# Perceptual Differences Fully Crossed Replication

Using a methodology that has been validated by past work, in Study 2 participants represented transwomen as less like their expressed gender than ciswomen, regardless of perceiver gender. In the present study, we sought to replicate the finding that participants perceived targets labeled as transgender as less-gender congruent than the same targets without the transgender label. We aimed to do so with a larger sample and utilizing a fully crossed 2 (*perceiver gender*) x 2 (*target gender*) x 2 (*transgender label*) design.

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As an exploratory aim in this replication, we explored potential differences in men and women’s attitudes toward male and female transgender targets. We later predicted that perceptual differences might occur to the greatest extent among people with negative transgender attitudes (see Study 3), so in the present work we sought to determine who has the most negative attitudes and whether those attitudes differ between transgender male and female targets. Attitudes toward transgender individuals are typically less favorable among heterosexual men than women (Norton & Herek, 2013). Further, men exhibit higher transphobia than women (Nagoshi et al., 2008) and men are less accepting of transgender individuals in gendered spaces than are women (White & Jenkins, 2017). However, this past work exploring gender differences in attitudes towards transgender individuals has not examined transgender men and women separately. Therefore, we tested for gender differences in attitudes towards transgender male and transgender female targets.

# Method

Six-hundred and forty-two heterosexual Amazon Mechanical Turk workers participated in an online study for $0.60. We aimed to recruit approximately 650 participants to obtain 80% power for three-way interactions using an estimated small effect size (*f* = 0.11). Participants (*n* =

13) were excluded from analyses if they incorrectly answered three or more attention check questions, resulting in a final sample of 629 participants (*Mage* = 36.12, *SDage* = 10.93; 50.4% women; 76.2% White).

Participants were randomly assigned to see a profile of a White man (n = 312) or woman (n = 317). They saw a photograph of an individual paired with some information about them. In half of the profiles the target identified as male or female (n = 321). In the other half, the target identified as a transgender male or transgender female (n = 308). Each participant viewed one profile. Two other pieces of profile information (e.g., hobbies) were held constant across conditions.

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After viewing the profile, participants completed the visual matching task from Study 2. Participants indicated which face from an array of faces matched the target’s real face. We coded participants’ choices on a -5 (*face most like prototypical member of assumed natal sex group*) to 5 (*face most like prototypical member of gender identity group*) scale where 0 represented the true face. We recorded the duration of time participants spent making their selection and how confident they were in their choice from 0 (*not at all confident*) to 100 (*completely confident*).

Participants then reported their attitudes toward the target on a 0 (*cold*) to 100 (*warm*) feelings thermometer, which previous research has utilized to explore attitudes towards sexual minorities (Norton & Herek, 2013). Participants also completed attention checks where they recalled information included in the profile. Finally, participants reported demographic information, were probed for suspicion of the hypotheses, and were thanked and debriefed.

# Results Perceptual Differences

We conducted a 2 (*perceiver gender*) x 2 (*target gender*) x 2 (*transgender label*) between-subjects *ANOVA* to test for differences among groups on representations of the target face. As predicted, there was a main effect of the transgender label. Participants perceived the targets labeled as transgender (*M* = 0.26, *SD* = 2.27) as less like gender-congruent than the same

targets without the transgender label (*M* = 0.64, *SD* = 2.45), *F*(1, 618) = 4.05, *p* = .045, *η 2*

*p*

= 0.01

(95% CI 0.01 to 0.02; Figure 1). There was also a main effect of target gender such that participants perceived the woman as less like her gender identity (*M* = 0.25, *SD* = 2.44)

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compared to the man (*M* = 0.66, *SD* = 2.28), *F*(1, 618) = 4.59, *p* = .03, *η 2*

*p*

= 0.01 (95% CI, 0.01

to 0.03), regardless of the transgender label. There was no significant main effect for perceiver gender, *F*(1, 618) = 3.01, *p* = .08, nor were there significant two-way interactions or three-way interactions, *p*’s *>* .39*.*

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*Figure 1.* Targets in the transgender condition were perceived as less gender-congruent than

targets in the control condition. Error bars represent standard error.

