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Social Psychology

The Association Between Prejudice Toward and Essentialist Beliefs About Transgender People

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Previous research often suggests that people who endorse more essentialist beliefs about social groups are also likely to show increased prejudice towards members of these social groups, and there is even some evidence to suggest that essentialism may lead to prejudice and stereotyping. However, there are several notable exceptions to this pattern in that, for certain social groups (e.g., gay men and lesbians), higher essentialism is actually related to lower prejudice. The current studies further explored the relationship between essentialism and prejudice by examining a novel type of essentialism—transgender essentialism (i.e., essentializing transgender identity), and its relationship to prejudice towards transgender people. Study 1 (N = 248) tested the viability of transgender essentialism as a construct and examined the association between transgender essentialism and transprejudice, while Studies 2a (N = 315), 2b (N = 343), 3a (N = 310), and 3b (N = 204) tested two casual pathways to explain this relationship. The results consistently showed that the more that people endorse transgender essentialist beliefs, the warmer their feelings towards trans people (relative to cis people) were, echoing past research showing a similar relationship between essentialism and prejudice towards sexual minorities. However, the manipulations of both essentialism (Studies 2a and 2b) and prejudice (Studies 3a and 3b) were largely unsuccessful at changing the desired construct, meaning we were unable to provide direct causal tests. The one exception was a successful manipulation of the universality of trans experiences, but even here this resulted in no change in prejudice. The primary contribution of this work is in robustly demonstrating that greater transgender essentialism is associated with transprejudice.

Psychological essentialism is a belief that members of categories or groups have an underlying "essence" that makes them distinct from members of other groups and affords similarities or shared properties between group members (Gelman, 2004). These "essential" qualities of group members, as well as the differences between groups, are often thought to be biologically based and universal, as demonstrated in the (in)famous book title, *Men are from Mars, Women are from Venus*.

For decades researchers have been studying the relationship between essentialism and negative outcomes, like prejudice and stereotyping, for a range of social groups. These studies have often reported that the more people endorse essentialist beliefs the more likely they are to hold prejudice towards people in those groups (e.g., Jayaratne et al., 2006; Keller, 2005). Some have even argued that essentialism may cause prejudice and stereotyping (e.g., Mandalaywala et al., 2018; Williams & Eberhardt, 2008). However, the relationship between essentialism and prejudice is not always quite so straightforward and consistent. For example, for some social groups higher essentialism is actually associated with lower prejudice (e.g., Haider-Markel & Joslyn, 2008; Jayaratne et al., 2006; Rüsch et al., 2010). In the current work we sought to add to existing knowledge about the relationship between essentialism and prejudice by exploring a novel type of essentialism, transgender essentialism (i.e., essentializing transgender identity), and its relationship towards transprejudice.

Association between Essentialism and Prejudice

Social psychological research has historically documented that greater essentializing of stigmatized groups is associated with more stereotyping, prejudice, and discrimination toward those groups. This relationship has been shown in a range of social groups, such as those based on

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gender (Keller, 2005; Martin & Parker, 1995; Wilton et al., 2019), race (Jayaratne et al., 2006; Williams & Eberhardt, 2008), and ethnicity (Keller, 2005). For example, White people who believe that race is biologically based are more likely to show racial prejudice towards Black people (Jayaratne et al., 2006) and are more likely to accept racial disparities more broadly (Williams & Eberhardt, 2008). Similarly, the more people endorse a biological understanding of gender, the more they express sexist attitudes (Keller, 2005) and the less likely they are to support women's rights (Wilton et al., 2019).

On the other hand, the literature is also full of examples in which a correlation is observed between essentialism and prejudice, but the exact relation is reversed. In these cases, more essentialism is associated with lower prejudice or greater tolerance and understanding. For example, Rüsch and colleagues (2010) showed that greater endorsement of biogenetic causes of mental illness was related to less perceived responsibility of people with mental illness for their illness (though also related to greater desire for social distance from people with mental illness). A relatively large number of studies have shown a similar pattern with regard to sexual minorities. The more that people hold biologically essentialist beliefs about homosexuality (e.g., believing that homosexuality is biologically based), the more accepting they are of and less prejudiced they are towards sexual minorities (Haider-Markel & Joslyn, 2008; Jayaratne et al., 2006). Interestingly, Haslam and Levy (2006) found that some aspects of essentialist beliefs about homosexuality (i.e., greater immutability and universality) were associated with positive attitudes towards lesbians and gay men, but another aspect of essentialism—discreteness—was associated with negative attitudes toward these groups. Nonetheless, the overwhelming bulk of research in the domain of sexual orientation suggests that greater endorsement of essentialist beliefs about homosexuality is associated with *less* prejudice towards sexual minorities (Haslam et al., 2002; Hegarty, 2002; Hegarty & Pratto, 2001; Herek & Capitanio, 1995; Whitley, 1990).

Does Essentialism Lead to Prejudice?

While it is clear that across domains, essentialism and prejudice are often associated, even if the exact direction shifts by domain, whether there is a *causal* relationship between the two variables is not certain. The most studied direction of causality is from essentialism to prejudice. Some researchers have argued that the well-documented relation between support for biologically essentialist views of homosexuality and more positive attitudes towards sexual minorities is evidence for attribution theory (e.g., Armesto & Weisman, 2001), which posits that causal attributions for stigmas (i.e., attributing a stigma to a cause that the stigmatized person can control) lead to prejudice (Weiner et al., 1988). With regard to sexual minorities, under attribution theory biologically essentialist beliefs remove blame for stigma from the individual and instead place it on uncontrollable causes (e.g., genetics, hormones, etc...), leading to more positive attitudes towards sexual minorities. However, direct causal evidence for this link is relatively sparse (e.g., Hegarty, 2018, 2020; Hegarty & Golden, 2008). More concrete evidence for a causal relationship between essentialism and prejudice comes from the domains of race, ethnicity, and gender. For example, researchers have shown that when participants are led to believe that race is biologically determined as opposed to socially constructed through the use of fictional science news articles, they are more accepting of racial inequities, less interested in interacting with racial outgroups (Williams & Eberhardt, 2008), and report greater explicit prejudice (Mandalaywala et al., 2018). Additionally, Keller (2005) showed that Eastern- and Western-European participants who were primed to think about essentialism showed more prejudice toward Eastern-Europeans than those who were not primed, though this effect only emerged in participants who already held biologically essentialist beliefs at the outset. Studies have also shown that this apparent casual path from essentialism to prejudice holds when essentialism is experimentally *decreased*. Wilton and colleagues (2019) found that participants showed greater support for women's rights after being exposed to anti-gender essentialist evidence. Altogether, this work suggests that, at least sometimes, essentialism leads to prejudice.

Essentialism and Prejudice towards Transgender People

In the present work, we aimed to investigate the relation between essentialism and prejudice in a domain that is relatively new both in the study of essentialism and in the study of prejudice, yet is increasingly at the forefront of popular discourse. Transgender people are receiving increasing attention, and in many Western cultures, increasing civil rights, but also face a great deal of prejudice (Bockting et al., 2016; Miller & Grollman, 2015; Norton & Herek, 2013; Stroumsa, 2014). Only a relatively limited number of studies have investigated the link between prejudice and essentialism in this domain. For example, Callahan and Zukowski (2019) found that more essentialist attitudes towards a range of social groups were associated with negative reactions towards sharing a restroom with a transgender person, while Roberts, Ho, Rhodes, and Gelman (2017) showed that general psychological essentialism was predictive of support for boundary-enhancing anti-trans legislation (e.g., requiring trans people to use the bathroom corresponding with their sex assigned at birth). Researchers have also investigated the link between *gender* essentialism (e.g., how much people believe men and women are different) and transprejudice, finding that greater endorsement of essentialism is associated with greater transprejudice, similar to the associations observed in the domains of gender and race. For example, Prusaczyk and Hodson (2019) found that conservative participants were more likely to hold binary beliefs about gender, which in turn was predictive of greater prejudice towards transgender people. Relatedly, in a study of 5- to 10-year-old children, those who tended to categorize transgender peers on the basis of sex as opposed to gender (perhaps a form of biological essentialism) expressed significantly more transprejudice (Gülgöz et al., 2018). Broadly, these studies suggest that greater essentialism is associated with higher rates of transprejudice.

