mean rating of each feature).[6] Taking the feature rating as the

---

[6] *A MANCOVA analysis was conducted with sexuality condition as the IV, the 50 features of love as the DV, and age, gender (Female vs. Male vs. Other), and occupation (Student vs. Other) as covariates. Gender emerged significant (p = .016) because male participants generally gave slightly higher ratings than female participants. Age also emerged as significant covariate (p = .025); younger participants were found to give higher ratings than older participants. However, even when the covariates variables were controlled for, no significant differences emerged between sexual orientation conditions. We did not include ethnicity as we did not want to take away from people's self-identifications, this variable was simply used to get a better idea of the characteristics of our sample.*

unit of analysis, we calculated Spearman's Rho correlations between conditions (Table 5). Two informative findings warrant comment. First, all correlations were very high, indicating near-identical conceptual structure across default and sexual orientation-specific conditions. Fisher's Exact *Z*-Test showed that none differed significantly. Second, correlations between the frequencies of generation of these 50 features in Study 1 and their respective ratings in Study 3 were moderate, replicating prior findings that the concepts derived from feature-generation and feature-rating tasks are not identical.

Relationship focus

All participants in the default and heterosexual-specific conditions reported thinking about heterosexual couples, whilst few reported thinking about lesbian or gay couples (Table 4). In the lesbian- and gay-specific conditions, most participants reported thinking about both heterosexual and relevant same-gender couples, whilst a few reported thinking about condition-irrelevant same-gender couples. Notably, a higher number of participants indicated thinking a heterosexual relationship in the lesbian-specific condition than in the gay-specific condition, similar to Study 1.

Discussion

Study 3 showed no differences between sexual orientation-specific and default concepts. This finding suggests that the differences between conditions observed in Study 1 were likely a consequence of category activation differences. Distinct but overlapping concepts were elicited by feature-generation and feature-rating tasks across the two experiments as in past research. Jointly, Studies 1 and 3 suggest that heterosexual people can conceptualize love among same-gender couples, but that such concepts are harder to access, leading to a greater overlap between heterosexual and default conceptions of romantic love category features must be accessed. Study 4 examined category activation effects directly.

Study 4: Feature accessibility among heterosexual participants

Study 4 investigated heterosexual participants' activation of romantic love concepts after being prompted (or not) with sexual orientation-specific concepts. Participants performed timed forced-choice tasks in which they verified whether features were relevant or not to default and sexual orientation-specific prototypes of romantic love (Fehr, 1988; Hepper *et al.*, 2012). This speeded feature-verification task was more cognitively demanding than the untimed feature-rating task in Study 3, but did not require the recruitment of exemplars as did the feature-generation task in Study 1.

Each participant completed two tasks, in which they verified features to the default concept of love, *and* to one of three sexual orientation-specific concepts of love (i.e., heterosexual-, gay- or lesbian-specific). We measured the *number of features verified* by participants to assess the breadth of their concepts in each task. We predicted that participants would verify more features in the heterosexual-specific condition than in the other sexual orientation-specific conditions. We used *reaction times* to examine if the matching task created a similar or different cognitive load across tasks (Fehr, 1988; Hepper *et al.*, 2012). As in past research, we identified *central* and *peripheral* features of romantic

Table 5. Rank correlations [and 95% confidence intervals] in ratings of features between sexuality conditions (Study 3) and between ratings and respective feature-generation frequencies from Study 1

	Study 3 ratings by condition			
	Default	Heterosexual	Lesbian	Gay male
Study 3 ratings				
Default	–	.96 [.93, .98]	.96 [.93, .98]	.97 [.95, .98]
Heterosexual	–		.95 [.91, .97]	.96 [.93, .98]
Lesbian			–	.98 [.97, .99]
Study 1 generation frequencies (respective condition)	.55 [.44, .64]	.46 [.34, .57]	.52 [.41, .62]	.54 [.43, .64]

love for use as stimuli using a median split of feature ratings from Study 3 (Fehr, 1988; Hassebrauck, 1997).

Crucially, we manipulated the order of the two tasks, to examine possible effects of activating one representation of romantic love on another (see also Herr, Sherman, & Fazio, 1983). Participants completed either the default task or a sexual orientation-specific task first. This design first allowed for comparisons of the default and sexuality-specific concepts activated by the first task. Second, this design allowed a test of the effect of activating the first concept on the second concept. We anticipated that when *default* concepts of love are activated first, participants would distinguish less between sexual orientation-specific concepts in the second task, as the activated default concept would be similar across conditions. In contrast, when *sexual orientation-specific* concepts are activated first, we anticipated that there would be differences between the different sexual orientation conditions (as in Study 1), and these differences would affect the default task as they will be interpreting the task in terms of their already activated concept.

