

Beyond Generalized Sexual Prejudice: Need for Closure Predicts Negative Attitudes Toward  
Bisexual People Relative to Gay/Lesbian People

### Abstract

Increasing evidence suggests that bisexual people are sometimes evaluated more negatively than heterosexual and gay/lesbian people. A common theoretical account for this discrepancy argues that bisexuality is perceived by some as introducing ambiguity into a binary model of sexuality. The present brief report tests a single key prediction of this theory, that evaluations of bisexual people have a unique relationship with Need for Closure (NFC), a dispositional preference for simple ways of structuring information. Participants ( $n=3406$ ) were heterosexual medical students from a stratified random sample of 49 U.S. medical schools. As in prior research, bisexual targets were evaluated slightly more negatively than gay/lesbian targets overall. More importantly for the present investigation, higher levels of NFC predicted negative evaluations of bisexual people after accounting for negative evaluations of gay/lesbian people, and higher levels of NFC also predicted an explicit evaluative preference for gay/lesbian people over bisexual people. These results suggest that differences in evaluations of sexual minority groups partially reflect different psychological processes, and that NFC may have a special relevance for bisexual targets even beyond its general association with prejudice. The practical value of testing this theory on new physicians is also discussed.

*Keywords:* bisexuality, Need for Closure, prejudice, sexual orientation

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Increasing evidence suggests that bisexual people are evaluated more negatively, on average, than heterosexual and gay/lesbian people (Burke & LaFrance, 2016; Herek, 2002). The present research investigated the hypothesis that a dispositional preference for simple, discrete categories may be one reason why some people evaluate bisexual people more negatively than gay/lesbian people despite both being stigmatized minorities. This prediction abounds in the literature on bisexuality but heretofore lacks clear empirical support (Mohr & Rochlen, 1999; Rust, 2000; Worthen, 2013).

One of the tasks of living in a complex social environment is to make sense of a wealth of information, and people differ in the extent to which they seek quick answers and avoid changing those answers. Specifically, Need for Closure (NFC; Webster & Kruglanski, 1994) reflects a motivated tendency to structure information simply, avoid ambiguous mental representations, and maintain established patterns of thinking even in the face of new information (Kruglanski et al., 1997; Neuberg, Judice, & West, 1997). NFC helps explain some discomfort with situations and people that seem to deviate from expectations and norms, and as a result, it is associated with negative attitudes toward a wide variety of marginalized groups (Roets & Van Hiel, 2011), including gay/lesbian people (Soenens, Duriez, & Goossens, 2005). In fact, in line with Allport's (1954) assertion that prejudice reflects a basic cognitive tendency to think in simple terms, it has been argued that NFC is a basic motivational feature underlying prejudice generally, regardless of the target group (Hodson & Dhont, 2015; Roets & Van Hiel, 2011). By this line of reasoning, NFC predicts generalized prejudice because it implies a desire for clear distinctions between social categories, a preference for a predictable social order, and a tendency to listen to

established authorities when they provide clear rules and expectations (Hodson & Dhont, 2015; Roets & Van Hiel, 2011).

However, beyond its association with generalized prejudice, NFC may predict especially negative reactions to groups that are seen as “complicating” a system of social categorization by adding unwanted categories. We test the hypothesis that, because bisexuality challenges a conventional binary system of sexual orientation (Worthen, 2013), people high in NFC will evaluate bisexual people especially negatively, not only compared to heterosexual people but also compared to gay/lesbian people. Including gay/lesbian people as a point of comparison for negative evaluations helps distinguish responses to bisexual people from responses to other sexual minorities. Prior research showing a link between NFC and evaluations of bisexual targets (Mohr & Rochlen, 1999) did not include gay/lesbian targets, leaving open the possibility that NFC simply predicts generalized sexual orientation bias.

Some studies on attitudes toward sexual orientation groups have employed a between-subjects manipulation, exposing each participant to only one target group in order to avoid asking participants to make overt comparisons between groups (Burke & LaFrance, 2016). The present research question pertains directly to such overt comparisons, though, so we used a within-subjects design instead: participants evaluated several sexual orientation groups at once on the same measure, in order to capture intentionally expressed preferences for some groups over others. We predicted that, among heterosexual participants, NFC would be associated with negative evaluations of both gay/lesbian and bisexual people. However, we anticipated that NFC would also explain unique variance in evaluations of bisexual people even accounting for evaluations of gay/lesbian people, such that higher levels of NFC would be associated with particularly negative evaluations of bisexual people relative to gay/lesbian people.