There is fairly limited data on causality of the essential-

ism/prejudice relation in the domain of transgender attitudes, and when this topic has been explored, it too has focused on the degree to which people endorse *gender* essentialism. In one of the few studies on the topic, participants who were exposed to anti-essentialist evidence for gender differences between men and women (i.e., gender essentialism) reported higher support for transgender rights compared to a control condition (Wilton et al., 2019). In a different study, adults who were exposed to an article that explained sex differences based on biological essentialism expressed more transprejudice compared to participants in a control condition, though interestingly participants who read an article that questioned this same biological deterministic view of sex differences by focusing on an interactionist perspective of sex differences did not show less transprejudice compared to participants in the control condition (Ching & Xu, 2018). Generally, these studies provide evidence that gender essentialist beliefs may be causally related to transprejudice.

Present Studies

We know of no work that has specifically examined the relationship between transprejudice and *transgender* essentialism—the belief that being transgender is essential. Past studies investigated the degree to which participants essentialized gender (i.e., differences between men and women) or essentialism of social categories in general and examined the link to trans prejudice. In the current studies, we focused on two aspects of transgender essentialism—biological beliefs (e.g., believing that being transgender is biologically based) and universality (e.g., believing that transgender people exist in many different cultures and across time). We chose to focus on these two tenets of essentialism specifically because we perceived them to be the most potentially influential parts of the national conversation surrounding transgender identity at the time the studies were conducted, while other aspects of essentialism (e.g., discreteness) felt relatively esoteric in comparison. Additionally, we chose to focus specifically on prejudice towards and essentialist beliefs about binary-identifying transgender people (i.e., transgender people who identify as either men or women), as at the time these studies were conducted, most of the public discussion of trans people focused on binary trans people.

Though past research examining the relation between essentialism and transprejudice shows that higher levels of essentialism are predictive of greater transprejudice, attribution theory would argue that the more control that transgender people are perceived to have for their stigmatized identity (i.e., having a gender identity that does not align with one's assigned sex), the less positive people's feelings will be towards transgender people. Thus, similar to sexual minorities, one might predict that *greater* transgender essentialism will be associated with *lower* prejudice towards transgender people.

In the current work we specifically examined the relation between transgender essentialism and prejudice towards transgender people in five studies. First, in Study 1, we conducted a correlational and descriptive study to investigate the extent to which people spontaneously essentialize transgender people, the extent of transprejudice, and whether essentialism predicts transprejudice. Next, in Studies 2a and 2b, we conducted two nearly identical studies to test whether manipulating essentialism impacts trans prejudice. Finally, due to mixed findings in the previous studies, Studies 3a and 3b tested whether manipulations of prejudice lead to changes in essentialism.

Study 1

Study 1 was a large, online exploratory survey of attitudes toward and beliefs about transgender people with a series of open-ended and Likert-style questions meant to provide preliminary data for several future studies in the lab. Our first goal for the present paper was to assess whether people spontaneously essentialize transgender identities. We then asked whether transgender essentialism was related to prejudice against transgender people. Other measures were included in this study but are not related to the remainder of the paper. They are listed in S1 of the Supplemental Materials.

Methods

Participants. Data was collected from 250 U.S. adults recruited through Mechanical Turk on 5/19/2016. We aimed for a sample of 250 participants, as correlation estimates generally stabilize as *n* approaches 250 (Schönbrodt & Perugini, 2013). However, we excluded two participants as they did not identify as cisgender, resulting in a final sample of 248 cisgender adults (125 women, 123 men; *M age* = 37.32, *SD age* = 12.47; see Table 1 for demographic information by study).[1]

Measures

Lay conceptions of transgender etiology. To assess whether people spontaneously use essentialism as an explanation for how transgender identities form, participants answered a free-response question, "What do you think causes someone to be transgender?" This question was asked first so that other essentialism measures would not influence responses to this item. In a first step, one of the lead authors reviewed the responses and then developed a preliminary coding scheme based on categorical codes (e.g., did the participant mention that being transgender is innate? 1 if yes, 0 if no). Four common explanations were ultimately iden-

1 Though it is often the practice in the field to exclude LGB participants when examining attitudes towards these groups, due to a helpful comment from a reviewer we chose to include LGB participants in our samples throughout this paper. The statistical significance of the results remain the same when LGB participants are excluded, aside from a statistically significant correlation between biological essentialism and transprejudice in Study 3b becoming nonsignificant when LGB participants are excluded.

Table 1. Participant demographics for each sample

		Study 1	Study 2a	Study 2b	Study 3a	Study 3b
Race[1]	White	81.45%	40.32%	42.27%	79.03%	13.24%
	Black	6.85%	4.44%	5.54%	9.03%	1.47%
	Latino/Hispanic	8.47%	5.40%	8.45%	4.84%	1.96%
	Asian American	5.65%	45.71%	41.11%	8.39%	61.27%
	Asian	0.00%	7.94%	6.12%	0.32%	21.57%
	Native American	2.42%	0.32%	2.33%	1.61%	0.49%
	Other	1.21%	5.08%	7.58%	1.29%	7.84%
Geographic Location[2,3]	New England	6.05%	-	-	4.19%	-
	Middle Atlantic	10.48%	-	-	12.90%	-
	East North Central	14.92%	-	-	14.84%	-
	West North Central	2.82%	-	-	7.42%	-
	South Atlantic	21.37%	-	-	24.52%	-
	East South Central	4.84%	-	-	6.45%	-
	West South Central	9.68%	-	-	9.03%	-
	Mountain	10.48%	-	-	4.84%	-
	Pacific	19.35%	100.00%	100.00%	14.84%	100.00%
	Missing	0.00%	0.00%	0.00%	0.97%	0.00%
Political Orientation	Very Conservative	5.65%	1.27%	1.17%	6.13%	0.49%
	Conservative	18.55%	8.57%	11.37%	17.10%	2.94%
	Moderate	27.42%	34.29%	33.82%	29.35%	54.41%
	Liberal	27.82%	45.40%	41.69%	30.97%	35.78%
	Very Liberal	20.56%	10.48%	11.95%	16.45%	6.37%
Know trans person	Yes	25.40%	42.86%	42.86%	36.13%	29.90%
	No	74.60%	57.14%	57.14%	63.87%	70.10%
Closeness to trans person known best[4,5]	Mean	3.79	3.13	3.20	3.92	3.41
	SD	1.71	1.69	1.74	1.77	1.39

