2023

Stereotype threat within the LGBTQ+ community

Chloe Laporte

Stereotype threat within the LGBTQ+ community

Abstract

This study examined stereotype threat for students from the LGBTQ+ community. Stereotype threat can cause negative effects regarding performance and can influence the expression of social behaviors. This project observed differences between LGBTQ+ and non-LGBTQ+ identifying groups who believe the study tests performance stereotypes for LGBTQ+ students (or not), on a quantitative test, as well as for responses about social behaviors. I postulated that LGBTQ+ individuals under threat will perform more poorly on the test, and exhibit more problematic social behaviors. In the current study, some participants were assigned to a control condition and were given a diagnostic test, while others were assigned to the threat condition and were given a pilot test after being threatened. Results showed that the test only demonstrated a main effect of lower performance for all participants when the test was described as diagnostic of performance. Additionally, results showed that members of the LGBTQ+ community exhibited more negative experiences as compared to non-LGBTQ+ identifying individuals regardless of test condition. Past research has shown the serious negative consequences of stereotype threat within other marginalized groups, so administering this study within the LGBTQ+ community strengthens existing research.

Degree Type

Open Access Senior Honors Thesis

Department or School

Psychology

First Advisor

Rusty McIntyre, Ph.D.

Second Advisor

Natalie Dove, Ph.D.

Third Advisor

Ann R. Eisenberg, Ph.D.!

Subject Categories

Psychology

STEREOTYPE THREAT WITHIN THE LGBTQ+ COMMUNITY

By

Chloe Laporte

A Senior Project Submitted to the

Eastern Michigan University

Honors College

In Partial Fulfillment of the Requirements for Graduation

with Departmental Honors in Psychology

Approved in Ypsilanti, MI on April 10, 2023

Project Advisor: Rusty McIntyre, Ph.D.

Departmental Honors Advisor: Rusty McIntyre, Ph.D.

Department Head/School Director: Natalie Dove, Ph.D.

Dean of The Honors College: Ann R. Eisenberg, Ph.D.

Contents

Abstract

This study examined stereotype threat for students from the LGBTQ+ community. Stereotype threat can cause negative effects regarding performance and can influence the expression of social behaviors. This project observed differences between LGBTQ+ and non-LGBTQ+ identifying groups who believe the study tests performance stereotypes for LGBTQ+ students (or not), on a quantitative test, as well as for responses about social behaviors. I postulated that LGBTQ+ individuals under threat will perform more poorly on the test, and exhibit more problematic social behaviors. In the current study, some participants were assigned to a control condition and were given a diagnostic test, while others were assigned to the threat condition and were given a pilot test after being threatened. Results showed that the test only demonstrated a main effect of lower performance for all participants when the test was described as diagnostic of performance. Additionally, results showed that members of the LGBTQ+ community exhibited more negative experiences as compared to non-LGBTQ+ identifying individuals regardless of test condition. Past research has shown the serious negative consequences of stereotype threat within other marginalized groups, so administering this study within the LGBTQ+ community strengthens existing research.

Stereotype Threat Within the LGBTQ+ Community

Why is it that people who get stigmatized may engage in either behaviors to distance themselves from that stigma, or may even engage in more harmful behaviors? Prior work on stereotype threat establishes that when people become aware of group stereotypes (e.g., stigma) that their behaviors and thinking can be affected (Steele, Spencer, & Aronson, 1999). Additionally, other work examining members of the LGBTQ+ shows that these individuals can often experience shame and other negative outcomes, and can actually lead to worse mental and physical health (Scheer et al., 2020). Interestingly, in a study looking at physical cleansing and risk-taking behaviors, Xu et al.(2011) reported that incidental hand-washing can get rid of undesirable traces of the past. These findings suggest that cleansing-type behaviors can be used to psychologically remove elements of the past, which is significant when examining the possible negative effects of stereotype threat among the LGBTQ+ community.

As part of this thesis, this study examined if members of the LGBTQ+ community experience stereotype threat, and if the stigma to the group causes more negative and maladaptive behavioral responses. Specifically, a quantitative examination was administered in order to examine performance differences between the threat and control condition. Additionally, a questionnaire regarding consumer attitudes was conducted in order to examine the presence of possibly negative and maladaptive behavioral responses, as well as self-cleansing or “washing away” types of responses. As consistent with previous research, it is expected that members of the LGBTQ+ community, while under stereotype threat, will perform poorer on a quantitative reasoning examination, as well as exhibit more negative, maladaptive, and self-cleansing behavioral responses.

Stereotype Threat

Stereotype threat is the concept that encompasses how an individual who is put into a negative spotlight regarding a stereotype in which they may fit, can be negatively impacted in ways such as their thinking, behaviors, and performances. Prior research has found that stereotype threat can impact people based on their race, as well as their gender (Steele et al., 1999). Specifically, Aronson et al. (1999) found that when women were given a test that was explained as creating gender differences and stereotype threat was high, women performed significantly worse than equally qualified men. Additionally, Steele and Aronson (1995) conducted a study that looked at the negative stereotype threat Black Americans face in education and found that Black Americans performed poorer on the diagnostic test, which was described as referenced to their verbal ability, as compared to the non-diagnostic test. The amount of research regarding stereotype threat is relatively extensive, but there is a gap when it comes to how this concept affects those based on sexual orientation and gender expression.

In an additional study conducted by Armenta (2010) examined the effects of stereotype threat and the moderating role of ethnic and cultural identification. Specifically, Armenta (2010) found that high-ethnically identified Latinos and Asian Americans performed worse on a math exam when an ethnicity-ethnic stereotype threat was present, while low-ethnically identified individuals were not affected by the threat. These findings by Armenta speak to the consequences of a present stereotype threat regarding part of one's identity, as well as how the level of self-identification can impact how the threat is received. All of this previous work leads to the conclusion that members of the LGBTQ+ community should be no exception to the effects of stereotype threat, and should also exhibit performance detriments when under the threat.