Method

Participants

We aimed to recruit as many participants as we could within the academic semester (or year, depending). A sensitivity analysis with .80 power indicated that the obtained sample provides enough power to detect an effect size of .30 across the three sexual orientation conditions and an effect size of .27 across the two order conditions. The obtained sample size also has sufficient power to detect an interaction effect size of .21. We recruited 137 students and staff at a UK university in exchange for £5 ($n = 64$) or course research-participation token ($n = 73$). Participants were only informed that the study was about romantic love. Participants were excluded if they identified as non-heterosexual ($n = 15$) or engaged in random button-pressing, meaning they gave the same response to every trial ($n = 10$). The final sample comprised 112 heterosexual-identified participants (85% female, age 18–54, $M = 21.54$, $SD = 5.64$). See Table 1 for details of participants' self-identified ethnic backgrounds.

Design

Study 4 had a 3 (*sexual orientation-specific task*) × 2 (*task order*) design. All participants completed the default task and one of three sexual orientation-specific tasks (i.e.,

heterosexual-, lesbian-, or gay-specific), with the order of these two tasks randomly assigned. Within each task, participants verified central, peripheral, and distractor features. The percentage of features verified, and the mean reaction time to verify those features, were the main dependent variables.

Materials and procedure

The task was presented using E-Prime v2.0. Prior to the main blocks, participants completed a 40-trial practice block. Each task (default and sexual orientation-specific) had 101 trials, presented in two blocks. The trials included 50 features of romantic love from Study 3 (the feature *Gender and Sexuality* was decomposed into two items; *gender* and *sexuality*). These 51 items were categorized as central ($n = 25$) or peripheral ($n = 26$). The remaining 50 items were distractors unrelated to love.

Participants were instructed in each trial to indicate as quickly as possible whether or not each feature was associated with the relevant concept of romantic love. Each feature appeared in the centre of the screen and remained until the participant responded using the 'P' and 'Q' keys (counterbalanced across participants). Finally, participants completed metacognitive and demographic items. Participants also reported their age, occupation, and self-identified gender and ethnicity.

Results

Transformation and screening

Latencies below 300 ms and above 3,000 ms, indicating extremely fast or slow responses, were recoded to 300 and 3,000 ms, respectively (Greenwald, Nosek, & Banaji, 2003). Only reaction times for correctly verified responses (i.e., 'yes' responses) were analysed following previous prototype research (e.g., Hepper *et al.*, 2012). A logarithmic transformation was applied to all variables.

Feature verification

Consistent with prior prototype research, participants verified more central features ($M = 95.75\%$, $SD = 3.95$) than peripheral features ($M = 76.01\%$, $SD = 12.31$; $z = 8.85$, $p < .001$), and more peripheral features than distractor features ($M = 2.66\%$, $SD = 3.90$; $z = 9.19$, $p < .001$). These results confirmed the categorization of features as central or peripheral. We did not analyse responses to the distractor features further.

To test our main hypotheses, we conducted a 3 (Sexual orientation-Specific Condition: Heterosexual, Lesbian, Gay Male) × 2 (Task Order: Default First, Sexual orientation-Specific First) × 2 (Feature Type: Central, Peripheral) × 2 (Task Number: First, Second) mixed-ANOVA. A large Feature Type main effect was observed; participants verified more central ($M = 95.75$, $SD = 3.95$) than peripheral features ($M = 76.01$, $SD = 12.31$; $F(1,106) = 287.03$, $p < .001$, $\eta^2 = .73$).

Two significant interactions were observed. There was a significant interaction between Feature Type × Task Number ($F(1,106) = 13.90$, $p < .001$, $\eta^2 = .12$) which was qualified by a significant four-way interaction involving all factors ($F(2,106) = 4.36$, $p = .02$, $\eta^2 = .08$). Accordingly, and reflecting our hypotheses about the impact of category activation in Task 1 on Task 2, we interpreted this interaction by splitting the data by feature type and order condition. In other words, for each of the four intersections of

Table 6. Percentage of peripheral features verified by trial type, trial order and sexuality condition (Study 4)