As a supplementary test of the specificity of our reasoning about bisexuality and NFC, we predicted that NFC would predict negative evaluations of bisexual people even accounting for three other individual differences available in the dataset, political conservatism, Social Dominance Orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994), and dispositional perspective taking (Davis, 1983). All three provide examples of constructs related to generalized prejudice. Political conservatism is a well-established predictor of higher levels of prejudice (Jost, Federico, & Napier, 2009), including sexual prejudice, in part because sexual minorities are sometimes viewed as groups pushing for social change (Herek, 2000, 2002; Stephan, Ybarra, & Morrison, 2009). SDO captures a chronic, ideological preference for inequality among social groups (Pratto et al., 1994). It predicts higher levels of prejudice against low-status social groups because people high in SDO prefer to maintain hierarchies (McFarland, 2010; Pratto et al., 1994). Perspective taking is a cognitive form of empathy marked by efforts to understand the experiences of other people and groups, and it often results in lower levels of prejudice because it provides an avenue for people to appreciate the concerns of low-status groups (McFarland, 2010; Todd, Bodenhausen, Richeson, & Galinsky, 2011). Because conservatism, SDO, and perspective taking are examples of explanatory factors in generalized prejudice, including them presents a test of the idea that there is a special relationship between NFC and attitudes toward bisexual people. In other words, if NFC relates specifically to a preference for simple sets of social categories with as few groups as possible and clear distinctions between groups, then NFC should predict negative evaluation of bisexual people over and above these three more general predictors of prejudice.

We tested our predictions in a nationally representative sample of heterosexual medical students, shortly before they became physicians. Although it is not essential to our theory, this

method has practical value because physician biases contribute to unequal medical care disadvantaging sexual minorities including bisexual people (Institute of Medicine, 2011).

### **Method**

Participants ( $n=3406$ ) were medical students from a stratified random sample of 49 U.S. medical schools in the Medical Student Cognitive Habits and Growth Evaluation (CHANGE) Study (van Ryn et al., 2014, 2015). The present report uses data from the students' fourth year of training (Spring 2014), because this is the only timepoint so far that has measured evaluations of bisexual people.

### **Sample**

In the first stage of sampling, we stratified all MD-granting U.S. medical schools into 11 strata defined by their geographic region and public/private status. Schools were randomly sampled from each stratum in roughly the same proportion (43%) using a proportional to (first-year class) size sampling method (Sarndal, Swensson, & Wretman, 1992). In the second stage of sampling, we sent recruitment materials to the 5823 first-year students at these 49 schools whose e-mail or mailing address we were able to obtain. The baseline response rate was 81% ( $N=4732$ ). In 2014, we invited all baseline participants to complete the followup measures, and 3959 (84%) responded. Details about the sampling procedure can be found in other reports (e.g., Burke et al., 2015; Phelan, Puhl, et al., 2015; Przedworski et al., 2015; van Ryn et al., 2014, 2015).

In line with our focus on new medical practitioners, and for consistency with other published reports on the CHANGE sample (e.g., van Ryn et al., 2015), we excluded participants who had left medical school or delayed their training by more than one year ( $n=203$ ). Also, because we were interested in heterosexual people's bias against sexual minorities, we excluded 259 participants who identified themselves as non-heterosexual at either timepoint and 91

participants who declined to specify their sexual orientation. We excluded an additional 42 participants for declining to respond to some of our items of interest, leaving a sample size of 3364. Of these, 1699 were male and 1665 were female. Most ( $n=2078$ ) were White; 709 were Asian, 144 were Black, 136 were Latino/a, and 297 indicated more than one of the aforementioned identities or indicated another racial or ethnic identity. The approximate mean age was 26.80 ( $SD=2.49$ ).

## Measures

The present report focuses on a subset of items from a longer web-based survey instrument, which has been described in detail elsewhere (e.g., Phelan, Burgess, et al., 2015; van Ryn et al., 2014, 2015).

**Attitudes toward sexual orientation groups.** In line with our within-subjects design, each participant evaluated all of the groups of interest. Participants responded to several feeling thermometers measuring self-reported attitudes toward various groups (see Alwin, 1997; Kinder & Drake, 2009). The response scales ranged from 0 (“very cold or unfavorable”) to 100 (“very warm or favorable”). The target groups of interest for the present report were “bisexual people,” “lesbians,” “gay men,” “heterosexual women,” and “heterosexual men.” For some models predicting evaluations of gay/lesbian people, we averaged the ratings of “lesbians” and “gay men,” which were highly correlated,  $r(3362)=.92, p<.001$ .