There were no differences among groups regarding how confident participants felt in their selections, *p*’s > .14. There was a main effect of target gender in that participants spent

more time choosing the morph for the woman (*M* = 42.06, *SD* = 27.46) than the man (*M* = 35.76,

*SD* = 22.00), *F*(1, 615) = 10.18, *p* = .001, *η 2*

*p*

= 0.021

(95% CI 0.002 to 0.041). There was no

main effect for perceiver gender, *F*(1, 621) = 0.11, *p* = .75, or the transgender label, *F*(1, 621) = 0.74, *p* = .39, nor any two-way or three-way interactions in how long participants spent identifying the morph, *p*’s > .29.

# Attitudes

We conducted a 2 (*perceiver gender*) x 2 (*target gender*) x 2 (*transgender label*) between-subjects *ANOVA* to test whether the transgender label elicited differences in attitudes based on perceiver and target gender (Figure 2). There was a three-way interaction among

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predictors, *F*(1, 621) = 10.56, *p* = .001, *η 2*

*p*

= 0.02 (95% CI, 0.003 to 0.042), such that the two-

way interaction between target gender and transgender label was significant for male

participants, *F*(1, 306) = 10.99, *p* = .001, *η 2*

*p*

= 0.04 (95% CI, 0.01 to 0.08), but not for female

participants, *F*(1, 315) = 1.42, *p* = .23. Specifically, while men reported no differences in attitudes towards cisgender and transgender male targets, *F*(1, 148) = 1.32, *p* =.25, they reported more negative attitudes towards the transgender female target (*M* = 55.53, *SD* = 27.08) than the

cisgender female target (*M* = 69.12, *SD* = 20.37), *F*(1, 158) = 12.92, *p* < .001, *η 2*

*p*

= 0.08 (95%

CI, 0.02 to 0.16). Further, male participants reported more favorable attitudes toward cisgender women (*M* = 69.12, *SD* = 20.37) than cisgender men (*M* = 46.94, *SD* = 22.99), *F*(1, 157) =

41.56, *p* < .001, *η 2*

*p*

= 0.21 (95% CI, 0.11 to 0.31), but reported no differences in attitudes toward

transgender women and transgender men, *F*(1, 149) = 0.90, *p* = .35. We have conceptualized

1. Six participants were greater than three standard deviations above the mean on time spent on the perception task and were excluded from analyses. Inclusion of these participants still results in a significant main effect of target gender, *F*(1, 621) = 7.82, *p* = .01, and no other main effects or interactions.

attitudes as a predictor of perceptual differences rather than an outcome. Indeed, there is no relationship between perception and attitudes *r*(626) = -.02, *p* = .59.



*Figure 2.* Attitudes toward targets.

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In the present study, women reported no differences in attitudes toward a transgender and cisgender target, regardless of whether the target was a man or woman. While men similarly reported no attitude differences between a transgender and cisgender man, they did report more favorable attitudes toward the cisgender female target compared to the transgender female target. These findings replicate some past work suggesting than men, more so than women, hold negative attitudes toward transgender individuals (Norton & Herek, 2013). However, the present results suggest that men may only hold more negative attitudes toward transgender women, not transgender men. It is important to note that in this study participants reported attitudes toward one target – not transgender individuals broadly – using one item.