[1]Percentages sum to more than 100% because participants could identify themselves as more than one race
[2]Participants in Study 2a, Study 2b, and Study 3b were all students at a large research university in the Pacific Northwest of the United States
[3]Regions for geographic location were taken from the U.S. Census Bureau Regions and Divisions
[4]Means and standard deviations for closeness to the trans person a participant knows best were only calculated for participants who indicated that they know a transgender person
[5]Closeness to the trans person a participant knows best was measured on a scale from 1 (Not at all close) to 7 (Very close)

tified: biological, mental illness, abuse/trauma, and environmental reasons. Biological explanations included statements about hormones, genetics, that being transgender is innate, that transgender people are born that way, and that "it's just who they are." Mental illness explanations included statements that transgender people need help, that they are sick, or that they have something wrong with them. Explanations concerning abuse/trauma were characterized by statements that transgender people have been abused, harassed, or bullied, that they have been sexually abused, or that they have experienced trauma such as being in foster care or losing a parent, etc.... Lastly, environmental reasons included any external influence that is not already included in one of the previous categories (e.g., abuse/trauma), such as parental influence (e.g., parents are liberal), influence from siblings (e.g., an assigned male that only has sisters), exposure to media/culture, or exposure to toys/clothing. Next, two research assistants coded responses for the presence of each explanation. Each participant's responses could be coded as more than one type of explanation. Using the guidelines suggested by McHugh (2012), there was moderate agreement across coders (all K's > .59: Biological, K = .84; Mental illness, K = .68, Abuse/trauma, K = .60; and Environmental, K = .82). Discrepancies were resolved by one of the lead authors, who was not one of the original coders.

Transgender Essentialist Beliefs Scale. Next, participants

Table 2. Example lay conceptions of transgender etiology from participants

Biological essentialism	Mental illness	Environmental reasons	Abuse/trauma
Some people are born that way and it is a natural part of being human.	*Dysphoria. They have head problems but instead of being treated for it they are given special treatment.*	*…The social reason can be any combination of things. The environment, the status quo, the prevailing classes can all have some kind of influence.*	*Traumatic childhood experiences, abuse, bullying…can cause someone to become transgender.*
I believe it is genetic and they are born that way.	*I believe it is a psychological disorder.*	*A lack of a proper upbringing.*	*A long-term mental injury resulting from sexual trauma that was experienced during childhood or adolescence.*
I think people are born transgender. It could be inherited or it may caused to influences that occurred while they were still in the womb.	*I believe transgender identity is a kind of sexual confusion. It is a disorder that is caused by mental illness.*	*I think a person's life experiences causes them to be transgender. People experiment and do different things*	*Possibly sexual abuse as a child.*

completed a scale adapted from Haslam and Levy (2006) to measure two dimensions of essentialism about transgender identities: biological essentialism and universality. Biological essentialism was measured by two items which were averaged to form a composite (r = .68, p < .001): "Being transgender is caused by biological factors" and "Being transgender is an innate, genetically-based quality" (1—Strongly disagree, 7 — Strongly agree). Similarly, universality was measured by five items averaged to form a composite (Cronbach's α = .85, all item total correlations greater than .54, indicating good internal consistency). For example, "Transgender people have probably existed through human history" (1—Strongly disagree, 7—Strongly agree). See S2 of the Supplemental Materials for a full list of items.

Feelings Towards Transgender (Relative to Cisgender) People. Participants completed feeling thermometer items about transgender men, transgender women, cisgender men, and cisgender women (i.e., "Imagine that your feelings about different groups could be measured on a thermometer, like the one below, ranging from 0 to 100 degrees;" See S3 of the Supplemental Materials for complete language and graphics used). To assess transprejudice, we calculated a score measuring feelings towards transgender people relative to cisgender people by subtracting the average score for transgender men and women from the average score for cisgender men and women such that higher numbers indicated more positive feelings towards cisgender people relative to transgender people. We chose to use a relative score as feeling thermometers are particularly susceptible to individual differences such as positivity bias, and relative measures help to control for these differences (e.g., see Wilcox et al., 1989).[2]

Demographics. Finally, participants reported additional information such as their gender, age, and sexual orientation (See S1 of the Supplemental Materials for full list of items).

Results

Lay conceptions of transgender etiology. Participants most commonly used four explanations in their free responses as for what they believe "causes" someone to be transgender: biological essentialism (61%), mental illness (17%), environmental reasons (14%), and abuse/trauma (6%) (these sum to more than 100% because responses could be coded as more than one type of explanation; see Table 2 for example responses). Thus, a majority of participants (61%) spontaneously used biological essentialism to describe transgender identities, suggesting essentialism is an ecologically valid psychological variable as applied to the study of perceptions of trans people.

Feelings towards transgender (relative to cisgender) people. Participants on average demonstrated prejudice towards transgender people as they felt significantly more warmth toward cisgender people than transgender people, as indicated by a one sample t-test comparing participants' feelings towards transgender people relative to cisgender people (M = 16.99, SD = 27.40) to zero (i.e., feeling no different towards cisgender and transgender people), $t(247)$ = 9.76, p < .001.

Essentialism and feelings towards transgender (relative to cisgender) people. Biological essentialism and universality were both significantly associated with feelings towards transgender people relative to cisgender people,

2 We also calculated an absolute score for each study by averaging the score for transgender men and women such that higher numbers indicated more positive feelings towards transgender people (aside from Studies 3a and 3b, for which the absolute score was only feelings towards transgender women). The statistical significance of the results and the conclusions drawn from the results were no different for any of the studies when this absolute score was used in place of the relative score. An analysis script using this absolute score can be found on this paper's project page on the Open Science Framework (https://osf.io/xfr9w/?view_only=87e370ef9f6b4b1ea04e1c2bc37c7023).

Table 3. Linear regression results for transprejudice regressed on biological essentialism and universality

	b	*SE*	*B*	*t*	*p*	Fit
Intercept	70.19	5.61		12.52	< .001	
Biological essentialism	-3.62	1.09	-.23	-3.33	.001	
Universality	-6.95	1.37	-.36	-5.09	< .001	
						R^2 = .29
						F(2, 245) = 50.76

Table 4. Zero-order correlations and linear regression results for transprejudice regressed on biological essentialism, universality, and each of the free response explanation categories

	Regression Analysis					
	b	*SE*	*B*	*t*	*p*	Fit
Intercept	61.48	6.82		9.01	< .001	
Biological essentialism	-5.42	1.39	-.35	-3.89	< .001	
Universality	-5.09	1.52	-.26	-3.35	< .001	
Biological explanations	7.64	4.30	.13	1.77	.077	
Mental illness explanations	13.04	4.46	.18	2.92	.004	
Environmental explanations	6.32	4.87	.08	1.30	.196	
Abuse/trauma explanations	3.30	6.64	.03	0.50	.620	
						R^2 = .31
						F(6, 215) = 17.31

	Correlation Analysis					
	1	2	3	4	5	6
Relative Feelings	-					
Biological essentialism	-0.47***	-				
Universality	-0.51***	0.65***	-			
Biological explanations	-0.26***	0.65***	0.47***	-		
Mental illness explanations	0.29***	-0.22***	-0.29***	-0.25***	-	
Environmental explanations	0.19**	-0.24***	-0.18**	-0.06	-0.07	-
Abuse/trauma explanations	0.11	-0.13	-0.07	-0.10	0.13	0.17*

such that the more essentialist a participant was, the less transprejudice they reported, as shown through linear regression (see Table 3 for regression results; see Table 5 for descriptive statistics).