**Need for Closure.** Due to concerns about participant fatigue, we administered six items from the Need for Closure scale (NFC;  $\alpha=.87, M=4.71, SD=1.16$ ; Roets & Van Hiel, 2007; Webster & Kruglanski, 1994). Participants responded on 7-point rating scales to the following items: “I don’t like situations that are uncertain”; “I dislike it when a person’s statement could mean many different things”; “I don’t like to go into a situation without knowing what I can

expect from it”; “I enjoy the uncertainty of going into a new situation without knowing what might happen” (reverse-coded); “I feel uncomfortable when someone’s meaning or intention is unclear to me”; and “I dislike unpredictable situations.” The resulting NFC score ranged from 1 to 7, with higher numbers indicating greater NFC, and was used in its raw form in all analysis procedures.

**Political conservatism.** Participants responded to a single item designed to capture their political orientation, “How do you characterize your political identification?” The response options were “Very Liberal,” “Liberal,” “Moderate,” “Conservative,” and “Very Conservative.” We defined political conservatism by assigning these responses numeric values ranging from 1 (very liberal) to 5 (very conservative).

**Social Dominance Orientation.** Participants responded to six items from the Social Dominance Orientation (SDO) scale ( $\alpha=.825$ ; Pratto et al., 1994), including “Inferior groups should stay in their place” and “Group equality should be our ideal” (reverse-coded). Items had seven-point response scales and higher values indicate higher levels of SDO.

**Perspective Taking.** Participants responded to six items from the Perspective Taking subscale of the Interpersonal Reactivity Index ( $\alpha=.774$ ; Davis, 1983), including “I sometimes try to understand my friends better by imagining how things look from their perspective.” Items had seven-point response scales and higher values indicate higher levels of perspective taking.

## Results

Overall mean differences in ratings among the target groups were not of primary interest, but we report them for context. A repeated-measures Analysis of Variance (ANOVA) with a Greenhouse-Geisser correction revealed a significant effect of target group on feeling thermometer evaluations,  $F(2.02, 6785.97)=455.96, p<.001, \eta^2=.12$ . Bisexual people ( $M=77.33$ ,



$SD=23.60$ ) were rated most negatively, followed by lesbians ( $M=78.29$ ,  $SD=22.32$ ), gay men ( $M=78.94$ ,  $SD=22.60$ ), heterosexual men ( $M=84.39$ ,  $SD=19.26$ ), and heterosexual women ( $M=85.79$ ,  $SD=18.56$ ). The differences among the target group means were small, but all the corresponding paired  $t$ -tests were statistically significant,  $t(3363)>4.11$ ,  $p<.001$ .<sup>1</sup> These differences are consistent with some previous research (e.g., Burke & LaFrance, 2016), but the core predictions of the present report depend on associations with NFC, not overall mean differences.

### **Primary Modeling Strategy**

To test the hypothesized effect of NFC, we constructed linear mixed models predicting the feeling thermometer evaluation of bisexual people using IBM SPSS Statistics 21. Each observation represented one individual student, and NFC was the main predictor of interest. Each model included stratum as a covariate (11 sampling strata defined *a priori* by region of the country and public/private school status) and estimated a random intercept by school (49 schools; no other random effects) in order to account for the defining elements of the sampling strategy. All mixed models in this paper with random intercepts by school had intraclass correlation coefficients less than .01, and omitting the random intercepts did not meaningfully alter the results. However, we report the results using this modeling strategy because it explicitly accounts for the sampling design and because it was determined *a priori* and used for the previous publications modeling relationships between variables in this dataset (e.g., van Ryn et al., 2015).

For each regression slope of interest, we report the unstandardized slope, standard error,  $p$ -value, 95% confidence interval for the unstandardized slope, and standardized slope. Standardized slopes (indicated in the body text using the letter  $\beta$ ) were computed by centering

and standardizing the predictors and the response variable. They represent the expected standard deviation change in the response for each standard deviation change in the corresponding predictor.