Trial type		Default		Sexuality-specific	
Trial order	Sexuality	Mean (SD)	95% CI	Mean (SD)	95% CI
Sexuality-specific first, default second	Heterosexual	82.19 (13.58)$_a$	[75.44, 87.31]	81.38 (12.31)$_a$	[75.64, 88.73]
	Lesbian	74.29 (14.56)$_{ab}$	[67.27, 81.31]	71.46 (14.06)$_{ab}$	[64.68, 78.24]
	Gay male	72.03 (8.49)$_b$	[67.92, 74.04]	70.98 (6.89)$_b$	[68.26, 75.79]
	Total	75.96 (12.88)	[71.30, 77.55]	74.42 (12.10)	[72.64, 79.29]
Default first, sexuality-specific second	Heterosexual	74.36 (13.52)$_a$	[67.64, 81.08]	77.78 (10.43)$_a$	[72.59, 82.97]
	Lesbian	78.85 (15.19)$_a$	[70.75, 86.94]	78.37 (12.55)$_a$	[71.68, 85.05]
	Gay male	74.36 (12.99)$_a$	[67.90, 80.82]	78.42 (14.46)$_a$	[71.23, 85.61]
	Total	75.74 (13.76)	[71.91, 79.57]	78.18 (12.34)	[74.74, 81.62]

Note. Means that do not share a subscript within columns and order manipulation differ significantly after Bonferroni correction ($p < .017$). There were no significant differences or interactions with central features (Ms ranged from 93.33 to 96.63, SDs ranged from 3.34 to 7.13).

feature type (central vs. peripheral) and order conditions (i.e., default first vs. sexual orientation-specific first), we conducted a 2 (Task Number) × 3 (Sexual orientation-Specific Condition) ANOVA on the percentage of features verified (see Table 6 for means).

We found no effects of task number or sexual orientation-specific condition on the percentage of *central* features verified in either of the order conditions. Participants verified equivalent central features across blocks and across sexual orientation conditions, regardless of whether they completed a *sexual orientation-specific task first* ($Fs < 1.58$, $ps > .21$) or completed the *default task first* ($Fs < 1$, $ps > .48$). Endorsement of the most central concepts of romantic love did not vary across task, order, or sexual orientation condition.

Next, we analysed the verification of *peripheral* features (Table 6). In the *sexual orientation-specific task first* conditions, we observed a main effect of sexual orientation condition ($F(2,57) = 4.21$, $p = .02$, $\eta^2 = .13$). Planned contrasts found that the heterosexual-specific concept was attributed significantly more peripheral features than the gay and lesbian-specific concepts ($t(30.44) = 2.82$, $p = .008$). We observed no effect of task number ($F(1,57) = 2.53$, $p = .12$, $\eta^2 = .04$). These results imply that participants called to mind different sexual orientation-specific concepts in the absence of other prompts, as predicted (and in line with Study 1). Moreover, the lack of any task number by condition interaction implies that concepts remained distinct between conditions even during the second, default task. It seems that in this condition, different sexual orientation-specific concepts were activated in the first task, and shaped the subsequently activated 'default' concept.

We turned to the verification of peripheral features in the *default task first* conditions (Table 6, upper panel). Participants verified significantly fewer peripheral features in the first (default) task ($M = 75.74\%$, $SD = 13.76$) than in the second (sexual orientation-specific) task ($M = 78.18\%$, $SD = 12.35$), ($F(1,49) = 7.69$, $p = .01$, $\eta^2 = .14$). However, there was no main effect of sexual orientation-specific condition ($F(2,49) = .19$, $p = .85$, $\eta^2 = .01$), or condition × task number interaction ($F(2,57) = 1.78$, $p = .18$, $\eta^2 = .07$). Participants all completed the default task in this first trial and unsurprisingly did not differ in the number of concepts they recruited. In the second task, all concepts of romantic love were broader, but did not differ across sexual orientation conditions. As a consequence, lesbian- and gay-specific concepts were broader here than when sexual orientation-specific concepts were elicited first. Indeed, participants who conceptualized gay or lesbian romantic love after first conceptualizing the default concept verified 7% more peripheral features than those who conceptualized gay or lesbian romantic love as their first task (Table 6).

Reaction times

We examined reaction times using a 3 (Sexual orientation-Specific Condition: Heterosexual, Lesbian, Gay Male) × 2 (Task Order: Default First, Sexual orientation-Specific First) × 2 (Feature Type: Central, Peripheral) × 2 (Task Number: First, Second) mixed-ANOVA. Participants responded faster to *central* features ($M = 862.66$ ms, $SD = 179.70$ ms) than to *peripheral* features ($M = 970.36$ ms, $SD = 233.89$ ms; $F(1,106) = 91.28$, $p < .001$, $\eta^2 = .46$), consistent with prototype theory. Participants also responded faster as they moved from the first task ($M = 959.57$ ms, $SD = 233.32$ ms) to the second task ($M = 873.45$ ms, $SD = 184.72$ ms; $F(1,106) = 52.71$, $p < .001$, $\eta^2 = .33$), consistent with a practice effect.