References

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# Individual Difference Moderation Analyses (Study 3)

At Time 1 of Study 3, participants responded to a variety of individual difference scales, all of which were answered using a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). Participants reported their attitudes towards transgender individuals (e.g., “Being transgender is unnatural and immoral”) on a four-item scale (adapted from Walch, Ngamake, Francisco, Stitt,

& Shingler, 2012; α = .81). Participants completed a short form 10-item Gender Role Beliefs Scale (GRBS; adapted by Brown and Gladsone, 2012; Kerr & Holden, 1996; α = .86). This scale measures attitudes about traditional gender roles (e.g., “Women with children should not work outside the home if they don’t need to financially”). Participants’ beliefs about the instability of manhood were measured via a six-item precarious manhood scale (Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008; α = .79). This scale included items such as, “A man needs to prove his masculinity.” The degree to which participants felt they understand what gender is was assessed via a seven-item gender concept clarity (GCC) scale (Chavez, 2013; α = .84) including items such as, “How clear to you is your view of what gender is?” GCC was assessed from 1 (*not at all*) to 7 (*very much*). Finally, participants responded to a lab-developed essentialism scale to assess the degree to which participants believe gender identity is essentialized. Gender identity essentialism was assessed across three items (α = .87) and included statements such as, “If you are either male or female you are that gender for all time.”

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**Moderators of perceptual differences.** Finally, we tested whether some people are more likely to exhibit perceptual differences than others. We conducted a series of hierarchical multiple regression analyses predicting the morph photo chosen. Experimental condition was effects coded (control = -1, transgender = 1) and entered into the model along with the target chosen (Target 1 = 0 or Target 2 = 1), the moderator (mean-centered), and all interaction terms.

The three-way interaction term tested for a moderated moderation, meaning that the association between the transgender label and perceptual misgendering was not only dependent on individual differences, but also on which target was selected. If the three-way interaction term was nonsignificant, only the predicted two-way interaction between the anticipated moderator and condition was probed.

We examined gender essentialism as a moderator for the relationship between the transgender label and perceptual differences. The overall model was significant; however, the three-way interaction among predictors was not significant (Table 1). Although the three-way interaction among predictors was not significant, we probed the trending two-way interactions between essentialism and condition for targets separately because there was only perceptual differences for Target 2. Comparison by target chosen showed no interaction between essentialism and condition for Target 1, *b* = 0.01, *t*(124) = 0.09, *p* = .93. However, there was a marginal interaction between essentialism and condition for Target 2, *b* = -0.34, *t*(94) = -1.90, *p*

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= .05, such that individuals higher in essentialism exhibited perceptual differences, *b* = -1.87, *p* =

.002 (95% CI, -2.07 to -0.49) (Figure 3).



*Figure 3.* Simple slopes of the transgender label predicting perceptual differences for 1 *SD* below the mean of essentialist beliefs and 1 *SD* above the mean of essentialist beliefs for both targets.

\**p* < .05.

We examined precarious manhood as a moderator of the relationship between the transgender label and perception. The overall model was significant and there was a significant three-way interaction between predictor terms (Table 1). Comparison by target chosen showed the overall model was significant for Target 2, *F*(3, 94) = 3.37, *p* = .02. There was no interaction between precarious manhood and condition for Target 2, *b* = -0.38, *t*(94) = -1.57, *p* = .12. However, in probing the trending interaction for Target 2, only individuals higher in precarious manhood exhibited perceptual differences, *b* = -1.18, *p* = .005 (95% CI, -2.00 to -0.37) (Figure

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*Figure 4.* Simple slopes of the transgender label predicting perceptual differences for 1 *SD* below the mean of precarious manhood and 1 *SD* above the mean of precarious manhood. \**p* < .05.

We then examined attitudes towards transgender individuals as a moderator of the

relationship between the transgender label and perception. The overall model was significant; however, the three-way interaction was not significant, nor was the two-way interaction between transgender attitudes and condition, suggesting that attitudes towards transgender individuals did not moderate the relationship between the transgender label and perception.

We examined whether gender role beliefs moderated the relationship between the transgender label and perception. The overall model was significant and the three-way interaction between predictor terms was significant. The overall model for Target 1 was not significant, *F*(3, 127) = 2.18, *p* = .09. The overall model for Target 2 was significant, *F*(3, 94) = 2.94, *p* = .04. However, there was no significant interaction between condition and gender roles, *b* = -0.30, *t*(94) = -1.10, *p* = .28.