### **NFC and Evaluation of Bisexual Targets**

Full details about the models predicting evaluation of bisexual targets on the basis of NFC can be found in Table 1. Our central prediction was that NFC would predict negative evaluation of bisexual people, and the three models shown in Table 1 demonstrated the anticipated relationship under three increasingly stringent conditions. In summary, Model 1 showed that participants higher in NFC displayed more negative evaluations of bisexual people. This effect remained significant in Model 2, which accounted for evaluations of heterosexual people, a relevant socially advantaged comparison group. Most critically, Model 3 tested the distinctive explanatory value of NFC over and above evaluations of gay men and lesbians, a relevant socially disadvantaged comparison group. In line with our main prediction, NFC remained a significant predictor of negative evaluations of bisexual people even when the feeling thermometer evaluations of gay men and lesbians were included in the model. We fit a supplementary model using the composite feeling thermometer score for gay/lesbian people rather than the two individual feeling thermometers as predictors. In this model, the effect of NFC on evaluations of bisexual people remained significant,  $b=-0.49$ ,  $SE=0.16$ ,  $p=.001$ ,  $95\%CI=[-0.80, -0.19]$ ,  $r=-.055$ .

Table 1

*Need for Closure Predicts Evaluation of Bisexual People Relative to Heterosexual People and Gay/Lesbian People*

	Model 1 (AIC=30752)					Model 2 (AIC=28387)					Model 3 (AIC=25265)				
	Slope	SE	p-value	95% CI	EffectSize <sup>a</sup>	Slope	SE	p-value	95% CI	EffectSize <sup>a</sup>	Slope	SE	p-value	95% CI	EffectSize <sup>a</sup>
Need for Closure	-0.95	0.35	.007	-1.64, -0.27	-0.047	-1.16	0.25	<.001	-1.65, -0.68	-0.082	-0.44	0.15	.004	-0.75, -0.14	-0.050
Evaluation of Heterosexual Men						0.71	0.04	<.001	0.63, 0.79	0.285	0.19	0.03	<.001	0.14, 0.24	0.121
Evaluation of Heterosexual Women						0.18	0.04	<.001	0.10, 0.26	0.073	0.01	0.03	.60	-0.04, 0.07	0.009
Evaluation of Gay Men											0.28	0.02	<.001	0.24, 0.32	0.233
Evaluation of Lesbians											0.55	0.02	<.001	0.51, 0.59	0.418

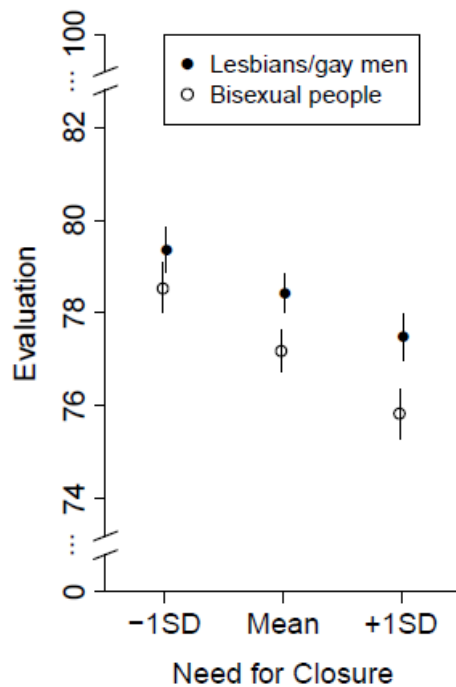
*Note.* Each model reported is a linear mixed model predicting the feeling thermometer evaluation of bisexual people. In addition to the predictors listed, all models include the effect of stratum and a random intercept by school.

<sup>a</sup> The effect size estimates reported (indicated in the body text using the letter *r*) were computed by converting *t* to *r* using  $r^2 = t^2 / (t^2 + df)$  (Kashdan & Steger, 2006).