These effects were qualified by two interactions. First, a Feature Type × Task Number interaction ($F(1,106) = 10.09$, $p = .002$, $\eta^2 = .087$) was observed. Participants responded faster to central features than peripheral features in all conditions, but this effect was weaker when the sexual orientation-specific tasks were completed first ($d = .41$) than when the default tasks were completed first ($d = .55$; $ps < .001$). In other words, participants were had more restricted concepts in the first trial, particularly if they completed a sexual orientation-specific task first. Second, a Task Order × Task Number interaction ($F(1,106) = 12.72$, $p = .001$, $\eta^2 = .11$) was observed. The difference in speed of responses was greater in the task completed first ($d = .51$) than the task completed second ($d = .32$; $ps < .001$). Furthermore, this practice effect was larger when the sexual orientation-specific task was completed first than when the default task was first. This suggests a greater effect of category activation when participants moved from a sexual orientation-specific task to the default task than the reverse.[7] There were no significant main effects or interactions involving sexual orientation-specific conditions ($ps > .58$).

Discussion

In Study 4, participants conceptualized sexual orientation-specific love as both different, and as similar, depending upon conditions in a timed feature-verification task. Participants who first conceptualized sexual orientation-specific love recruited the broadest concepts in regard to heterosexual-specific love (mirroring Study 1), and these differences persisted when they subsequently conceptualized a default conception of romantic love. However, when the default concept of love was assessed first, it led participants to verify a similar number of features to when they subsequently conceptualized romantic love between any of the three couples. As a consequence, the lesbian- and gay-specific concepts were more inclusive when they were constructed after calling to mind the default concept, compared to when they were recruited first.

Reaction time data suggest no difference in the ease of bringing sexuality-specific concepts to mind, and that all concepts became more accessible across tasks. Moreover, participants sped up across the experiment more when responding to peripheral than central features, and more where sexual orientation-specific concepts were recruited first. Sexual orientation-specific concepts looked most distinct in this experiment in the sexual orientation-specific conditions and in regard to these peripheral features. Calling to mind sexual orientation-specific concepts particularly facilitated the activation of somewhat different default conceptions of romantic love.

General discussion

Four studies showed how heterosexual-identified people can conceptualize love as equivalent irrespective of romantic partners' genders, but sometimes find it cognitively effortful to do so. Results of three different cognitive experiments suggest that although heterosexual-identified participants can fairly match the features of romantic love to lesbian and gay couples (Study 3), the concepts of love that they recruit under more effortful conditions can be sexual orientation-specific (Studies 1 and 4). Unlike LGB

---

[7] *In Study 4, a Mixed ANCOVA analysis testing the covariates of age, gender (Female vs. Male vs. Other), and occupation (Student vs. Other) found no significant covariates for either feature verification or reaction times. There were no interactions any of the three demographic variables and any of the IVs for feature verification. For reaction times, age interacted with trial number, but there were no interactions between sexual orientation-specific condition and any demographic variable.*

participants, heterosexual-identified participants were the only group who showed a unique overlap between a default conception of love and one that was specific to their own sexual orientation group (Studies 1–2). Heterosexual participants were also disproportionately reluctant to remain in studies in which they were asked to conceptualize same-gender love. Finally, heterosexual-identified participants, unlike their LGB counterparts, struggled to hold same-gender loving couples in mind when they did remain in those studies (Studies 1–3). These findings suggest that cultural heterosexism may be instantiated at the cognitive level by differences in the ease of accessing equivalent concepts of love when thinking about diverse romantic couples.

Consistent with Herek's (2007) claims about *cultural heterosexism*, and Kahneman and Miller's (1986) norm theory, these experiments explain how a common and higher-status feature such as heterosexuality can be 'conflated with' or 'assumed to be' the norm in social, political, and everyday discourse. They add to recent findings that explanations of differences between couples frame heterosexual couples as the linguistic norm, thus making group inequalities appear more legitimate (Hegarty *et al.*, 2020). Herek also emphasized that cultural heterosexism was long-standing but malleable. By demonstrating variability in the cognitive instantiation of the same concept by task, the present research illustrates that ideological point at the level of category activation, showing how and why 'romantic love' *can* be conceptualized in limited cultural heterosexist or heteronormative terms, and conceptualized in more inclusive terms. In other words, our findings suggest that cultural heterosexism shapes the *accessibility* of LGB exemplars (Higgins, 1996).