We also wanted to examine the relationship between transprejudice and what participants believe "causes" someone to be transgender. Thus, we conducted an additional linear regression model in which we added each of the most commonly used explanations for what participants believed "causes" someone to be transgender in addition to biological essentialism and universality, all predicting transprejudice. Biological essentialism and universality were again both significantly associated with feelings towards transgender people relative to cisgender people. Additionally, participants' use of mental illness as an explanation for what causes someone to be transgender was a significant predictor of feelings towards transgender people relative to cisgender people, though the use of biological, environmental, and abuse/trauma explanations were not predictors of feelings towards transgender people relative to cisgender people (see Table 4 for regression results and zero-order correlations).

Discussion

Study 1 showed that people spontaneously think about the etiology of transgender identities in biologically essentialist ways, consistent with past work showing that people attribute biological factors as causing transgender identities (e.g., Elischberger et al., 2016, 2018). This demonstrates that transgender essentialism is an externally valid construct. Additionally, Study 1 established that essentialism of transgender identities is inversely related to prejudice toward transgender people. We found that both greater biological essentialism and universality were linked with less prejudice towards transgender people (i.e., warmer feelings towards transgender people relative to cisgender people), echoing research showing similar associations in

Table 5. Descriptive statistics and inter-item correlations for main variables by study

Study	Variable	Mean	SD	1	2
Study 1					
	Bio Essentialism	4.77	1.77	-	
	Universality	5.17	1.42	0.65***	-
	Relative feelings	16.99	27.40	-0.47***	-0.51***
Study 2a					
	Bio Essentialism	4.32	1.18	-	
	Universality	4.90	1.02	0.39***	-
	Relative feelings	20.06	25.71	-0.27***	-0.38***
Study 2b					
	Bio Essentialism	4.36	1.23	-	
	Universality	4.88	1.02	0.41***	-
	Relative feelings	16.00	24.52	-0.37***	-0.38***
Study 3a					
	Bio Essentialism	4.46	1.70	-	
	Universality	4.99	1.37	0.67***	-
	Relative feelings	18.94	30.80	-0.60***	-0.51***
Study 3b					
	Bio Essentialism	4.13	1.15	-	
	Universality	4.82	0.99	0.28***	-
	Relative feelings	14.46	22.64	-0.15*	-0.17*

research on sexual minorities (e.g., Haider-Markel & Joslyn, 2008; Jayaratne et al., 2006). Interestingly, these findings suggest divergence from the small body of work that has examined the relationship between general/gender essentialism and transprejudice, which has generally found that greater gender essentialism (i.e., focusing on differences between men and women) and general essentialism is predictive of more transprejudice (Callahan & Zukowski, 2019; Gülgöz et al., 2018; Prusaczyk & Hodson, 2019; Roberts et al., 2017). Additionally, we found that the use of mental illness as an explanation for what causes someone to be transgender was related to feelings towards transgender people relative to cisgender people, suggesting that pathologizing transgender identities may be closely related to transprejudice. Overall, these data are correlational and do not speak to a causal pathway from essentialism to prejudice, thus we continued by experimentally investigating a potential causal association in the following studies.

Studies 2a and 2b: Investigating a Causal Pathway for Essentialism → Prejudice

Studies examining the impact of *gender* essentialism on transprejudice as well as studies of other social categories have suggested that changes in essentialism can sometimes lead to changes in prejudice (Ching & Xu, 2018; Keller, 2005; Mandalaywala et al., 2018; Williams & Eberhardt, 2008; Wilton et al., 2019). Further, attribution theory suggests that causal attributions for transgender identity should lead to prejudice towards transgender people (Weiner et al., 1988). Therefore, in Studies 2a and 2b (presented together because they are nearly identical), we tested whether experimentally manipulating transgender essentialism would impact prejudice toward trans people. In addition to assessing the impact of essentialism on prejudice through feelings towards transgender people relative to cisgender people, we also sought to examine the impact of essentialism on the extent to which people pathologize transgender identity and the degree of social distance they want to maintain from transgender people. We used the same technique for manipulating essentialism as was first used by Williams and Eberhardt (2008) (i.e., presenting participants with faux scientific news articles) adapted to target two types of essentialism—biological and universality—as these were the two types of essentialism shown to be related to transprejudice in Study 1.

Methods

Studies 2a and 2b utilized a between-subjects design in which participants were assigned to one of three conditions—control, biological essentialism, and universality essentialism—presented in an online survey format. In each condition, participants were asked to read an article describing scientific evidence in support of the respective type of essentialism (excluding the control condition in which no article was presented). Next, participants completed a variety of measures that were identical across conditions.

Participants. In both Studies 2a and Study 2b, we aimed for a final sample of 300 participants. In order to account for exclusions, we collected data from slightly over 300 participants in both studies. In Study 2a, 320 undergraduate students at a large research university in the Pacific Northwest of the United States participated in exchange for extra

course credit between 11/15/2016 and 12/6/2016. Five participants were excluded as they did not identify as cisgender, leaving a final sample of N = 315 (209 women, 106 men; *M age* = 18.95, *SD age* = 1.41). In Study 2b, 346 undergraduates from the same subject pool initially participated between 3/6/2017 and 3/10/2017, though three participants were excluded for not identifying as cisgender, leaving a final sample of N = 343 (231 women, 112 men; *M age* = 19.08, *SD age* = 1.36; see Table 1 for demographic information by study).

Materials. In all conditions, participants were first given a basic definition of the word *transgender* (i.e., "A person who identifies with or expresses a gender identity that differs from the one which corresponds to the person's sex at birth") and a clarification of the difference between trans women and men because people are sometimes confused about these terms (e.g., "Transgender women were born males but deeply identify as women"). Then, participants were randomly assigned to one of the following conditions:

Control. Participants read only the definitions before answering the dependent measures.

Biological essentialism. Participants read an excerpt of a fake article based on real findings in the scientific literature that could be seen as evidence for a biological influence on gender identity (a twin study). For example, participants read "Research with twins has suggested a biological basis for being transgender. Dr. Diamond found that identical twins were 9 times more likely than fraternal twins to be transgender if their twin was also transgender," (See S4 of the Supplemental Materials for full article). For participants in Study 2b, in order to potentially make the intervention stronger and the article to look more like it came from a scientific news story, the article was paired with a picture of a scientific rendering of DNA.

Universality. Participants read an excerpt of a fake article based on real findings in the scientific literature that could be seen as evidence that transgender people have existed throughout human history and continue to exist across many cultures. For example, participants read "Research has suggested that transgender people have existed throughout history and cultures across the world. In one study, led by Dr. Paul Vasey, individuals who identify with a gender that does not align with their biological sex were documented in Samoa," (See S5 of the Supplemental Materials for full article). In Study 2b the article was accompanied by a map of the world with markers of various cultures that have transgender-like identities with the purpose of strengthening the intervention as with the biological essentialism condition.

Measures

Transgender Essentialist Beliefs Scale. Participants completed the same items measuring biological and universality essentialism as in Study 1, as well as three new biological essentialism items (see S2 of the Supplemental Materials). Thus, five items were averaged to form a biological essentialism composite (Study 2a: Cronbach's α = .81, all item total correlations greater than .35; Study 2b: Cronbach's α = .82, all item total correlations greater than .31) and five items were averaged to form a universality composite (Study 2a: Cronbach's α = .72, all item total correlations greater than .32; Study 2b: Cronbach's α = .74, all item total correlations greater than .41).

Feelings Towards Transgender (Relative to Cisgender) People. Next, participants completed the same feeling thermometers from Study 1, resulting in a score representing feelings towards transgender people relative to cisgender people, which was calculated in the same manner as in Study 1.

Pathologizing. Participants then completed three items measuring the extent to which they believed being transgender is an illness (e.g., "Transgender people should seek help from doctors and psychologists to find a cure" 1—Very strongly disagree, 7 – Very strongly agree; α = .91 for Study 2a and α = .93 for Study 2b; See S6 of the Supplemental Materials).