### NFC and Evaluation of Gay/Lesbian Targets

To further establish that NFC had particular relevance for bisexual targets, we examined an additional set of models using NFC to predict the composite measure of evaluations of gay/lesbian people, otherwise mirroring the models described above (including the random intercept by school and stratum as a covariate). Consistent with prior work, NFC was related to negative evaluations of gay/lesbian people,  $b=-0.62$ ,  $SE=0.33$ ,  $p=.059$ ,  $95\%CI=[-1.26, 0.02]$ ,  $r=-.033$ , even accounting for evaluations of heterosexual people,  $b=-0.81$ ,  $SE=0.23$ ,  $p<.001$ ,  $95\%CI=[-1.27, -0.36]$ ,  $r=-.061$ . However, in line with our prediction about its special relevance to bisexual targets, NFC was unrelated to evaluations of gay/lesbian people once evaluations of bisexual people were included in the model,  $b=0.04$ ,  $SE=0.15$ ,  $p=.80$ ,  $95\%CI=[-0.25, 0.32]$ ,  $r=.004$ . We repeated this process for models predicting the separate feeling thermometer ratings of lesbians and gay men rather than the composite; in these models, the effect of NFC accounting for evaluations of bisexual people remained small and nonsignificant; for lesbians,  $b=-0.12$ ,  $SE=0.15$ ,  $p=.42$ ,  $95\%CI=[-0.42, 0.18]$ ,  $r=-.014$ ; for gay men,  $b=0.20$ ,  $SE=0.17$ ,  $p=.25$ ,  $95\%CI=[-0.14, 0.53]$ ,  $r=.020$ .

For a graphical illustration of the relationship between NFC and evaluations of bisexual and gay/lesbian targets, see Figure 1.



*Figure 1.* Estimated evaluation of lesbians/gay men and of bisexual people at 1 SD below the mean (3.55), the mean (4.71), and 1 SD above the mean (5.87) of Need for Closure. Error bars represent 1 SE. This figure plots fitted values from the model predicting evaluations of bisexual people accounting for evaluations of heterosexual men and women (Table 1, Model 2) as well as fitted values from the model predicting evaluations of gay/lesbian people accounting for the same covariates. All values are estimated at mean evaluations of heterosexual men and women.

### **Comparison Between Bisexual and Gay/Lesbian Targets**

The preceding models demonstrate that NFC predicts attitudes toward bisexual people beyond the variability accounted for by attitudes toward gay/lesbian people, but they do not address the specific act of rating bisexual people more negatively than gay/lesbian people, nor do they compare the relative sizes of NFC's associations with attitudes toward bisexual people and attitudes toward gay/lesbian people. To test our additional hypothesis that high levels of NFC would be more strongly associated with negative evaluation of bisexual people than with negative evaluation of gay/lesbian people, we fit an additional linear mixed model predicting the feeling thermometer ratings of bisexual and gay/lesbian targets as a single outcome, with the target group (bisexual=0; gay/lesbian=1) included as a predictor along with NFC and their interaction. Because there were two observations per participant (one for each target group), this model estimated a random intercept by participant nested within school. As before, stratum was included as a fixed covariate.<sup>2</sup> Critically, the interaction between NFC and target group was significant,  $b=0.32$ ,  $SE=0.16$ ,  $p=.044$ ,  $95\%CI=[0.01, 0.64]$ ,  $r=.035$ . Specifically, the negative association between NFC and evaluation of bisexual people,  $b=-0.95$ ,  $SE=0.34$ ,  $p=.005$ ,  $95\%CI=[-1.61, -0.28]$ ,  $r=-.049$ , had a steeper slope than the negative association between NFC and evaluation of gay/lesbian people,  $b=-0.62$ ,  $SE=0.34$ ,  $p=.066$ ,  $95\%CI=[-1.29, 0.04]$ ,  $r=-.032$ .

### **Accounting for Conservatism, Perspective Taking, and SDO**

Finally, to examine the hypothesized distinctive effects of NFC beyond other individual-difference predictors of bias, we examined political conservatism, SDO, and perspective taking using the same modeling strategy as above (random intercept by school and stratum as a covariate). Consistent with its role in negative attitudes toward disadvantaged groups, higher political conservatism was related to negative evaluations of both bisexual targets,  $b=-5.94$ ,

$SE=0.45$ ,  $p<.001$ ,  $95\%CI=[-6.82, -5.07]$ ,  $r=-.230$ , and gay/lesbian targets,  $b=-6.18$ ,  $SE=0.41$ ,  $p<.001$ ,  $95\%CI=[-6.99, -5.38]$ ,  $r=-.258$ . However, unlike NFC, political conservatism did not predict evaluation of one sexual minority group over the other (as represented by the interaction between NFC and target group in a model with a random intercept by participant nested within school),  $b=-0.24$ ,  $SE=0.20$ ,  $p=.23$ ,  $95\%CI=[-0.64, 0.16]$ ,  $r=-.021$ .