In developing concepts of love, people may draw upon their experiences in their in-group. However, the tendency to take heterosexual couples as default should not simply be attributed to in-group projection, motivated by social identity concerns, particularly because lesbian and gay male participants, continued to recruit heterosexual couples as the default (Study 2). In addition, recruiting both in-group-specific concepts and out-group-specific concepts influenced subsequent default concepts of romantic love among heterosexual participants (Study 3). This flexibility in the categories that people can access cannot, on its own, explain why heterosexuality might be the default norm for romantic love in some contexts. In addition to such *proximal* cognitive factors, it seems necessary to also invoke *distal* factors that structure the social environment in ways that position heterosexuality as a default norm, as LGBT psychologists have long argued to be the case. To do this it is additionally necessary to consider social cognition as occurring not in a vacuum but in an ideological context in which certain forms of relationship are positioned as more normative than others.

Of course, lesbian- and gay-specific concepts may also be harder to call to mind for heterosexual participants, but not LGB-identified participants, because these social identity labels overlay real differences in life experience, which also inform concepts. Rich accounts of such life experiences are beyond our cognitive studies, but LGB-identity formation has long been conceptualized as a process of creating a worldview that is epistemologically centred on the LGB identity rather than heterosexual norms (Cass, 1979; Johnson, 2015). The influence of cultural heterosexism on the psychology of sexual minority individuals is most often described as occurring through the internalization of negative cultural attitudes about sexual minorities (e.g., Meyer, 2003). However, cognitive processes can impact members of stigmatized groups without internalization (Biernat & Deaux, 2012). In our studies, LGB individuals reported no difficulty in calling diverse couples to mind, but gay-specific love was closer to the default concept than lesbian-specific love for lesbian and gay participants. LGB individuals' concepts may now

be affected by a 'homonormative' ideology resulting from impactful resistance to cultural heterosexism that has centred the identities of more privileged LGB subgroups of people (e.g., white middle-class men; Duggan, 2002). This interpretation is consistent with Petsko and Bodenhausen's (2019) findings that cultural defaulting resulted in some social groups being harder to bring to mind as members of social categories than others. Both media analyses and related studies of category norm representations suggest that gay male couples may be better represented than lesbian couples in understandings of marriage and divorce (Hegarty *et al*., 2020).

It is important to note the modest sample sizes in some studies here which suggest the need for replication and extension of this work. To our knowledge, these studies are the first to compare the overlap between default and more specific prototypes of an emotion concept, and we recruited in anticipation of observing medium size effects (Cohen, 1992). Further, like many studies that study heterosexism, participants were largely drawn from the UK and USA, where attitudes towards sexual minorities have improved in recent decades (Morrison & Morrison, 2002). Also, the majority of our sample self-identified as Caucasian and female, which precluded analysis of gender or ethnicity effects. Studies of heterosexism among men in less-liberal national contexts may more appropriately address other levels of analysis than individual cognition (Bartoş *et al*., 2014; West, 2018). Although our studies were conducted in a more liberal context, political views can still have an influence on a more individual level. Further research could also benefit from examining political orientation prior to questions on sexual orientation groups. Conservatives may feel more threatened by imagining same-sex behaviours (Mooijman & Stern, 2016) and find taking the perspective of same-gender love particularly difficult. This could explain the high drop-out rates in Studies 1 and 3. We also need to be cautious of the generalizability of our sample in Study 2. Following the advice of Herek et al. (1991), we used a variety of recruitment strategies; however, our results are based on opportunity samples of those LGB individuals who engage with universities and Prolific academic and should not be generalized to all LGB individuals.

Much research on romantic relationships makes normative assumptions about those relationship forms, including the assumption that romantic love occurs first and foremost in heterosexual contexts (Thorne, *et al*., 2019). We argue that research on prototypes of love, such as the work presented here, allows psychologists to examine empirically the gap between existing conceptualizations of love in the literature and the conceptualizations of lay individuals (Kelley, 1992). Other default characteristics or relationships, such as monogamous relationships, 'love marriages,' or age-discordant relationships could be analysed using a similar approach. In these cases, prototype research can advance understanding by moving such taken-for-granted *default* features out of the background and examining the process of defaulting itself.

Limitations notwithstanding, the present findings have implications for understanding and addressing the consequences of cultural heterosexism. As cultural heterosexism influences category accessibility, it may well be the case that heterosexuality, like Whiteness, is associated with some overarching national groups in implicit representations (cf. Devos & Banaji, 2005). Our finding that activating a superordinate category impacts subsequent sexual orientation-specific categorization implies that presenting same-gender couples as general examples of romantic love could be beneficial (see Dasgupta & Greenwald, 2001). Further research should also examine the impact of activating non-typical same-gender couples on attitudes via cognitive processes such as the experience of disfluency and surprise (West & Bruckmüller, 2013). In sum, as some societies approach legal equality for same-gender couples, our research shows how social

cognition can contribute to both the description and explanation of 'hierarchy-enhancing' ideologies (Pratto, 1999) that lag behind. By studying how taken-for-granted concepts (such as love) have developed in such minority groups, we could unlock a wider understanding of these concepts and a deeper understanding of 'equality'.