Additionally, the level in which individuals identify with the LGBTQ+ community may have an effect on how they react to the stereotype threat received.

LGBTQ+ Reactions to Stigmatization

Members of the LGBTQ+ community face all forms of discrimination, stigmatization, as well as forms of direct violence, because of their identity. As more countries become more tolerant towards the LGBTQ+ community, there has been an emergence of research on how this mistreatment impacts this community. Kelleher (2009) wanted to examine the connections between minority status within the LGBTQ+ community and health and found that each minority status had a significant association with distress. These findings show that this community faces health related consequences for the discrimination and stigmatization they face. Additionally, work done by Coker et al. (2010) highlights evidence that indicates LGBTQ+ adolescents are at increased risk of various health-related risk behaviors and negative health outcomes as compared to non-LGBTQ+ adolescents. This increased risk of negative health outcomes can be traced partially back into the discrimination and stress these individuals experience on a day to day basis.

There are a series of significant reactions to stigma and prejudice that members of the LGBTQ+ community experience, and these have been documented in previous research. Specifically, in a study conducted by Birkett et al. (2009), they found that individuals who identified as Lesbian, Gay, Bisexual (LGB), or sexually questioning, reported higher levels of bullying, homophobic victimization, as well as other negative outcomes as compared to heterosexual youth. Additionally, Birkett et al. (2009) also found that individuals who were questioning their sexual orientation experienced the most bullying, the most drug use, the most feelings of suicidality and depression, and more truancy as compared to heterosexual or LGB-

identifying individuals. These results suggest that both members of the LGB community as well as those that are questioning their sexuality experience higher instances of negative outcomes in response to the stigma and prejudice they experience within their school environment. Similarly, other researchers have found that the stress of coming to terms with one's sexuality in adolescence in combination with heterosexism and homophobia can put LGB-identifying individuals at high risk for suicidality, depression, drug use, and school problems (Elliot and Kilpatrick 1994; Mufoz-Plaza et al. 2002; Treadway and Yoakam 1992). From existing research, it is clear that members of the LGB community, as well as those questioning their sexuality, experience negative outcomes, as well as exhibit more problematic behaviors in response to the discrimination and prejudice they face due to their identity.

Stereotype threat is a very significant consequence of stigma that affects people of varying demographics, in differing settings, under ranging conditions. There is clear evidence that stereotype threat affects members of certain disadvantaged groups in society, so the same should apply for members of the LGBTQ+ community. Knowing the evidence that shows that members of the LGBTQ+ community suffer severe consequences from the discrimination they face, it is clear that they also will be affected by stereotype threat. Additionally, Steel et al. (1999) have identified that stereotype threat not only affects performance, it can also cause individuals to avoid stigma-related domains or topics, and can even cause those experiencing threat to disidentify, either with the group or the source/domain of the stigma. As such, this study was designed to examine some of these outcomes. I hypothesized that members of the LGBTQ+ community, under the condition of stereotype threat, will perform poorer on diagnostic tests and will exhibit more problematic behavioral responses (i.e., disidentifying) as compared to members

of the LGBTQ+ community in the non-threatening condition or compared to individuals not identifying as LGBTQ+ community members.

Methods

Participants

The study had 132 undergraduate college student participants (47 LGBTQ+ identified, 85 non-LGBTQ identified) complete an online study regarding stereotype threat among the LGBTQ+ community.

Procedure

At the beginning of the study, participants are given one of two prompts, depending on if they are in the threat or non-threat condition. In the threat frame, participants are told they are going to complete a test of qualitative reasoning and a brief summary of consumer attitudes of the typical college student. These participants are then told that prior research has shown that members of the LGBTQ+ community perform poorer on diagnostic tests, and then are instructed to attempt all questions to the best of their ability in under 60 seconds per question. In the non-threat frame, participants are asked to complete a test of qualitative reasoning and a brief summary of consumer attitudes of the typical college student (see also appendix for research materials). The participants are then told that for the quantitative test, the researchers are attempting to establish baseline norms for individuals at Eastern Michigan University. The participants are then instructed to attempt all questions to the best of their ability in under 60 seconds per question.

Quantitative Test

The quantitative test consists of multiple choice questions pulled from a GRE practice guide. For inclusion, these items had to have had an item correct pass rate between 40-60

percent. These multiple choice questions consist of varying topics related to mathematics including probability, finding arithmetic means, ratios, and comparing quantities written in the form of equations. There is a timer that is hidden to participants that was placed on every question page in order to record how long the participants spent on each question.

Consumer Attitudes

In the next section of the study, participants were told that they will be asked questions about their behavior and attitudes towards products, people, and actions. The participants were asked the likelihood that they would buy certain products on a scale of 0 (not at all) to 5 (extremely likely). Some of these products include surface disinfectant, juice, hand sanitizer, soaps, and other cleaning products as well as non-cleaning products. The participants were then asked the likelihood that they would engage in certain activities on a scale of 0 (not at all) to 5 (extremely likely). Some of these activities include going for a run, playing sports, practice mindfulness, and other self-improvement related behaviors. Participants were then asked the likelihood that they would engage in social and sexual activities on a scale of 0 (not at all) to 5 (extremely likely). Some of these activities include going to a social event, engaging in unprotected sex, and other risky behaviors, as well as typical social behaviors.

Study Awareness Check

In this part of the study, participants were asked questions regarding their personal feelings and thoughts and were directed to answer the questions to the best of their knowledge. The participants were first asked if anything stood out to them during the study, they were asked what the study was about, and were then asked if they are aware that members of the LGBTQ+ face stigmatization compared to cisgender/heterosexual individuals. These questions function as

a manipulation check ensuring that participants were aware of the purposes of the study, but they were unaware of the explicit hypothesis of the study.