Similarly, consistent with its role in negative attitudes toward disadvantaged groups, higher SDO was related to negative evaluations of both bisexual targets,  $b=-6.71$ ,  $SE=0.39$ ,  $p<.001$ ,  $95\%CI=[-7.47, -5.94]$ ,  $r=-.285$ , and gay/lesbian targets,  $b=-6.56$ ,  $SE=0.36$ ,  $p<.001$ ,  $95\%CI=[-7.27, -5.85]$ ,  $r=-.300$ . However, unlike NFC, SDO did not predict evaluation of one sexual minority group over the other,  $b=0.12$ ,  $SE=0.19$ ,  $p=.52$ ,  $95\%CI=[-0.25, 0.48]$ ,  $r=.011$ . The results for perspective taking followed the same pattern. Consistent with its role in positive responses to outgroups, higher perspective taking was related to positive evaluations of both bisexual targets,  $b=5.27$ ,  $SE=0.43$ ,  $p<.001$ ,  $95\%CI=[4.42, 6.11]$ ,  $r=.207$ , and gay/lesbian targets,  $b=5.04$ ,  $SE=0.40$ ,  $p<.001$ ,  $95\%CI=[4.25, 5.82]$ ,  $r=.213$ . However, unlike NFC, perspective taking did not predict evaluation of one sexual minority group over the other,  $b=-0.22$ ,  $SE=0.20$ ,  $p=.27$ ,  $95\%CI=[-0.62, 0.17]$ ,  $r=-.019$ .

More importantly, NFC remained a significant predictor of evaluations of bisexual targets even accounting for political conservatism, SDO, perspective taking, and the other feeling thermometers in Table 1, Model 3,  $b=-0.39$ ,  $SE=0.16$ ,  $p=.012$ ,  $95\%CI=[-0.69, -0.09]$ ,  $r=-.044$ . NFC also remained a significantly stronger predictor of evaluation of bisexual targets compared to gay/lesbian targets (as represented by the interaction between NFC and target group in a model with a random intercept by participant nested within school) even accounting for political

conservatism, SDO, perspective taking, and the heterosexual feeling thermometers,  $b=0.33$ ,  $SE=0.16$ ,  $p=.042$ ,  $95\%CI=[0.01, 0.65]$ ,  $r=.035$ .

### **Discussion**

Research on intergroup bias has often focused on social categories occupying traditionally recognized disadvantaged positions (e.g., gay/lesbian people). Studying a range of disadvantaged groups (e.g., bisexual and gay/lesbian people), can help illuminate distinctive factors contributing to specific biases. In the present research, bisexual targets were evaluated more negatively than gay/lesbian targets. More importantly, Need for Closure (NFC) predicted negative evaluations of bisexual people even after accounting for negative evaluations of gay/lesbian people. NFC also predicted the tendency to evaluate bisexual people more negatively than gay/lesbian people. These results suggest that differences in evaluations of sexual minority groups partially reflect different psychological processes. Specifically, NFC may have a special relevance for intermediate groups even beyond its general association with prejudice and related constructs such as political conservatism, Social Dominance Orientation, and Perspective Taking.

Recent evidence suggests that lay views of various intermediate social categories (e.g., biracial, bisexual) may share some key patterns (Sanchez, Pauker, & Young, 2014). Foremost among the proposed explanations is the idea that intermediacy itself may be disconcerting to some perceivers. The fact that NFC distinguished between bisexual and gay/lesbian targets in our sample supports this view, because it connects a dispositional aversion to complexity and ambiguity with negative evaluation of an intermediate social category. This result suggests, but does not prove, that people high in NFC perceived bisexual people's intermediacy as a threat to an otherwise-simple binary model of sexual orientation. We cannot fully rule out the alternative



explanation that NFC predicts negative evaluations of unfamiliar groups, and that bisexual people were less familiar to our participants than gay/lesbian people were. However, given prior work linking NFC to preference for simplicity and established ways of thinking, rather than aversion to novel stimuli more generally (e.g., Jost, Glaser, Kruglanski, & Sulloway, 2003; Onraet, Van Hiel, Roets, & Cornelis, 2011), we view our results as a promising step toward a more complete understanding of attitudes toward intermediate groups. Future research could manipulate exposure to novel groups to disentangle the effects of novelty and intermediacy.