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Finally, we examined gender concept clarity (GCC) as a moderator of the relationship between the transgender label and perception. The overall model was significant; however, the three-way interaction was not significant, nor was there a significant interaction between gender concept clarity and condition, suggesting that gender concept clarity did not moderate the relationship between the transgender label and perception.

Table 1.

*Regression analyses exploring the moderating role of individual difference factors on the association between the transgender label and perceptual differences*

Predictor Unstandardized coefficient

Standardized coefficient *p F R2*

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *B* | *SE* | β |  |
| **Essentialism (ESS)** |  |  |  |  | 3.48 | .07 |
| Constant | 0.52 | 0.24 |  | .03\* |  |  |
| Condition | 0.02 | 0.24 | .01 | .94 |  |  |
| Target | 1.22 | 0.36 | .22 | .001\* |  |  |
| ESS | 0.13 | 0.15 | .06 | .40 |  |  |
| Target x Cond | -0.70 | 0.36 | -.17 | .05\* |  |  |
| Target x ESS | -0.01 | 0.18 | -.004 | .95 |  |  |
| Cond x ESS | 0.01 | 0.13 | .01 | .94 |  |  |
| Cond x ESS x Target | -0.34 | 0.21 | -.14 | .10 |  |  |
| **Precarious Manhood (PM)** |  |  |  |  | 3.67 | .08 |
| Constant | 0.47 | 0.24 |  | .05\* |  |  |
| Condition | -0.02 | 0.24 | .01 | .94 |  |  |
| Target | 1.18 | 0.36 | .21 | .001 |  |  |
| PM | 0.23 | 0.20 | .10 | .24 |  |  |
| Target x Cond | -0.71 | 0.36 | -.17 | .05\* |  |  |
| Target x PM | -0.12 | 0.30 | .08 | .70 |  |  |
| Cond x PM | 0.19 | 0.20 | .08 | .33 |  |  |
| Cond x PM x Target | -0.57 | 0.30 | -.16 | .06 |  |  |
| **Attitudes** |  |  |  |  | 3.16\* | .06 |
| Constant | 0.53 | 0.24 |  | .03\* |  |  |
| Condition | 0.02 | 0.24 | .01 | .92 |  |  |
| Target | 1.20 | 0.36 | .22 | .001\* |  |  |
| Attitudes | -0.17 | 0.16 | -.09 | .30 |  |  |
| Target x Cond | -0.73 | 0.36 | -.18 | .04\* |  |  |
| Target x Attitudes | 0.40 | 0.25 | .14 | .11 |  |  |
| Cond x Attitudes | -0.03 | 0.16 | -.02 | .85 |  |  |
| Cond x Attitudes x Target | 0.07 | 0.25 | .02 | .80 |  |  |
| **Gender Roles (GR)** |  |  |  |  | 4.01\* | .09 |
| Constant | 0.43 | 0.24 |  | .07 |  |  |

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Condition | -0.02 | 0.24 | -.01 | .94 |  |
| Target | 1.30 | 0.36 | .23 | <.001\* |
| GR | 0.20 | 0.20 | .08 | .33 |
| Target x Cond | -0.71 | 0.36 | -.17 | .05 |
| Target x GR | -0.38 | 0.33 | -.09 | .26 |
| Cond x GR | 0.40 | 0.20 | .16 | .05 |
| Cond x GR x Target | -0.71 | 0.33 | -.18 | .03\* |
| **GCC** |  |  |  |  | 3.13\* | .05 |
| Constant | 0.51 | 0.24 |  | .03\* |  |  |
| Condition | 0.04 | 0.24 | .01 | .87 |  |  |
| Target | 1.21 | 0.36 | .22 | .001\* |  |  |
| GCC | 0.07 | 0.19 | .03 | .71 |  |  |
| Target x Cond | -0.77 | 0.36 | -.18 | .04\* |  |  |
| Target x GCC | 0.05 | 0.29 | .01 | .87 |  |  |
| Cond x GCC | 0.16 | 0.19 | .07 | .39 |  |  |
| Cond x GCC x Target | -0.39 | 0.29 | -.12 | .18 |  |  |
| \**p* < .05 |  |  |  |  |  |  |  |