Social Distance. Participants also completed five items (adapted from Bogardus, 1947) gauging how much social contact they would be willing to have with transgender people in a variety of contexts (e.g., To what extent would you be willing to be friends with a transgender person? 1—Not at all, 7 – Very much) which were averaged to form a composite (α = .93 for Study 2a and α = .93 for Study 2b; see S7 of the Supplemental Materials).

Additional measures. Participants completed the same demographic questions from Study 1 (see S1 of the Supplemental Materials for full list). Participants also completed additional questions not reported in the present paper as they were dropped in Study 3 and not relevant to the present research questions (e.g., "Please estimate the percentage of transgender women who are attracted to men"; see S8 of the Supplemental Materials).

Results

Manipulation check. The biological essentialism article did not increase people's biological essentialist beliefs, as there was no significant difference in participants' biological essentialist beliefs between the control condition (M = 4.23, SD = 1.20) and the biological essentialism condition (M = 4.48, SD = 1.15) in Study 2a ($t(208)$ = -1.52, p = .129, d = 0.21) or in Study 2b ($M_{control}$ = 4.38, SD = 1.24, $M_{biological}$ = 4.41, SD = 1.28; $t(226)$ = -0.18, p = .858, d = 0.02), as evidenced by independent-samples t-tests. However, participants' endorsement of universality beliefs was significantly higher in the universality essentialism condition (M = 5.27, SD = 0.94) compared to the control condition (M = 4.72, SD = 0.99), in both Study 2a ($t(206)$ = -4.09, p < .001, d = 0.57) and in Study 2b ($M_{universality}$ = 5.13, SD = 0.95, $M_{control}$ = 4.79, SD = 1.15; $t(227)$ = -2.44, p = .015, d = 0.32), suggesting that the universality article did increase endorsement of universality beliefs.

Essentialism and feelings towards transgender (relative to cisgender) people.

Within both studies, the essentialism manipulation did not appear to have any effect on transprejudice, as single factor ANOVAs showed there were no significant differences between the three conditions on feelings towards transgender people relative to cisgender people for Study 2a (F(2,

309) = 0.60, p = .549, η_p^2 = .004) or Study 2b (F(2, 336) = 0.30, p = .742, η_p^2 = .002), and post-hoc comparisons for both studies (Tukey's HSD, which is used throughout the paper for all post-hoc analyses) did not reveal any significant pairwise comparisons.

Essentialism and pathologizing.

The experimental manipulations also did not appear to have an impact in either study on the extent to which participants believed being transgender is an illness, as single-factor ANOVAs showed that there were no significant differences between the three conditions on pathologizing for Study 2a (F(2, 312) = 1.24, p = .290, η_p^2 = .008) or for Study 2b (F(2, 340) = 0.27, p = .763, η_p^2 = .002), and post-hoc comparisons for both studies did not reveal any significant pairwise comparisons.

Essentialism and closeness.

There was no effect of the essentialism manipulations on how much social contact participants would be willing to have with transgender people, as single-factor ANOVAs showed there were no significant differences between the three conditions on closeness for Study 2a (F(2, 312) = 0.58, p = .559, η_p^2 = .004) or for Study 2b (F(2, 340) = 2.22, p = .111, η_p^2 = .013), and post-hoc comparisons for both studies did not reveal any significant pairwise comparisons.

Additional correlational analyses

Due to the null results of the previous analyses and to see if we could replicate the findings of Study 1 that suggested that the more a person endorses biological essentialism and universality, the less likely they are to show transprejudice, we analyzed correlations between essentialism and feelings towards transgender people relative to cisgender people for both Study 2a and Study 2b. All analyses were collapsed across participant condition. In both studies, participants who endorsed biological essentialist statements more were also less likely to show transprejudice (Study 2a, r(310) = -.27, p < .001; Study 2b, r(337) = -.37, p < .001). Additionally, in both studies, participants who endorsed universality essentialist statements more were less likely to show transprejudice (Study 2a, r(310) = -.38, p < .001; Study 2b, r(337) = -.38, p < .001; see Table 5). Together, these results replicate the correlational findings from Study 1 suggesting essentialism and transprejudice are significantly associated with each other, but directionality and causation remain unclear.

Discussion

In two studies, manipulations meant to impact essentialist beliefs about transgender people had no measurable impact on attitudes toward transgender people. Our manipulation of biological essentialism did not successfully shift biological essentialism beliefs, perhaps because participants already had strong biological essentialist beliefs, as indicated by scores in the control condition and in Study 1, as well as the open-ended question in Study 1 (61% of people mentioned biological essentialist explanations for transgender identities). Therefore, that this manipulation did not impact prejudice is not surprising. We were able to shift participants' views of the universality of transgender identities. However, this change in views about universality resulted in no measurable change in attitudes.

While we saw no changes in prejudice as a result of our manipulations of essentialism, we observed the same correlational relationship between essentialism and prejudice that we observed in Study 1: both stronger endorsement of biological essentialism and universality were associated with warmer feelings towards transgender people relative to cisgender people. Given this association between transgender essentialism and transprejudice and no evidence for causality, we considered the possibility that our manipulations simply were not strong enough to elicit a change in prejudice. However, our attempt to increase the strength of our manipulation (i.e., adding visual cues to the scientific articles in Study 2b) was not effective, despite the fact that similar manipulations using scientific articles have been used to successfully manipulate essentialism in past work with other groups (e.g., Williams & Eberhardt, 2008; Wilton et al., 2019). We then wondered about another possibility: that the causal relationship between transgender essentialism and transprejudice could go in the opposite direction. Indeed, despite attribution theory's suggestion that causal attributions for stigmas lead to prejudice (Weiner et al., 1988), there has been little direct evidence to suggest that this is the case for similarly stigmatized identities, such as for sexual minorities (Hegarty, 2002, 2010, 2020; Hegarty & Golden, 2008). In other words, instead of essentialism leading to prejudice, perhaps prejudice precedes essentialism. To investigate this possibility, we next tested whether experimentally reducing prejudice leads to an increase in essentialism.

Studies 3a and 3b: Investigating a Causal Pathway for Prejudice → Essentialism

In Studies 3a and 3b (again presented together because they are nearly identical), we asked whether the causal pathway between transprejudice and essentialism might instead be reversed—perhaps liking or disliking transgender people causes people to develop more or less essentialized beliefs about transgender people. In two between-subjects studies we tested whether experimentally manipulating prejudice leads to a corresponding change in essentialism. We attempted to reduce prejudice (it would be unethical to increase prejudice) via two different manipulations—imagined contact and outgroup exemplars. Imagined contact (e.g., imagining having a positive interaction with an outgroup member) has been shown in past work to successfully decrease prejudice (Allport, 1954; Crisp et al., 2009). Outgroup exemplar manipulations, which expose participants to positive exemplars of an outgroup that defy negative stereotypes, have also proved successful in reducing prejudice in the past (Dasgupta & Greenwald, 2001; Meirick & Schartel Dunn, 2015). We hypothesized that reducing transprejudice via these manipulations would lead to an increase in transgender essentialism among participants.

Methods

Studies 3a and 3b again utilized a between-subjects experimental design in which participants were randomly assigned to one of three conditions (two conditions for Study 3b as the exemplar condition was removed as it appeared to slightly—though not significantly—increase prejudice in Study 3a)—control, imagined contact, and exemplar—with the goal of examining the impact of different strategies to decrease prejudice toward transgender people on people's essentialist beliefs.