Calling attention to the distinctive processes involved in prejudice against bisexual people (and, perhaps, other intermediate social groups) has implications for prejudice reduction efforts. If NFC reflects discomfort with a social category viewed by some as “unstable” (see Burke & LaFrance, 2016; Mohr & Rochlen, 1999), then its association with negative attitudes toward bisexual people may be diminished by efforts to concretize bisexuality as a category through the use of vivid exemplars or repeated categorization trials. If, instead, NFC reflects a chronic preference for binary systems over sets of three or more categories, interventions might focus more on satisfying this need in another way or reducing it altogether (e.g., by framing sexual orientation as an appealing topic to think deeply about; Webster, 1993).

In our results, Need for Closure explained only a small portion of the variability in attitudes toward bisexual people relative to other target groups. Although this result is consistent with a long-held theoretical prediction about the role of cognitive disposition in evaluating social intermediacy, it should not be taken to fully explain attitudes toward bisexual people. There are a number of complementary accounts of differences in attitudes among sexual orientation target groups, such as differing perceptions of unwanted sexual interest (Pirlott & Neuberg, 2014).

Need for Closure also predicted negative attitudes toward gay and lesbian people, albeit not relative to bisexual people. This result is consistent with the idea that NFC plays a role in sexual orientation bias broadly speaking, in addition to its particular pertinence to bisexuality. To distinguish effects of being viewed as an intermediate social group (e.g., bisexual people) from effects specific to a type of identity (e.g., sexual orientation), researchers could measure attitudes toward multiple intermediate groups in one study (e.g., bisexual people vs. biracial people). Varying other sexuality-related characteristics, such as relationship status, would also be informative. Perhaps people high in NFC would be more comfortable with bisexual people in monogamous relationships than with people in consensually non-monogamous relationships, regardless of sexual orientation.

Limitations of our dataset constrain the detail of our conclusions. We measured explicit evaluations of “bisexual people” without indicating target gender, yet we measured evaluations of “lesbians,” “gay men,” “heterosexual women,” and “heterosexual men” separately. These five items permit us to test our core hypothesis about the relationships with Need for Closure, but they do not permit strong inferences about differences among the target groups, since prior research identifies target gender differences in ratings (e.g., Burke & LaFrance, 2016; Pirlott & Neuberg, 2014). It remains to be determined whether our participants envisioned bisexual men or bisexual women when responding to the item about bisexual people; to fully test these possibilities, future research should incorporate ratings of “bisexual men,” “bisexual women,” and “bisexual people” for comparison. Furthermore, our measure of NFC may have been imprecise as a result of selecting only six items.

We lack direct evidence that the pattern of results we observed among medical students would also emerge in the general population. However, our sample, representative of US medical

students about to enter the workforce as doctors, provides unique practical value because doctors have high status, social influence, and responsibility for public welfare. Understanding bias among future medical professionals facilitates efforts to reduce healthcare disparities (Institute of Medicine, 2011).

Overall, our findings suggest that a chronic cognitive style privileging simple explanations can help explain negative reactions to the growing complexity of categories in the modern social environment.

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## Footnotes

<sup>1</sup> Specifically, bisexual people were rated more negatively than lesbians,  $t(3363)=5.00$ ,  $p<.001$ ,  $d=0.09$ , gay men,  $t(3363)=7.60$ ,  $p<.001$ ,  $d=0.13$ , heterosexual men,  $t(3363)=24.04$ ,  $p<.001$ ,  $d=0.41$ , and heterosexual women,  $t(3363)=27.74$ ,  $p<.001$ ,  $d=0.48$ . Lesbians were rated more negatively than gay men,  $t(3363)=4.12$ ,  $p<.001$ ,  $d=0.07$ , heterosexual men,  $t(3363)=21.25$ ,  $p<.001$ ,  $d=0.37$ , and heterosexual women,  $t(3363)=25.45$ ,  $p<.001$ ,  $d=0.44$ . Gay men were rated more negatively than heterosexual men,  $t(3363)=18.32$ ,  $p<.001$ ,  $d=0.32$ , and heterosexual women,  $t(3363)=22.37$ ,  $p<.001$ ,  $d=0.39$ . Heterosexual men were rated more negatively than heterosexual women,  $t(3363)=11.70$ ,  $p<.001$ ,  $d=0.20$ .

<sup>2</sup> We fit this model using the nlme package for R (nlme version 3.1.125; R version 3.2.5) because it did not converge quickly enough in SPSS, likely because the school variable explains negligible variance. A simpler construction that omitted the school variable (which ran in both R and SPSS) yielded parameter estimates nearly identical to those reported in the main text. We used nlme rather than SPSS for all subsequent models with random intercepts by participant nested within school.