Acknowledgments

Conflicts of interest

All authors declare no conflict of interest.

Author contributions

Sapphira Thorne, PhD (Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Validation; Visualization; Writing – original draft; Writing – review & editing) Peter Hegarty (Conceptualization; Data curation; Investigation; Methodology; Project administration; Resources; Supervision; Validation; Writing – original draft; Writing – review & editing) Erica Hepper (Conceptualization; Investigation; Methodology; Project administration; Resources; Supervision; Validation; Writing – original draft; Writing – review & editing)

Data availability statement

The data that support the findings of this study are openly available in OSF at http://doi.org/10.17605/OSF.IO/52ZWN.

References

Anderlini-D'Onofrio, S., & Alexander, J. (2009). Introduction to the special issue: Bisexuality and queer theory: Intersections, diversions, and connections. *Journal of Bisexuality*, *9*, 197–212. https://doi.org/10.1080/15299710903316489

Ansara, Y. G., & Hegarty, P. (2012). Cisgenderism in psychology: Pathologising and misgendering children from 1999 to 2008. *Psychology & Sexuality*, *3*, 137–160. https://doi.org/10.1080/19419899.2011.576696

Bailey, A. H., LaFrance, M., & Dovidio, J. F. (2019). Is man the measure of all things? A social cognitive account of androcentrism. *Personality and Social Psychology Review*, *23*, 307–331. https://doi.org/10.1177/1088868318782848

Bartoş, S. E., Berger, I., & Hegarty, P. (2014). Interventions to reduce sexual prejudice: A study-space analysis and meta-analytic review. *The Journal of Sex Research*, *51*, 363–382. https://doi.org/10.1080/00224499.2013.871625

Bell, D., & Binnie, J. (2000). *The sexual citizen: Queer politics and beyond*. Cambridge, UK: Polity.

Biernat, M., & Deaux, K. (2012). 22 A history of social psychological research on gender. In A. W. Kruglanski & W. Stroebe (Eds.), *Handbook of the history of social psychology* (pp. 475–498). New York, NY: Psychology Press.

Bodenhausen, G. V., & Peery, D. (2009). Social categorization and stereotyping in vivo: The VUCA challenge. *Social and Personality Psychology Compass*, *3*, 133–151. https://doi.org/10.1111/j.1751-9004.2009.00167.x

Bruckmüller, S., Hegarty, P., Teigen, K. H., Böhm, G., & Luminet, O. (2017). When do past events require explanation? Insights from social psychology. *Memory Studies*, *10*, 261–273. https://doi.org/10.1177/1750698017701607

Butler, J. (1990). *Gender trouble: Feminism and the subversion of identity*. London, UK: Routledge.

Cass, V. C. (1979). Homosexual identity formation: A theoretical model. *Journal of Homosexuality*, *4*, 219–235. https://doi.org/10.1300/J082v04n03_01

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*, 155–159. https://doi.org/10.1037/0033-2909.112.1.155

Dasgupta, N., & Greenwald, A. G. (2001). On the malleability of automatic attitudes: Combating automatic prejudice with images of admired and disliked individuals. *Journal of Personality and Social Psychology*, *81*, 800–814. https://doi.org/10.1037/0022-3514.81.5.800

de Lauretis, T. (1991). Queer theory, lesbian and gay studies: An introduction. *Differences: A Journal of Feminist Cultural Studies*, *3*, iii–xviii.

Devos, T., & Banaji, M. R. (2005). American=white? *Journal of Personality and Social Psychology*, *88*, 447–466. https://doi.org/10.1037/0022-3514.88.3.447

Duggan, L. (2002). The new homonormativity: The sexual politics of neoliberalism. In R. Castronovo & D. D. Nelson (Eds.), *Materializing democracy: Toward a revitalized cultural politics* (pp. 175–194). Durham, NC: Duke University Press.