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# Perception, Evaluations, Attitudes, and Behaviors Across Time (Study 3)

Study 3 was a two-part study. At Time 1, participants completed the morphing visual matching task for two targets. Further, to assist with the ostensible “dating evaluations” cover story, participants also reported evaluations of the target along with attitudes and likelihood of behavioral engagement. They completed the individual difference measures outlined in the Study 3 main text. Finally, they picked the target who they liked the best. At Time 2, they saw the target they chose in Time 1, learned she was either transgender or not, completed the visual matching task again, and reported evaluations of the target. The hypotheses of the present work primarily focused on the between-subjects effects of participants’ perceptions and evaluations at Time 2, after they had demonstrated an interest in a particular target and at the point at which our experimental manipulation took place. However, here we have included exploratory analyses examining whether participants’ perceptions, evaluations, attitudes, and behavioral intentions differed between Time 1 and Time 2. Particularly of interest is whether responses changed between Time 1 and Time 2 for individuals in the transgender condition. That is, did learning someone is transgender at Time 2 alter initial impressions formed at Time 1?

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We tested the three-way and two-way interactions among predictors along with the main effects for each analysis. For the sake of brevity, we will only report significant effects here. **Perceptual Differences**

To test whether perceptions of gender prototypicality changed between Time 1 and Time 2, we conducted a 2 (*target chosen*) x 2 (*transgender label*) x 2 (*time*), mixed *ANOVA* on participants’ responses to the visual matching measure. There was a marginal three-way

interaction between time, condition, and target, *F*(1, 221) = 3.88, *p* = .05, *η 2*

*p*

= 0.02 (95% CI,

0.00 to 0.07). There was a significant time by condition interaction for Target 2, *F*(1, 96) = 5.77,

*p* = .03, *η 2*

*p*

= 0.05 (95% CI, 0.001 to 0.164). While there was no significant difference in

masculinity of morph chosen at Time 1 and Time 2 in the transgender condition, *F*(1, 45) = 0.68,

*p* = .41, participants in the control condition chose a significantly less masculine face at Time 2

(*M* = 2.44, *SD* = 2.60) than Time 1 (*M* = 0.44, *SD* = 1.94), *F*(1, 51) = 25.87, *p* < .001, *η 2*

*p*

= 0.34

(95% CI, 0.13 to 0.50). There was no significant time by condition interaction for Target 1, *F*(1,

125) = 0.22, *p* = .64. There was a significant main effect for time, such that participants overall chose a less masculine morph at Time 2 (*M* = 1.05, *SD* = 2.76) than Time 1 (*M* = 0.12, *SD* =

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2.04), *F*(1, 221) = 17.01, *p* < .001, *η 2*

*p*

= 0.07 (95% CI, 0.02 to 0.14).

# Evaluations

**Warmth***.* We next examined whether reported warmth toward the target changed across time between target or condition. There was a significant interaction between time and condition,

*F*(1, 224) = 23.19, *p* < .001, *η 2*

*p*

= 0.09 (95% CI, 0.03 to 0.17). Participants evaluated the control

target as warmer at Time 2 (*M* = 5.63, *SD* = 1.02) than at Time 1 (*M* = 4.56, *SD* = 1.06), *F*(1,

114) = 117.34, *p* < .001, *η 2*

*p*

= 0.51 (95% CI, 0.38 to 0.60). Participants also evaluated the

transgender target as warmer at Time 2 (*M* = 4.99, *SD* = 1.04) than at Time 1 (*M* = 4.62, *SD* =

1.02), but not to the same extent, *F*(1, 110) = 10.28, *p* = .002, *η 2*

*p*

= 0.09 (95% CI, 0.01 to 0.19).