Identity Scale

In this part of the study, participants were asked questions regarding their feelings surrounding their identity, and were asked to indicate how aware they were of statements on a scale from 0 (not at all) to 5 (extremely likely). These statements relate to feelings surrounding one's identity, which include pride, frustration, connection, and importance. An example of an item from this scale is "I feel strongly about my identity."

Affective reactions (PANAS)

In this section, participants were asked to indicate how strongly they feel in response to 20 items provided on a scale from 1 (not at all) to 5 (extremely). Items provided include both positive and negative affective responses which include sad, excited, angry, and proud.

Demographics

In this section, participants were asked a series of questions regarding their demographics. The participants were first asked to specify their ethnicity and were given five ethnicity choices, as well as the option of "other" and an option not to answer. Participants were then asked to specify their age and were given four age groups ranging from 18 to over 44 as well as an option not to answer. Participants were then asked what gender they identify with and were given the options of "male", "female", "non-binary or third gender" as well as an option not to answer. The participants were then asked if they wish to disclose if they are a part of the LGBTQ+ community and were given the options of "yes", "no" as well as an option not to answer.

Study Awareness Check

In this brief section, participants were asked to identify the content explained in the study. Specifically, the participants were first told that the research was using a measure of quantitative reasoning and were then asked to identify which measure they were given. Additionally, the participants were then asked to identify which groups of individuals the researchers were focusing on and were given four options of populations including the LGBTQ+ community.

Results

In the quantitative part of the study, correct answers were assigned a (1) and all other answers were assigned a (0) and the total for all participants was computed. Participants were asked a question regarding their sexual orientation and were identified as (2) when they did not disclose being part of the LGBTQ+ community, and as (1) when they did identify as being part of the LGBTQ+ community. Reported gender was not examined due to a degree of collinearity to gender reported and identifying as part of the LGBTQ+ community.

Math Score

In order to examine if the test frames impacted the performance on a math test, correct responses from this measure were totaled (out of 16 items). On the math test, although the differences did not reach traditional levels of significance (e.g., $p < .05$), there was a marginal effect for the test frame, $F(1, 127) = 3.06$, $p = .082$. As such, participants who received the diagnostic test frame tended to show lower scores ($M = 3.48$) than did participants who received the control or benign test frame consistent with threat outcomes ($M = 4.39$). There was also no significant main effect for sexual orientation, $F(1, 127) = .007$, $p = .963$. The interaction between sexual orientation and test frame was not significant, $F(1, 127) = .375$, $p = .541$.

Table 1. *Math Score Results for LGBTQ+ and Non-LGBTQ+ Individuals*

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	4.19 (1.71) *27*	3.65 (1.76) *20*
Non-LGBTQ+	4.51 (3.53) *45*	3.40 (2.04) *40*

Note: Standard deviations are in parentheses; n per group are in italics.

Affective reactions (PANAS)

In order to examine if the test frames impacted positive and negative affect, scores on the PANAS were totaled for positive and negative affective reactions. For the negative totals, there was no main effect of the test frame, $F(1, 127) = 1.43$, $p = .234$, but did show a significant main effect for sexual orientation, $F(1, 127) = 5.36$, $p = .022$. That effect occurred because members of the LGBTQ+ community reported more negative experiences ($M = 25.60$) than did non-LGBTQ+ persons ($M = 22.52$). The interaction between sexual orientation and test frame was not significant, $F(1, 127) = 1.018$, $p = .315$.

Additionally, reports for positive affective responses were also analyzed. For these responses, there was no main effect of the test frame, $F(1,127) = .108$, $p = .743$. There was also no significant main effect for sexual orientation, $F(1,127) = .271$, $p = .603$. Additionally, the interaction between sexual orientation and test frame was not significant, $F(1,127) = 0.157$, $p = .693$.

Table 2. *PANAS Score Results for LGBTQ+ and Non-LGBTQ+ Individuals*

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	24.3 (7.00) *27*	27.4 (8.76) *20*
Non-LGBTQ+	22.4 (8.08) *45*	22.7 (7.31) *39*

Descriptive statistics for Positive PANAS Scores

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	29.4 (8.22) *27*	29.3 (10.1) *19*
Non-LGBTQ+	29.6 (7.79) *44*	30.7 (8.73) *39*

Note: Standard deviations are in parentheses; n per group are in italics.

Cleansing Behaviors

In order to examine if the test frames impacted the likelihood to engage in cleansing behaviors, scores on the behavioral questionnaire were totaled for cleaning behaviors. For these behaviors, there was no main effect of the test frame, $F(1, 127) = .285$, $p = .594$. There was also no significant main effect for sexual orientation, $F(1, 127) = .152$, $p = .698$. The interaction between sexual orientation and test frame was not significant, $F(1, 127) = .027$, $p = .870$.

Table 3. *Cleansing Behavior Scale Score Results for LGBTQ+ and Non-LGBTQ+ Individuals*

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	12.2 (4.62) *27*	12.6 (4.57) *20*
Non-LGBTQ+	11.7 (4.97) *45*	12.4 (4.91) *40*

Note: Standard deviations are in parentheses; n per group are in italics.

Risky Behaviors

To examine if the test frames impacted the likelihood to engage in risky behaviors, scores on the behavioral questionnaire were totaled for risky behaviors. For these behaviors, there was no main effect of the test frame, $F(1, 127) = .010$, $p = .921$. There was also no significant main effect for sexual orientation, $F(1, 127) = .010$, $p = .922$. The interaction between sexual orientation and test frame was not significant, $F(1, 127) = .099$, $p = .753$.