Participants. In Study 3a, we again aimed for a final sample of 300 participants, thus data was collected from slightly over 300 participants to account for exclusions. We recruited 332 U.S. adults through Mechanical Turk on 1/7/2017. Eighteen participants were excluded for not passing an attention check (described in more detail below) while five were excluded for not identifying as cisgender (one participant both did not identify as cisgender and did not pass the attention check) leaving a final sample of N = 310 (188 women, 122 men; M *age* = 38.06, SD *age* = 11.60). In Study 3b, we aimed for a final sample of 200 participants and thus recruited 228 undergraduates from the same subject pool as in Studies 2a and 2b who participated in exchange for extra course credit between 4/19/2017 and 4/28/2017. However, 22 participants were excluded for failing an attention check while four were excluded for not identifying as cisgender (two participants both did not identify as cisgender and did not pass the attention check) leaving a final sample of N = 204 (116 women, 88 men; M *age* = 19.53, SD *age* = 1.36; see Table 1 for demographic information by study).

Materials. All participants were first given the same basic definition of transgender from Study 2a and 2b and then randomly assigned to one of the following three conditions:

Control condition. Participants read only the definition of transgender before moving on to the dependent measures.

Imagined contact condition. Participants completed an imagined contact task adapted from Crisp, Stathi, Turner, and Husnu (2009) in which participants were instructed to "take a minute and imagine yourself meeting a transgender woman for the first time. Imagine that the interaction is positive, relaxed, and comfortable." The "next" button in the survey did not appear for one minute to encourage participants to engage in this task. Then, participants were instructed to "Please take a few moments to write a brief description of what you imagined in full sentences."

Exemplar condition. Participants read a short blurb about a transgender exemplar, Janet Mock, a real, famous transgender woman who meets several cultural standards of success (professionally successful, attractive, married at the time). An image of Mock was paired with the blurb (See S9 of the Supplemental Materials). This condition was removed in Study 3b as it appeared to slightly, though not significantly, increase prejudice in Study 3a, and as a result we felt it would be unethical to continue to use it.

Measures

Feelings Towards Transgender (Relative to Cisgender) People. In Studies 3a and 3b this measure was used as a manipulation check, as it was important to examine the impact on prejudice in the experimental conditions as compared to the control condition in order to observe any subsequent changes in essentialism. Participants completed only the cisgender women and transgender women feeling thermometers from Studies 1 and 2. Aside from this change, the measure was identical to that from previous studies and was calculated in the same manner (transgender scores were subtracted from cisgender scores such that higher numbers indicated more transprejudice).

Transgender Essentialist Beliefs Scale. Participants completed the same biological (Study 3a: Cronbach's α = .91, all item total correlations greater than .49; Study 3b: Cronbach's α = .71, all item total correlations greater than .31, aside from item 3 which was .19) and universality (Study 3a: Cronbach's α = .83, all item total correlations greater than .54; Study 3b: Cronbach's α = .65, all item total correlations greater than .27) essentialism beliefs scale from Studies 2a and 2b (see S2 of the Supplemental Materials). In Studies 3a and 3b, these were the primary dependent variables.

Attention check. Participants responded to the following attention check after completing the study and were excluded if they answered incorrectly based on their assigned condition; "Which of the following did you do at the beginning of the survey?" (Imagine meeting a transgender woman and then write about it, Read about Janet Mock, I did neither of these tasks).

Additional measures. Participants completed the demographic questions from Studies 1 and 2 (see S1 of the Supplemental Materials for full list).

Results

Feelings towards transgender (relative to cisgender) people (manipulation check).

In Study 3a, the experimental manipulations had no effect on transprejudice, as there was no significant difference between the three conditions on feelings towards transgender people relative to cisgender people, as shown by a one-way ANOVA, $F(2, 307) = 0.76$, $p = .468$, $\eta_p^2 = .005$. Post-hoc analyses revealed no significant pairwise comparisons. However, in Study 3b the experimental manipulation did appear to have an effect on feelings towards transgender people relative to cisgender people, as participants in the imagined contact condition expressed significantly less transprejudice (M = 11.08, SD = 17.91) compared to the control condition (M = 17.64, SD = 26.02), as shown by an independent-samples t-test ($t(183.4) = 2.10$, $p = .037$, $d = 0.29$).

Biological essentialism. Within both studies, the experimental manipulations did not appear to have any effect on biological essentialism, as there were no significant differences between the conditions on biological essentialism (Study 3a: $F(2, 307) = 0.13$, $p = .880$, $\eta_p^2 = .001$; Study 3b: $t(202) = -1.37$, $p = .173$, $d = 0.19$; see Table 5). Post-hoc analyses revealed no significant pairwise comparisons.

Universality essentialism. Similarly, the experimental manipulations did not appear to have any effect on universality essentialism in either study, as there were no significant differences between the conditions on universality essentialism (Study 3a: $F(2, 307) = 2.63$, $p = .074$, $\eta_p^2 = .017$;

Study 3b: $t(202) = -0.71$, $p = .481$, $d = 0.10$; see Table 5). Post-hoc analyses revealed no significant pairwise comparisons.

Additional Correlational Analyses

We conducted correlational analyses as in Study 2 to see if we could replicate the significant association between essentialism and transprejudice in Studies 1 and 2. All analyses were again collapsed across condition. In both studies, participants who endorsed biological essentialist statements more were also less likely to show transprejudice, as evidenced by significant correlations between biological essentialism and feelings towards transgender people relative to cisgender people (Study 3a, $r(308) = -.60$, $p < .001$; Study 3b, $r(200) = -.15$, $p = .038$). Additionally in both studies, participants who endorsed universality essentialist statements more were less likely to show transprejudice, as evidenced by significant correlations between universality essentialism and feelings towards transgender people relative to cisgender people (Study 3a, $r(308) = -.51$, $p < .001$; Study 3b, $r(200) = -.17$, $p = .015$; see Table 5).

Discussion

In Studies 3a and 3b, manipulations intended to reduce prejudice towards transgender people did not appear to have an effect on essentialist beliefs about transgender people. Further, our manipulations were not generally successful at reducing prejudice (i.e., negative feelings towards transgender people relative to cisgender people). In Study 3a, neither introducing participants to a transgender exemplar nor having participants imagine meeting a transgender person significantly reduced prejudice. However, in Study 3b, imagined contact did appear to successfully reduce prejudice, though again this resulted in no measurable change in essentialist beliefs about transgender people.

Interestingly, we learned after running the study that there appears to be variability and perhaps a lack of replicability of imagined contact effects (e.g., see Crisp et al., 2014; Hoffarth & Hodson, 2016; Klein et al., 2014); our mixed results mirror the literature on this point. Perhaps there is an uncontrolled moderator resulting in the inconsistencies in the effectiveness of this type of manipulation. Regardless, even when we did find an effect in changing prejudice, we saw no resulting change in essentialism.

Despite these null results, as in Studies 1, 2a, and 2b, we again observed the same relation between transgender essentialism and transprejudice, such that both stronger endorsement of biological essentialism and universality essentialism were associated with lower transprejudice.