There was a significant main effect for time, such that participants overall evaluated the target as warmer at Time 2 (*M* = 5.32, *SD =* 1.08) than Time 1 (*M* = 4.59, *SD* = 1.04), *F*(1, 221) = 17.01,

*p* < .001, *η 2*

*p*

= 0.07 (95% CI, 0.02 to 0.14). Further, there was a main effect for condition such

that participants evaluated the cisgender target (*M* = 5.09, *SD* = .88) as warmer than the

transgender target (*M* = 4.81, *SD* = .84) across time, *F*(1, 224) = 6.50, *p* = .01, *η 2*

*p*

= 0.03 (95%

CI, 0.001 to 0.083).

**Competence***.* Next, we examined whether reported competence of the target changed across time between target or condition. There was a significant main effect for time, *F*(1, 224) =

4.11, *p* = .04, *η 2*

*p*

= 0.02 (95% CI, 0.00 to 0.07), such that participants evaluated the target to be

more competent at Time 2 (*M* = 4.51, *SD* = 0.75) than at Time 1 (*M* = 4.40, *SD* = 0.83).

**Attractiveness**. We then explored whether attractiveness varied between target or condition across time. There was a significant three-way interaction between time, target, and

condition, *F*(1, 224) = 4.41, *p* = .04, *η 2*

*p*

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= 0.02 (95% CI, 0.00 to 0.07). There was a significant

time by condition interaction for Target 1, *F*(1, 128) = 9.08, *p* = .003, *η 2*

*p*

= 0.07 (95% CI, 0.01 to

0.16), such that there were no differences between Time 1 and Time 2 reported attractiveness in the control condition, *F*(1, 63) = 1.65, *p* = .20, but participants evaluated the target in the transgender condition as less attractive at Time 2 (*M* = 4.59, *SD* = 1.66) than at Time 1 (*M* =

5.18, *SD* = 1.37), *F*(1, 65) = 7.80, *p* = .01, *η 2*

*p*

= 0.11 (95% CI, 0.01 to 0.26). There was also a

significant time by condition interaction for Target 2, *F*(1, 96) = 28.35, *p* < .001, *η 2*

*p*

= 0.23 (95%

CI, 0.10 to 0.36). Participants evaluated the control target to be marginally more attractive at Time 2 (*M* = 5.58, *SD* = 1.19) compared to Time 1 (*M* = 5.27, *SD* = 1.25), *F*(1, 51) = 3.34, *p* =

.07, but evaluated the transgender target as significantly less attractive at Time 2 (*M* = 4.07, *SD* =

1.63) compared to Time 1 (*M* = 5.37, *SD* = 1.16), *F*(1, 45) = 25.20, *p* < .001, *η 2*

*p*

= 0.36 (95% CI,

0.14 to 0.53). There was a significant main effect for time, such that participants overall evaluated the target as less attractive at Time 2 (*M* = 5.02, *SD =* 1.58) than Time 1 (*M* = 5.33, *SD*

= 1.20), *F*(1, 224) = 12.43, *p* = .001, *η 2*

*p*

= 0.05 (95% CI, 0.01 to 0.12). There was a main effect

of condition such that the transgender target (*M* = 4.80, *SD* = 1.19) was evaluated as less

attractive than the control target (*M* = 5.52, *SD* = 1.00), *F*(1, 224) = 23.46, *p* < .001, *η 2*

*p*

= 0.10.