Table 5. *Risky Behavior Scale Score Results for LGBTQ+ and Non-LGBTQ+ Individuals*

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	10.1 (6.31) *27*	9.85 (7.03) *20*

Non-LGBTQ+	9.64 (4.89) *45*	10.1 (5.29) *40*

Note: Standard deviations are in parentheses; n per group are in italics.

Social Behaviors

In order to examine if the test frames impacted the likelihood to engage in social behaviors, scores on the behavioral questionnaire were totaled for social behaviors. For these behaviors, there was no main effect of the test frame, $F(1, 127) = 2.24$, $p = .137$. There was also no significant main effect for sexual orientation, $F(1, 127) = 1.00$, $p = .319$. The interaction between sexual orientation and test frame was not significant, $F(1, 127) = 1.10$, $p = .296$.

Table 6. *Social Behavior Scale Score Results for LGBTQ+ and Non-LGBTQ+ Individuals*

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	20.0 (6.12) *27*	16.9 (8.40) *20*
Non-LGBTQ+	20.0 (5.62) *45*	19.4 (7.31) *40*

Note: Standard deviations are in parentheses; n per group are in italics.

Self Improvement

In order to examine if the test frames impacted the likelihood to engage in self-improvement related behaviors, scores on the behavioral questionnaire were totaled for self-

improving behaviors. For these behaviors, there was no main effect of the test frame, $F(1, 127) = .454$, $p = .502$. For sexual orientation, although the differences did not reach traditional levels of significance (e.g., $p < .05$), there was a marginal effect for the test frame, $F(1, 127) = 2.88$, $p = .092$. As such, participants who identified as LGBTQ+ tended to show lower scores (M = 19.7) than did participants who did not identify as LGBTQ+ (M = 22.2). The interaction between sexual orientation and test frame was not significant, $F(1, 127) = 1.92$, $p = .169$.

Table 7

Self-Improvement Behavior Scale Score Results for LGBTQ+ and Non-LGBTQ+ Individuals

	Non-Diagnostic Test	Diagnostic Test
LGBTQ+	21.2 (7.90) *27*	18.2 (8.83) *20*
Non-LGBTQ+	21.7 (8.01) *45*	22.8 (8.12) *40*

Note: Standard deviations are in parentheses; n per group are in italics.

Identity Scale

To examine if the test frames impacted the participants' sense of identity, scores on the identity scale were totaled. For these scores, there was no main effect of the test frame, $F(1, 127) = 1.22$, $p = .272$. There was also no significant main effect for sexual orientation, $F(1, 127) = .830$, $p = .364$. The interaction between sexual orientation and test frame was not significant, $F(1, 127) = .423$, $p = .516$.

Table 8. *Identity Scale Score Results for LGBTQ+ and Non-LGBTQ+ Individuals*

	Non-Diagnostic Test	Diagnostic Test

LGBTQ+	45.6 (6.19) *27*	42.7 (12.1) *20*
Non-LGBTQ+	46.0 (8.24) *45*	45.3 (9.60) *40*

Note: Standard deviations are in parentheses; n per group are in italics.

Study Awareness Check

Unfortunately, this awareness check was not significantly different, however, there were more participants in the diagnostic condition indicating the test was diagnostic ($M = 1.61$) as compared to those in the non-diagnostic (non-threat) condition ($M = 1.55$), $F(1, 133) = .57$, *ns*.

Discussion

Results of this study testing the relationship between stereotype threat among the LGBTQ+ community and performance on quantitative measures as well as behavioral questionnaires yielded two key findings. First, consistent with previous research, members of the LGBTQ+ community reported more negative experiences on the PANAS scale than did non-LGBTQ+ persons (Elliot and Kilpatrick 1994; Mufoz-Plaza et al. 2002; Treadway and Yoakam 1992). This finding is significant because it highlights the disparities between the LGBTQ+ community and non-LGBTQ+ individuals when it comes to negative experiences they endure. Second, individuals given the diagnostic test performed poorer than individuals given the non-diagnostic test. This finding suggests that the diagnostic test was able to produce some threat, even if not specifically threatening to the members of the LGBTQ+ community.

There were several limitations of this study that should be addressed when interpreting the findings presented. First, the quantitative test used in this study was administered online,

which can cause problems when trying to find significant results. Specifically, previous work done by Meade et al.(2010) found that about 10-12% of undergraduate students completing a lengthy survey were found to be careless responders, which was detected by specific items designed to detect carelessness. Additionally, work done by Francavilla et al. (2019) found that a lack of human interaction as well as environmental control were antecedents to careless responses. These findings are significant to the results presented in this study because the quantitative test used was anonymous and administered virtually, which could have led to more instances of careless responding by participants. Instances of careless responses is a reasonable explanation as to why more significant results were not found. Future research should attempt to duplicate this study using in-person and proctored forms of quantitative tests.

Additionally, another possible limitation of this study was that participants could have simply not cared enough to be threatened by the threat condition. Steele and Aronson (2002) found that there are many factors that can impact the degree of stereotype threat a person experiences. Specifically, Steele et al. (2002) state that the strength in which a person experiences stereotype threat is dependent on the meaning of the stereotype involved, as well as the degree to which the individual identifies with the threatened identity. To explain further, if a stereotype holds a more negative meaning, it will serve a more threatening role as compared to a more positively meaning stereotype. Additionally, if someone does not identify with a domain in which a stereotype applies, they will not be threatened as much as if they identified strongly with it.

These previous findings are significant to this study because they provide possible evidence as to why stereotype threat was not observed more in this work. Specifically, participants in this study could either (1) not identify with the LGBTQ+ community, and

therefore not care enough to be threatened or (2) not find the threat to be negative enough to create stereotype threat. Future research should attempt to replicate this study using more participants to include more individuals from the LGBTQ+ community as well as creating a more threatening condition to possibly create more threat and bring about more significant findings.