Mini Meta-Analysis

Correlation between Essentialism and Feelings towards Transgender (Relative to Cisgender) People

In an attempt to ascertain a better overall effect size estimate of the relationship between transgender essentialism and feelings towards transgender people relative to cisgender people, we ran mini meta-analyses across the five studies (Goh et al., 2016), conducting one each for biological essentialism and universality. These were the only such studies we have run and combining them in a meta-analysis can produce a more accurate estimate for future research. We used a fixed effects approach such that the mean correlations were weighted by the sample size for each study. We first Fisher's z-transformed individual correlations for analyses, but report Pearson correlations here for easier interpretation. We found that the mean correlations between biological essentialism and feelings towards transgender people relative to cisgender people ($M\ r = -.40$, $p < .001$, 95% CI [-.44, -.35]) and universality and feelings towards transgender people relative to cisgender people ($M\ r = -.41$, $p < .001$, 95% CI [-.45, -.36]) were both of medium size and again showed that greater essentialism was associated with less prejudice, overall suggesting a moderate relation between transgender essentialism and transprejudice (see Figures 1 and 2).

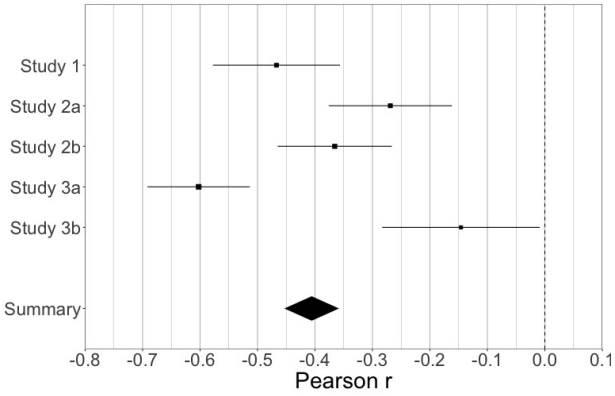

Figure 1. Forest plot showing mini-meta analysis of correlation between biological essentialism and feelings towards transgender relative to cisgender people

The figure shows Pearson's r values for the correlation between biological essentialism and transprejudice for each study as well as the summary meta-analytic value across studies. Black lines indicate 95% confidence intervals.

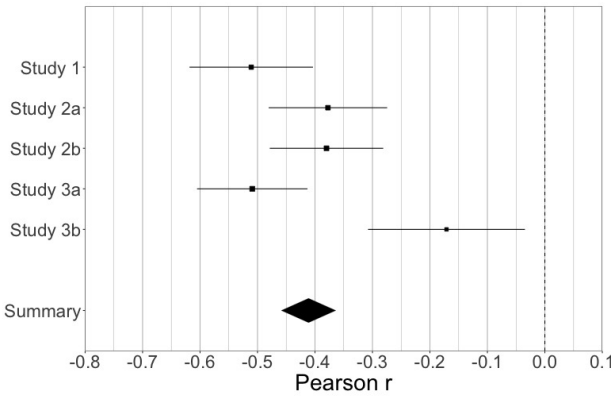

Figure 2. Forest plot showing mini-meta analysis of correlation between universality and feelings towards transgender relative to cisgender people

The figure shows Pearson's r values for the correlation between universality and transprejudice for each study as well as the summary meta-analytic value across studies. Black lines indicate 95% confidence intervals.

Table 6. Results of each manipulation across studies

Manipulation	Condition	DV	Mean (SD)	Statistic
Bio essentialism article		Bio Essentialism		
Study 2a	Bio Essentialism Condition		4.48 (1.15)	$t(208) = -1.52$, $p = .129$, d = 0.21
	Control Condition		4.23 (1.20)	
Study 2b	Bio Essentialism Condition		4.41 (1.28)	$t(226) = -0.18$, $p = .858$, $d = 0.02$
	Control Condition		4.38 (1.24)	
Mini meta-analysis				$M\,d = 0.11$, $p = .247$, 95% CI [-0.08, 0.30]
Universality Article		Universality Essentialism		
Study 2a	Universality Condition		5.27 (0.94)	$t(206) = -4.09$, $p < .001$, $d = 0.57$
	Control Condition		4.72 (0.99)	
Study 2b	Universality Condition		5.13 (0.95)	$t(227) = -2.44$, $p = .015$, $d = 0.32$
	Control Condition		4.79 (1.15)	
Mini meta-analysis				$M\,d = 0.44$, $p < .001$, 95% CI [0.25, 0.63]
Imagined Contact		Feelings towards trans people		
Study 3a	Imagined Contact Condition		16.40 (32.94)	$t(203) = 0.49$, $p = .622$, $d = 0.07$
	Control Condition		18.53 (28.75)	
Study 3b	Imagined Contact Condition		11.08 (17.91)	$t(183.4) = 2.10$, $p = .037$, $d = 0.29$
	Control Condition		17.64 (26.02)	
Mini meta-analysis				$M\,d = 0.18$, $p = .072$, 95% CI [-0.02, 0.37]
Outgroup Exemplar		Feelings towards trans people		
Study 3a	Outgroup Exemplar Condition		21.70 (30.85)	$t(211) = -0.78$, $p = .438$, $d = 0.11$
	Control Condition		18.53 (28.75)	

Efficacy of Manipulations

We also conducted a series of mini meta-analyses to better estimate the overall efficacy of each experimental manipulation used in Study 2a through Study 3b (aside from the outgroup exemplar manipulation, as it was only used once in Study 3a). We again used a fixed effects approach for each analysis, such that the mean effect sizes were weighted by sample size.

The overall effect of the biological essentialism article manipulation was not significant ($M\,d = 0.11$, $p = .238$, 95% CI [-0.08, 0.30]), indicating that this article was not successful at increasing endorsement of biologically essentialist statements about transgender people. In contrast, the overall effect of the universality article manipulation was significant ($M\,d = 0.44$, $p < .001$, 95% CI [0.25, 0.63]) and of small to medium size, indicating that this manipulation was moderately successful at increasing endorsement of statements about the universality of transgender identities. Lastly, the overall effect of the imagined contact manipulation was not significant ($M\,d = 0.18$, $p = .070$, 95% CI [-0.02, 0.37]), indicating that this manipulation was not successful at decreasing negative feelings towards transgender people relative to cisgender people (see Table 6).

General Discussion

We investigated the relationship between transgender essentialism and transprejudice across five studies (one correlational, four experimental including two replications). In Study 1, people provided biological explanations for transgender identities, suggesting that people commonly think about the etiology of transgender identities in biologically essentialist ways, and providing a basis for further empirical study of transgender essentialism as a construct. Study 1 also showed initial evidence that more essentialism of transgender identities is associated with less transprejudice. In Studies 2a and 2b, we next investigated the potential casual pathway of transgender essentialism leading to transprejudice. However, our manipulations did not consistently impact transgender essentialism in participants. Both attempts at modifying biological essentialism failed, and though we were able to impact universality, neither manipulation impacted transprejudice. However, we again detected a negative relationship between transgender essentialism and transprejudice such that stronger endorsement of both biological essentialism and universality were associated with warmer feelings towards transgender people relative to cisgender people. Finally, in Studies 3a and 3b, we investigated the reverse causal pathway of Studies 2a and 2b, testing the possibility that a change in prejudice would lead to a change in essentialism. We again found mixed success with our manipulations and no evidence for a causal relationship. We were unsuccessful at using positive exemplars to change attitudes toward trans people, while we found mixed evidence for imagined contact. Yet, we again

replicated the relation between transgender essentialism and transprejudice from the previous studies. An internal meta-analysis of the manipulation checks across Studies 2a to 3b suggested that the universality article manipulation may have been the only manipulation to successfully impact the targeted construct (universality beliefs), showing a small to medium effect. An additional internal meta-analysis suggested that the relationship between transgender prejudice and transgender essentialism (both biological and universality) was of moderate size.