Fehr, B. (1988). Prototype analysis of the concepts of love and commitment. *Journal of Personality and Social Psychology*, *55*, 557–579. https://doi.org/10.1037/0022-3514.55.4.557

Fehr, B., & Sprecher, S. (2009). Prototype analysis of the concept of compassionate love. *Personal Relationships*, *16*, 343–364. https://doi.org/10.1111/j.1475-6811.2009.01227.x

Fitness, J., & Fletcher, G. J. (1993). Love, hate, anger, and jealousy in close relationships: A prototype and cognitive appraisal analysis. *Journal of Personality and Social Psychology*, *65*, 942–958. https://doi.org/10.1037/0022-3514.65.5.942

Glick, P., & Fiske, S. T. (1996). The ambivalent sexism inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology*, *70*, 491–512. https://doi.org/10.1037/0022-3514.70.3.491

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*, 197–216. https://doi.org/10.1037/0022-3514.85.2.197

Halperin, D. M. (1997). *Saint Foucault: Towards a gay hagiography*. Oxford, UK: Oxford Paperbacks.

Hassebrauck, M. (1997). Cognitions of relationship quality: A prototype analysis of their structure and consequences. *Personal Relationships*, *4*, 163–185. https://doi.org/10.1111/j.1475-6811.1997.tb00137.x

Hegarty, P. (2017). On the failure to notice that White people are White: Generating and testing hypotheses in the celebrity guessing game. *Journal of Experimental Psychology: General*, *146*, 41–62. https://doi.org/10.1037/xge0000243

Hegarty, P., & Bruckmüller, S. (2013). Asymmetric explanations of group differences: Experimental evidence of Foucault's disciplinary power. *Social and Personality Psychology Compass*, 7, 176–186. https://doi.org/10.1111/spc3.12017

Hegarty, P., & Pratto, F. (2001). The effects of social category norms and stereotypes on explanations for intergroup differences. *Journal of Personality and Social Psychology*, *8*, 723–735. https://doi.org/10.1037/0022-3514.80.5.723

Hegarty, P., Szczerba, A., & Skelton, R. (2020). How has cultural heterosexism affected thinking about divorce? Asymmetric framing of same-gender and mixed-gender divorces in news media and in minds. *Journal of Homosexuality*, *67*, 1118–1134. https://doi.org/10.1080/00918369. 2019.1603495

Hemmings, C., & Blumenfeld, W. J. (1996). Reading "Monosexual". *Journal of Gay, Lesbian, and Bisexual Identity*, *1*, 311–321. https://doi.org/10.1007/BF03372245

Hepper, E. G., Ritchie, T. D., Sedikides, C., & Wildschut, T. (2012). Odyssey's end: Lay conceptions of nostalgia reflect its original Homeric meaning. *Emotion*, *12*, 102–119. https://doi.org/10. 1037/a0025167

Herek, G. M. (2007). Confronting sexual stigma and prejudice: Theory and practice. *Journal of Social Issues*, *63*, 905–925. https://doi.org/10.1111/j.1540-4560.2007.00544.x

Herek, G. M., Kimmel, D. C., Amaro, H., & Melton, G. B. (1991). Avoiding heterosexist bias in psychological research. *American Psychologist*, *44*, 957–963. https://doi.org/10.1037/0003-066X.46.9.957.

Herr, P. M., Sherman, S. J., & Fazio, R. H. (1983). On the consequences of priming: Assimilation and contrast effects. *Journal of Experimental Social Psychology*, *19*, 323–340. https://doi.org/10. 1016/0022-1031(83)90026-4

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). New York, NY: The Guilford Press.

Johnson, K. (2015). *Sexuality: A psychosocial manifesto*. Cambridge, UK: John Wiley & Sons.

Johnson, K. L., McKay, L. S., & Pollick, F. E. (2011). He throws like a girl (but only when he's sad): Emotion affects sex-decoding of biological motion displays. *Cognition*, *119*, 265–280. https://d oi.org/10.1016/j.cognition.2011.01.016

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review*, *93*, 136–153. https://doi.org/10.1037/0033-295X.93.2.136

Kelley, H. H. (1992). Common-sense psychology and scientific psychology. *Annual Review of Psychology*, *43*, 1–23. https://doi.org/10.1146/annurev.ps.43.020192.000245

Kitzinger, C. (2005). Heteronormativity in action: Reproducing the heterosexual nuclear family in after-hours medical calls. *Social Problems*, *52*, 477–498. https://doi.org/10.1525/sp.2005.52.4. 477

Marchia, J., & Sommer, J. M. (2019). (Re) defining heteronormativity. *Sexualities*, *22*, 267–295. https://doi.org/10.1177/1363460717741801

McIntosh, P. (1988). *White privilege and male privilege: A personal account of coming to see correspondences through work in women's studies*. Retrieved from http://www.nymbp.org/ reference/WhitePrivilege.