References

Aronson, J., Lustina, M. J., Good, C., Keough, K., Steele, C. M., and Brown, J. (1999). When white men can't do math: Necessary and sufficient factors in stereotype threat. *Journal of Experimental Social Psychology, 35*, 29–46.

Aronson J., Steele C.M. (1995). Stereotype threat and the intellectual test performance of African Americans. *J Pers Soc Psychol*., *69*(5), 797-811. doi: 10.1037//0022-3514.69.5.797.

Birkett, M., Espelage D., and Koenig, B. (2009). LGB and questioning students in schools: The moderating effects of homophobic bullying and school climate on negative outcomes. *J Youth Adolesc.*, *38*(7), 989-1000. doi: 10.1007/s10964-008-9389-1.

Elliot, M., and Kilpatrick, J. (2001). How to stop bullying: A kidscape training guide. *Kidscape.*

Francavilla, N. M., Meade, A. W., and Young, A. L. (2019). Social interaction and internet-based surveys: Examining the effects of virtual and in-person proctors on careless response. *Applied Psychology: An International Review*, *68*(2), 223–249. https://doi.org/10.1111/apps.12159.

Kelleher, C. (2009). Minority stress and health: Implications for lesbian, gay, bisexual, transgender, and questioning (LGBTQ) young people. *Counseling Psychology Quarterly*, *22*(4), 373-379. doi: 10.1080/09515070903334995

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods, 17*(3), 437–455. https://doi.org/10.1037/a0028085

Mufoz-Plaza, C., Quinn, S. C., and Rounds, K. A. (2002). Lesbian, gay, bisexual and transgender students: Perceived social support in the high school environment. *High School Journal*, *85*, 52–63. doi:10.1353/hsj.2002.0011.

Scheer, J. R., Harney, P., Esposito, J., & Woulfe, J. M. (2020). Self-reported mental and physical health symptoms and potentially traumatic events among lesbian, gay, bisexual, transgender, and queer individuals: The role of shame. *Psychology of Violence, 10*(2), 131-142. https://doi.org/10.1037/vio0000241

Steele, C.M., Spencer, S., and Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. *Advances in Experimental Social Psychology*, *34*, 379-440. https://doi.org/10.1016/S0065-2601(02)80009-0.

Treadway, L., and Yoakam, J. (1992). Creating a safer school environment for lesbian and gay students. *The Journal of School Health*, *62*(7), 352–357.

Xu, A. J., Zwick, R., & Schwarz, N. (2012). Washing away your (good or bad) luck: Physical cleansing affects risk-taking behavior. *Journal of Experimental Psychology: General, 141*(1), 26–30. https://doi.org/10.1037/a0023997

Appendix A, LGBTQ+ Stereotype Threat Research Materials

Start of Block: Consent Block

Q33 **Informed Consent Form**

Project Title: Examining Social Identities for Quantitative reasoning

Principal Investigator: Chloe Laporte, EMU, Department of Psychology

Faculty Advisor: Rusty McIntyre, Ph.D., EMU, Department of psychology

Invitation to participate in research

You are invited to participate in a research study.

In order to participate, you must be 18 years old and be able to consent to participate on your own. Participation in research is voluntary. Please ask any questions you have about participation in this study by emailing Dr. Rusty McIntyre at rmcinty4@emich.edu.

Important information about this study

Participation in this study involves Completing a brief measure of quantitative reasoning, completing an attitude and behavioral intentions measure, and answering some questions about yourself.

Risks of this study include although no physical or psychological risks are anticipated it is possible as part of the research process that you might feel anxious (e.g., from having your behavior observed). If you feel that the study increases your anxiety you may withdraw from the study without any penalties (doing so, however, forfeits any earned research credits from this study).

The investigator will protect your confidentiality by making sure all your responses remain de-identified (that is no personal information about you such as your name or email address will be connected to your responses). All research and data collected will be stored on a password protect computer or digital drive account. •

Participation in this research is voluntary. You do not have to participate, and if you decide to participate, you can stop at any time.

What is this study about?

This research examines student quantitative reasoning, and their attitudes and behavioral intentions toward a number of products and behaviors typically associated with college-aged individuals. This study is being conducted at Eastern Michigan University.

What will happen if I participate in this study?

Participation in this study involves

Completing a test of quantitative reasoning.

Answering some questions about purchasing intentions.

Answering some questions about typical behaviors that college-aged adults might engage in.

These materials are experimental in nature and some differences in experimental treatments will occur. As you may know, in some research the procedures are straightforward and provide participants with a high degree of face validity. You may also be aware that some research may involve some degree of deception concerning the purposes of the study, the design of the study, and even what the specific instruments measure. As such, this is one of those latter studies. Please realize, however, any use of deception will be fully disclosed upon completion of the experimental session.

The study will last approximately 40 minutes (but not more than 60 minutes), and will require only one session.

What types of data will be collected?

We will collect data about you including your race, gender identification, sexuality.

What are the expected risks for participation?

There are no expected physical or psychological risks to participation.

The primary risk of participation in this study is a potential loss of confidentiality. Your information, as part of this study, will be collected using an online research website (Qualtrics)

and all information within that system is only accessible by the researchers involved in this study.

Are there any benefits to participating?

You will not directly benefit from participating in this research.

Benefits to society include understanding how different groups of people respond to different test information in terms of outcome and attitudes.

How will my information be kept confidential?

We plan to publish the results of this study. We will not publish any information that can identify you. No personal information about you (e.g., name, id, email) will be included in the publication.