Overall, these data add to the existing literature on the relationship between essentialism and prejudice by exploring a novel type of essentialism focused on an understudied, marginalized group. Across all five studies, a clear and consistent finding is that stronger endorsement of both biological essentialism and universality was associated with lower transprejudice (i.e., warmer feelings towards transgender people relative to cisgender people). This suggests that, in the domain of transgender identity, the relationship between essentialism and prejudice may operate more similarly to that of sexual minorities rather than to that of other social categories such as race and gender (where greater essentialism is associated with more prejudice), perhaps due to a "born this way" narrative sometimes used in U.S.-based pro-LGBT groups (especially at the time of data collection) and a narrative that some (though not all) transgender people say describes their experiences (e.g., Jennings, 2017; Mock, 2014), leading many people to perceive essentialist beliefs about sexual and gender minorities as inherently pro-LGBT. This finding is particularly interesting in light of the small body of work that has examined the relationship between other types of essentialism and transprejudice. That work has found that greater endorsement of gender essentialism (i.e., focusing on differences between men and women; nothing about transgender people) is associated with more transprejudice (Ching & Xu, 2018; Wilton et al., 2019). One limitation of the current work is that *gender* essentialism (that is, essentialism of differences between men and women) was not measured, and thus we are not able to speak directly to the relationship between gender essentialism and transprejudice in the current studies. However, in light of our Study 1 findings showing that U.S. adults spontaneously think about the etiology of transgender identities in biologically essentialist ways, it is logical that the relationship between gender essentialism and transprejudice in particular might be the reverse of the relationship between transgender essentialism and transprejudice. This is because the transgender essentialist belief that someone is born with a different gender identity than the one expected based on their sex assigned at birth is in direct contrast to *gender* essentialist ideas (e.g., gender is inherently linked to biological sex, male and female are discrete categories). These findings highlight not only the importance of considering the relationship between essentialism and prejudice across multiple domains, but considering different operationalizations of essentialism and prejudice as well.

What remains unclear is what drives the relationship between transgender essentialism and transprejudice. In the present research, we investigated two causal pathways—examining whether transgender essentialism leads to transprejudice and whether transprejudice leads to transgender essentialism. Unfortunately, we generally failed to manipulate the variables of interest and as a result found no impact on the dependent variables. One potential explanation for these null results is that our manipulations simply were not strong enough. Internal meta-analyses of the manipulation checks confirm this problem; only the universality manipulation was effective. One reason the manipulations may not have been effective was that some participants may have simply guessed the purpose of the manipulations in the current work and reacted against it. In past work on this topic using faux scientific articles, the researchers used cover stories or additional stimuli to obscure the purpose of the study (Williams & Eberhardt, 2008). In regard to imagined contact manipulations, as mentioned previously, there have been mixed findings about whether these manipulations work (Crisp et al., 2014; Hoffarth & Hodson, 2016; Klein et al., 2014). Moreover, studies employing successful exemplar manipulations have sometimes used multiple exemplars (e.g., Dasgupta & Greenwald, 2001) or longer length of exposure (e.g., Meirick & Schartel Dunn, 2015), so it may be that our manipulation was not strong enough in this regard. Another limitation of our design was that participants in the control conditions did not complete a comparable task, making them a less ideal comparison group, though why this would lead to null differences between conditions is unclear. In sum, our belief is that to adequately address these questions in the future, stronger manipulations will be necessary, perhaps including more active and immersive elements.

Our only successful manipulation according to our mini meta-analysis was the universality manipulation. Universality may have been easier to modify because people came into the study with strong biological essentialist beliefs (as suggested by Study 1, in which a majority of participants spontaneously offered biological essentialist explanations for what causes someone to be transgender), whereas perhaps universality arguments were new to them. It may be important for future work seeking to increase transgender essentialism to target particularly novel information.

However, lack of familiarity with universality perspectives still does not explain why the change in essentialist beliefs in the universality condition did not reflect a corresponding change in prejudice. It is conceivable that a completely distinct variable—or variables—may explain the relationship between essentialism and prejudice. Mandalaywala (2020) argues that essentialism may be indirectly rather than directly related to prejudice, such as through social information like stereotypes (e.g., Lepore & Brown, 1997; Putra et al., 2018). Perhaps the universality manipulation in Studies 2a and 2b, though successful at manipulating essentialism, was not successful at targeting the stereotypes about transgender people that were then subsequently linked to or even causing transprejudice. Another possibility is that, in contrast to attribution theory, changes in essentialist beliefs that evoke causal attributions for stigmatized identities do not lead to changes in attitudes in the context of transgender identity. Indeed, Hegarty (2020) argues that, in regard to sexual minorities, there has been very little "strong" evidence to support a direct causal link between essentialist beliefs and attitudes.

Though primarily referring to biological beliefs, Hegarty asserts that causal attributions for stigma may actually instead be influenced by attitudes and group identities. For example, Hegarty (2002) showed that the belief that sexual orientation is immutable and more positive attitudes towards sexual minorities were only related when participants believed that immutability beliefs were pro-LGBT. In the present work, though we found no evidence that attitudes lead to essentialist beliefs—possibly due to the efficacy of our manipulations—it is still possible that this causal relation exists.

It is also important to consider the context in which these studies took place. At the time of data collection, transgender rights and issues were at a crescendo in public discourse. This could have influenced the results if participants came into the studies with strong pre-existing attitudes and beliefs about transgender people, possibly catalyzed and primed by recent public discourse. Perhaps if conducted during a time in which transgender people and issues were less at the forefront of public debate, people would have been more open to changing their etiological beliefs. Additionally, our samples had a liberal bias, as only between 3% and 24% of participants identified as either *conservative* or *very conservative* across each of the five studies (see Table 1). Even though the majority of participants did not report personally knowing a transgender person, they may have already held more favorable views towards transgender people on average, making it more difficult to observe meaningful changes in participant's views.

An additional limitation of the current work is that we considered a relatively limited scope of transgender essentialism, focusing only on the biological essentialism and universality dimensions from the work of Haslam and Levy (2006) on homosexuality. Perhaps focusing on another domain of essentialism, such as discreteness, would have yielded different results. Second, our understanding of transgender essentialism in the work may also be limited by focusing on only binary-identifying transgender people, rather than nonbinary people. At the time these studies were run there was much less public discussion of nonbinary identities, though perhaps that would have been a useful group to study since attitudes may have been more pliable.

In summary, these studies provide a few key insights to our understanding of essentialism and prejudice toward transgender identities. Across all five studies, we found consistent evidence that the more that people endorse transgender essentialist beliefs, the less prejudice they are likely to show towards transgender people. In this way, the relationship between essentialism and prejudice in the domain of transgender identity is more similar to sexual minorities than to other social categories such as race and gender. Additionally, we had difficulty manipulating transgender essentialism or prejudice and as a result, found no evidence for a manipulation of one affecting the other. Future research would benefit by developing strong manipulations and then assessing their impact on the other construct.

Contributions

Contributed to conception and design: EMG, KRO
Contributed to acquisition of data: EMG
Contributed to analysis and interpretation of data: JJG, EMG, KRO
Drafted and/or revised the article: JJG, KRO, EMG
Approved the submitted version for publication: JJG, EMG, KRO

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Competing Interests

The authors declare no competing interests.

Data Accessibility Statement

The datasets and analysis scripts for all five studies can be found online on this paper's project page on the Open Science Framework (https://osf.io/xfr9w/?view_only=87e370ef9f6b4b1ea04e1c2bc37c7023).

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