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, *129*, 674–697. https://doi.org/10.1037/0033-2909.129.5.674

Meyer, I. H., & Wilson, P. A. (2009). Sampling lesbian, gay, and bisexual populations. *Journal of Counseling Psychology*, *56*, 23–31. https://doi.org/10.1037/a0014587

Minton, H. L. (1997). Queer theory: Historical roots and implications for psychology. *Theory & Psychology*, *7*, 337–353. https://doi.org/10.1177/0959354397073003

Mooijman, M., & Stern, C. (2016). When perspective taking creates a motivational threat: The case of conservatism, same-sex sexual behavior, and anti-gay attitudes. *Personality and Social Psychology Bulletin*, *42*, 738–754. https://doi.org/10.1177/0146167216636633

Morrison, M. A., & Morrison, T. G. (2002). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality*, *43*, 15–37. https://d oi.org/10.1300/J082v43n02_02

Mummendey, A., & Wenzel, M. (1999). Social discrimination and tolerance in intergroup relations: Reactions to intergroup difference. *Personality and Social Psychology Review*, *3*, 158–174. https://doi.org/10.1207/s15327957pspr0302_4

Petsko, C. D., & Bodenhausen, G. V. (2019). Racial stereotyping of gay men: Can a minority sexual orientation erase race*? Journal of Experimental Social Psychology*, *83*, 37–54. https://doi.org/10.1016/j.jesp.2019.03.002

Pratto, F. (1999). The puzzle of continuing group inequality: Piecing together psychological, social, and cultural forces in social dominance theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, Vol. *31* (pp. 191–263). New York, NY: Academic Press.

Regan, P. C., Kocan, E. R., & Whitlock, T. (1998). Ain't love grand! A prototype analysis of the concept of romantic love. *Journal of Social and Personal Relationships*, *15*, 411–420. https://doi.org/10.1177/0265407598153006

Reynolds, D. J., Garnham, A., & Oakhill, J. (2006). Evidence of immediate activation of gender information from a social role name. *The Quarterly Journal of Experimental Psychology*, *59*, 886–903. https://doi.org/10.1080/02724980543000088

Rosch, E. (1973). On the internal structure of perceptual and semantic categories. In T. E. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 111–144). New York, NY: Academic Press.

Rosch, E. (1975). Cognitive representations of semantic categories. *Journal of Experimental Psychology: General*, *104*, 192–233. https://doi.org/10.1037/0096-3445.104.3.192

Rosch, E. (1977). Human categorization. In N. Warren (Ed.), *Studies in cross-cultural psychology (volume 1)* (pp. 1–72). New York, NY: Academic Press.

Rosch, E., & Mervis, C. B. (1975). Family resemblances: Studies in the internal structure of categories. *Cognitive Psychology*, *7*, 573–605. https://doi.org/10.1016/0010-0285(75)90024-9

Sedgwick, E. K. (2008). *Epistemology of the closet*. Berkeley, CA: University of California Press.

Seidman, S. (1991). Identity and politics in a "postmodern" gay culture: Some historical and conceptual notes. In M. Warner (Ed.), *Fear of a queer planet: Queer politics and social theory* (pp. 105–142). Minneapolis, MN: University of Minnesota Press.

Thorne, S. (2018). *Queer concepts of romantic love: Uncovering a heteronormative bias* (Unpublished doctoral dissertation). UK: University of Surrey.

Thorne, S. R., Hegarty, P., & Hepper, E. G. (2019). Equality in theory: From a heteronormative to an inclusive psychology of romantic love. *Theory & Psychology*, *29*, 240–257. https://doi.org/10.1177/0959354319826725

Turner, W. B. (2000). *A genealogy of queer theory*, Vol. *12*. Philadelphia, PA: Temple University Press.

Warner, M. (Ed.). (1993). *Fear of a queer planet*. Minneapolis, MN: University of Minnesota Press.

West, K. (2018). Understanding and reducing sexual prejudice in Jamaica: Theoretical and practical insights from a severely anti-gay society. *The Journal of Sex Research*, *55*, 472–485. https://doi.org/10.1080/00224499.2017.1416055

West, K., & Bruckmüller, S. (2013). Nice and easy does it: How perceptual fluency moderates the effectiveness of imagined contact. *Journal of Experimental Social Psychology*, *49*, 254–262. https://doi.org/10.1016/j.jesp.2012.11.007

Supporting Information

The following supporting information may be found in the online edition of the article:

Appendix A. Metacognitive and Demographic Items.
Appendix B. All features of romantic love generated by heterosexual participants in order of total frequency (Study 1).
Appendix C. All features of romantic love generated by non-heterosexual participants in order of total frequency (Study 2).