We will keep your information confidential by keeping your responses on these materials separated from your last name and email address by using a yoked-survey procedure (after completing the measures, you will activate a link to a second survey that records you last name and email, but there is no way to identify your responses in the first part of the study from the second survey). Your information will be stored in a that only the researchers have access to. That storage will not include your name or email address. Those responses will only be used to award research credits for completion of the study. We will store your information for at least five years after this project ends, but we may store your information indefinitely.

We will make every effort to keep your information confidential, however, we cannot guarantee confidentiality. The principal investigator and the research team will have access to the information you provide for research purposes only. Other groups may have access to your research information for quality control or safety purposes. These groups include the University Human Subjects Review Committee, the Office of Research Development, the sponsor of the research, or federal and state agencies that oversee the review of research, including the Office for Human Research Protections and the Food and Drug Administration. The University Human Subjects Review Committee reviews research for the safety and protection of people who participate in research studies.

Storing study information for future use

We WILL store your information to study in the future. Your information will be labeled with a code and not your name. Your information will be stored in a password-protected or locked file and will be stored indefinitely.

We may share your information with other researchers without asking for your permission, but the shared information will never contain information that could identify you. We will send your de-identified information by email and only upon request.

What are the alternatives to participation?

The alternative is not to participate. You do not have to participate in this research study to earn course credit. If you choose not to participate, your instructor will inform you of alternate ways to obtain course credit.

Are there any costs to participation?

Participation will not cost you anything.

Will I be paid for participation?

You will not be paid to participate in this research study. You will receive 1 hours of course credit if you complete this study. If you do not complete this study, you will not earn that credit.

Study contact information

If you have any questions about the research, you can contact the faculty advisor, Dr. Rusty McIntyre, at rmcinty4@emich.edu or by phone at 734.487.2406 (or by cell 734.536.4105). For questions about your rights as a research subject, contact the Eastern Michigan University Human Subjects Review Committee at human.subjects@emich.edu or by phone at 734-487-3090. For questions about your rights as a research subject, contact the Eastern Michigan University Human Subjects Review Committee at human.subjects@emich.edu or by phone at 734-487-3090.

Voluntary participation

Participation in this research study is your choice. You may refuse to participate at any time, even after signing this form, without repercussion. You may choose to leave the study at any time without repercussion. If you leave the study, the information you provided will be kept confidential. You may request, in writing, that your identifiable information be destroyed. However, we cannot destroy any information that has already been published.

Statement of Consent

I have read this form. I have had an opportunity to ask questions and am satisfied with the answers I received. I give my consent to participate in this research study.

- o ____ I consent, and wish to participate. (1)
- o ____ I do not consent, and wish to stop. (2)

End of Block: Consent Block

Start of Block: Beginning Study Summary

Threat frame: In this research, you will be asked to complete both a test of quantitative reasoning and a brief survey of consumer attitudes of the typical college student. These items might be in different orders.

Prior research has discovered that members of the LGBTQ+ community often demonstrate poorer performance on diagnostic tests of math, science, and data reasoning than do other groups. The nature of this research is to examine the validity of that stereotype here in Michigan.

For each item in the quantitative reasoning portion, the researchers would like you to try your best to answer the questions correctly. Due to constraints of the research, however, please try not to take more than 60 seconds on each quantitative item. If you would like more time for each question, that is okay, as well. We have included a timer for your convenience.

Non diagnostic: In this research, you will be asked to complete both a test of quantitative reasoning and a brief survey of consumer attitudes of the typical college student. These items might be in different orders.

For the quantitative reasoning test, we are attempting to develop baseline norms for how members of the EMU community and here in Michigan typically perform on these types of items. The measure is thus being developed as pilot materials for potential use in other studies.

For each item in the quantitative reasoning portion, the researchers would like you to try your best to answer the questions correctly. Due to constraints of the research, however, please try not to take more than 60 seconds on each quantitative item. If you would like more time for each question, that is okay, as well. We have included a timer for your convenience.

End of Block: Beginning Study Summary

Start of Block: Quant test

Q3 1. A car begins at Point A traveling 30 miles per hour. The car decreases its speed by 5 miles per hour every 10 minutes until the car comes to a complete stop.

Quantity A: The total number of miles traveled between Point A and the final stopping point.

Quantity B: The average speed of the car in miles per hour between Point A and the final stopping point.

- o Quantity A is greater (1)
- o Quantity B is greater (2)
- o The two quantities are equal (3)
- o The relationship cannot be determined from the information given. (4)

Q7 2. At Central Park Zoo, the ratio of sea lions to penguins is 4:11. If there are 84 more penguins than sea lions, how many sea lions are there?

- o 24 (1)
- o 36 (2)
- o 48 (3)
- o 72 (4)
- o 121 (5)

Q14 3. How many odd factors does 768 have?

- o 0 (1)
- o 1 (2)
- o 2 (3)
- o 3 (4)
- o 4 (5)

Q15 4. Before last night's game, a basketball player had scored an average (arithmetic mean) of 20 points per game. She scored 25 points in last night's game, raising her average to 21 points per game.

How many games did she play before last night's game?

- o 3 (1)
- o 4 (2)
- o 5 (3)
- o 6 (4)
- o 7 (5)

Q16 5. What is the probability of rolling a total of 7 with a single roll of two fair six-sided dice, each with the distinct numbers 1-6 on each side?

- o 1/12 (1)
- o 1/6 (2)
- o 2/7 (3)
- o 1/3 (4)
- o 1/2 (5)

Q17 6. What is the average (arithmetic mean) of 2x + 3, 5x – 4, 6x – 6, and 3x – 1?

o 2x + 4 (1)

o 3x - 2 (2)

o 3x + 2 (3)

o 4X - 2 (4)

o 4X + 2 (5)

Q18 7. Indicate <u>all</u> of the possible choices.

There are at least 200 apples in a grocery store. The ratio of the number of oranges to the number of apples is 9 to 10. How many oranges could there be in the store?

□ 171 (1)

□ 180 (2)

□ 216 (3)

□ 252 (4)

□ 315 (5)

Q19 8. A fair, six-sided die is rolled three times. What is the probability that the result of exactly one of the rolls will be an even number?

o 0.167 (1)

o 0.250 (2)

o 0.333 (3)

o 0.375 (4)

o 0.500 (5)

Q20 9.

$7p + 3 = r$

$3p + 7 = s$

Quantity A: r

Quantity B: s

- o Quantity A is greater (1)
- o Quantity B is greater (2)
- o The two quantities are equal (3)
- o The relationship cannot be determined from the information given (4)

Q21 10.

$a < b < c$ $b + c < 0$

Quantity A: ac

Quantity B: 0

- o Quantity A is greater (1)
- o Quantity B is greater (2)
- o The two quantities are equal (3)
- o The relationship cannot be determined from the information given (4)

Q22 11. The cost, in cents, of manufacturing x crayons is 570 + 0.5x. The crayons sell for 10 cents each. What is the minimum number of crayons that need to be sold so that the revenue received recoups the manufacturing costs?

- o 50 (1)
- o 57 (2)
- o 60 (3)
- o 61 (4)
- o 95 (5)

Q23 12. Set T consists of five integers: the first five odd prime number when counting upward from zero. This gives set T a standard deviation of approximately 3.71. Which of the following values, if added to the set of T, would increase the standard deviation of set T?

- o 11 (1)
- o 9 (2)
- o 7.8 (3)
- o 4.15 (4)
- o 3.7 (5)

Q24 13. Quantity A: The number of distinct positive integer factors of 96.

Quantity B: The number of distinct positive integer factors of 72.

- o Quantity A is greater (1)
- o Quantity B is greater (2)
- o The two quantities are equal (3)
- o The relationship cannot be determined from the information given (4)

Q25 14. Quantity A: The number of seconds in 7 hours

Quantity B: The number of hours in 52 weeks

- o Quantity A is greater (1)
- o Quantity B is greater (2)
- o The two quantities are equal (3)
- o The relationship cannot be determined from the information given (4)

Q26 15. If the average test score of four students is 85, which of the following scores could a fifth student receive such that the average of all five scores is greater than 84 and less than 86? Indicate all such scores.

- ▢ 88 (1)
- ▢ 86 (2)
- ▢ 85 (3)
- ▢ 83 (4)
- ▢ 80 (5)

Q27 16. A customer service center had z inbound calls on hold. During the next minute, one-third of those calls were answered but 15 new calls were places on hold so that 35 callers were then holding.

Quantity A: z

Quantity B: 33

- o Quantity A is greater (73)
- o Quantity B is greater (74)
- o The two quantities are equal (75)
- o The relationship cannot be determined from the information given (76)

End of Block: Quant test

Start of Block: Consumer atts

Q29 In this section of the study, we are going to ask you questions about your behavior and attitudes toward products, people, and actions. Please answer these questions to the best of your knowledge.

Q5 Please indicate which of the following products you might be likely to buy the next time you are out shopping using the scale provided.

	0 Not at all (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 Extremely Likely (6)
Surface disinfectant (e.g., Lysol) (1)	o	o	o	o	o	o
Protein bars (2)	o	o	o	o	o	o
Shirts/Tops (3)	o	o	o	o	o	o
Hand sanitizer (4)	o	o	o	o	o	o
Juice (5)	o	o	o	o	o	o
Towels (6)	o	o	o	o	o	o
Cups/glasses (7)	o	o	o	o	o	o
Soaps/bodywash (8)	o	o	o	o	o	o

Linens/bedding (9)	o	o	o	o	o	o
Shorts/pants (10)	o	o	o	o	o	o
Pop/Cola (11)	o	o	o	o	o	o
Bleach (12)	o	o	o	o	o	o
Plates/bowls (13)	o	o	o	o	o	o

Q6 Please indicate which of the following activities you may be likely to do within the next few days using the scale provided.

	0 Not at all (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 Extremely Likely (6)
Go for a run/walk (1)	o	o	o	o	o	o
Go on a hike (2)	o	o	o	o	o	o
Practice yoga (3)	o	o	o	o	o	o
Play Sports (4)	o	o	o	o	o	o
Practice meditation/mindfulness (5)	o	o	o	o	o	o
Complete core exercises (sit-ups, push-ups, etc.) (6)	o	o	o	o	o	o
Go to the gym (7)	o	o	o	o	o	o

Q8 Please indicate which of the following social activities you may be likely to do within the next few days using the scale provided.

	0 Not at all (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 Extremely Likely (6)
Hang out with friends (1)	o	o	o	o	o	o
Go to a social event (2)	o	o	o	o	o	o
Attend a date with a love interest (3)	o	o	o	o	o	o
Engage in protected sex (4)	o	o	o	o	o	o
Go to a bar/pub (5)	o	o	o	o	o	o

Hookup with someone on the first night (6)	o	o	o	o	o	o
Attend a concert (7)	o	o	o	o	o	o
Watch a movie in theatre (8)	o	o	o	o	o	o
Go on a blind date (9)	o	o	o	o	o	o
Engage in unprotected sex (10)	o	o	o	o	o	o
Have risky sex (in public, with strangers, violent, etc.) (11)	o	o	o	o	o	o

Q32 During this part of the study, we are going to ask you questions regarding your personal feelings and thoughts. Please answer these questions to the best of your knowledge.

Q9 Did anything stand out to you during the study?

_____

Q10 What was the study about?

_____

Q11 Are you aware that members of the LGBTQ+ community can be stigmatized on certain tasks compared to cisgender/heterosexual individuals?

_____

End of Block: Consumer atts

Start of Block: Block 3

Q12 After the description of the research, please indicate how aware you were of the following statements using the scale provided.

	0 Not at all (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 Extremely Likely (6)
I feel strongly about my identity (1)	o	o	o	o	o	o
I take pride in my identity (2)	o	o	o	o	o	o
I feel connected to people with similar identities (3)	o	o	o	o	o	o
I feel frustrated because of my identity (4)	o	o	o	o	o	o

My identity is important to me (5)	o	o	o	o	o	o
I feel connected to a larger group (6)	o	o	o	o	o	o
I believe my identity is good (7)	o	o	o	o	o	o
I get a sense of belongingness from my identity (8)	o	o	o	o	o	o
I am in control of my identity and how I express it (9)	o	o	o	o	o	o
I feel positively about myself overall (10)	o	o	o	o	o	o

Q13 Please indicate how strongly you feel in response to each of the items below using the scale provided.

	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
Interested (1)	o	o	o	o	o
Stressed (2)	o	o	o	o	o
Excited (3)	o	o	o	o	o
Sad (4)	o	o	o	o	o
Strong (5)	o	o	o	o	o
Angry (6)	o	o	o	o	o
Enthusiastic (7)	o	o	o	o	o
Scared (8)	o	o	o	o	o

Proud (9)	o	o	o	o	o
Hostile (10)	o	o	o	o	o
Alert (11)	o	o	o	o	o
Irritable (12)	o	o	o	o	o
Belongingness (13)	o	o	o	o	o
Nervous (14)	o	o	o	o	o
Determined (15)	o	o	o	o	o
Ashamed (16)	o	o	o	o	o
Control (17)	o	o	o	o	o
Jittery (18)	o	o	o	o	o
Active (19)	o	o	o	o	o
Afraid (20)	o	o	o	o	o

End of Block: Block 3

Start of Block: Demographics

Q35 Please specify your ethnicity.

- o African-American (1)
- o Hispanic or Latino (2)
- o Asian (3)
- o Native American (4)
- o Caucasian or White (5)
- o Other (6)
- o Prefer not to answer (7)

Q36 Please specify your age.

- o 18-25 (1)
- o 26-34 (2)
- o 35-43 (3)
- o 44 or older (4)
- o Prefer not to answer (5)

Q37 What gender do you identify with?

- o Male (1)
- o Female (2)
- o Non-binary / third gender (3)
- o Prefer not to answer (4)

Q38 If you wish to disclose, do you consider yourself to be part of the LGBTQ+ community?

o Yes (1)

o No (2)

o Prefer not to disclose (3)

Q51 At the start of this study, the directions explained that the research was using a measure of quantitative reasoning. Please select below what type of measure it was?

o Diagnostic Test (1)

o Comparing Norms of Response (2)

Q52 Additionally, the directions explained that the research was focused on which of the groups below

o Members of the LGBTQ+ community (1)

o African-American Students (2)

o White Students (3)

o Commuter Students (4)

End of Block: Demographics

Start of Block: Block 5

Q34 Debriefing Statement (Please read).

Thank you for participating in this study! We hope you enjoyed the experience. This form provides background about our research to help you learn more about why we are doing this study. Please feel free to ask any questions or to comment on any aspect of the study by emailing the faculty advisor for this project, Dr. Rusty McIntyre, at rmcinty4@emich.edu.

At the beginning of this study, you were told that the purpose was to gain a better understanding of a measure of quantitative reasoning and to assess student attitudes toward consumer products and behaviors. As you may know, some studies use deception in situations where there is no other way to conduct the experiment without a level of bias. We are very sorry to say that the current study did involve deception. It was necessary to use deception because, had participants

known the true nature of the study, responses would have been likely to change. Specifically, we had used random assignment to what type of quantitative test participants were asked to perform, either a test that would indicate if one group (e.g., LGBTQ+) would underperform compared to others, or a test that was merely a lab task.

Additionally, you were asked to evaluate your likeliness of engaging in certain behaviors or purchase certain products. In reality, the test frame as being diagnostic was expected to impact those choices (causing them to become more careful or riskier). In reality, the purpose of this study is to investigate if test frames that suggest performance could perpetuate a group stereotype can impact not only performance, but also subsequent behaviors for members of the LGBTQ+ community. Admittedly, if there had been a different way to study these processes we would have engaged in those processes. In order to better understand this process, and to devise interventions to counter said stereotypes it is needed that other participants are unaware of the procedures used in this study. As such, we hope that you will keep the details of this study confidential if any friends or classmates may inquire about it. It is important to note that sometimes people can feel a bit upset, anxious, or even distressed when completing research of this nature. If you feel that you are upset, or would feel better speaking to someone please consider contacting either the Primary Investigator (Rusty McIntyre, at 734 536-4105; rmcinty4@emich.edu) or contacting the professionals at the Counseling and Psychological Services Center (CAPS) at 734 487-1118; counseling.services@emich.edu; or going there directly at 1075 N. Huron River Drive (CAPs is in the new buildings at the North end of EMU's main campus).

The data from this study will be presented in groups in research journals, however we want to assure you that no identifying information will be used. All data will be kept secure, only to be analyzed by trained researchers. Nonetheless, if you feel uncomfortable with this study, your participation in this is still voluntary. If you wish, you may withdraw after reading this debriefing form, at which point all records of your participation will be destroyed. You will not be penalized if you withdraw. You can also feel free to contact the investigator with any further questions. Investigator Contact Number/Email: Rusty McIntyre (734)536-4105 rmcinty4@emich.edu. If you want more information about your rights as a participant or want to report a research-related harm, you may contact the Institutional Review Board at (734) 487-3090.

End of Block: Block 5