**Femininity**. We then explored whether self-reported target femininity varied between target or condition across time. There was a significant three-way interaction between time,

target, and condition, *F*(1, 224) = 4.57, *p* = .03, *η 2*

*p*

= 0.02 (95% CI, 0.00 to 0.07). There was a

significant time by condition interaction for Target 1, *F*(1, 128) = 5.70, *p* = .02, *η 2*

*p*

= 0.04 (95%

CI, 0.001 to 0.128), such that there were no differences between Time 1 and Time 2 reported femininity in the control condition, *F*(1, 63) = 0.50, *p* = .48, but participants evaluated the target in the transgender condition as less feminine at Time 2 (*M* = 4.79, *SD* = 1.42) than at Time 1 (*M*

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= 5.26, *SD* = 1.32), *F*(1, 65) = 6.38, *p* = .01, *η 2*

*p*

= 0.09 (95% CI, 0.003 to 0.234). There was also

a significant time by condition interaction for Target 2, *F*(1, 96) = 24.00, *p* < .001, *η 2*

*p*

= 0.20

(95% CI, 0.08 to 0.33). Participants evaluated the control target to be marginally more feminine at Time 2 (*M* = 5.65, *SD* = 1.01) compared to Time 1 (*M* = 5.33, *SD* = 1.13), *F*(1, 51) = 3.34, *p* =

.07, but evaluated the transgender target as significantly less feminine at Time 2 (*M* = 4.35, *SD* =

1.49) compared to Time 1 (*M* = 5.39, *SD* = 1.18), *F*(1, 45) = 22.12, *p* < .001, *η 2*

*p*

= 0.33 (95% CI,

0.12 to 0.50). There was a significant main effect for time, such that participants overall evaluated the target as less feminine at Time 2 (*M* = 5.15, *SD =* 1.39) than Time 1 (*M* = 5.39, *SD*

= 1.24), *F*(1, 224) = 8.46, *p* = .004, *η 2*

*p*

= 0.04 (95% CI, 0.004 to 0.096). There was a main effect

of condition such that the transgender target (*M* = 4.95, *SD* = 1.13) was evaluated as less

feminine than the control target (*M* = 5.56, *SD* = .97), *F*(1, 224) = 19.09, *p* < .001, *η 2*

*p*

= 0.08

(95% CI, 0.02 to 0.15).

**Masculinity**. Next, we examined whether self-reported masculinity varied between target or condition across time. There was a significant three-way interaction between time, target, and

condition, *F*(1, 224) = 13.07, *p* < .001, *η 2*

*p*

= 0.06 (95% CI, 0.01 to 0.12). There was a significant

time by condition interaction for Target 2, *F*(1, 96) = 25.68, *p* < .001, *η 2*

*p*

= 0.21 (95% CI, 0.08 to

0.34). Participants evaluated the control target to be less masculine at Time 2 (*M* = 2.52, *SD* =

1.23) compared to Time 1 (*M* = 3.08, *SD* = 1.57), *F*(1, 51) = 10.21, *p* = .002, *η 2*

*p*

= 0.17 (95% CI,

0.02 to 0.34), but evaluated the transgender target as significantly more masculine at Time 2 (*M*

= 3.57, *SD* = 1.56) compared to Time 1 (*M* = 2.41, *SD* = 1.45), *F*(1, 45) = 14.78, *p* < .001, *η 2* =

*p*

0.25 (95% CI, 0.06 to 0.43). There was no significant time by condition effect for Target 1, *F*(1,

128) = 0.37, *p* = .54. There was a significant main effect for time, such that participants overall evaluated the target as more masculine at Time 2 (*M* = 2.92, *SD =* 1.41) than Time 1 (*M* = 2.73,

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*SD* = 1.47), *F*(1, 224) = 4.28, *p* = .04, *η 2*

*p*

= 0.02 (95% CI, 0.00 to 0.07). There was a main effect

of condition such that the transgender target (*M* = 3.01, *SD* = 1.68) was evaluated as more

masculine than the control target (*M* = 2.65, *SD* = 1.63), *F*(1, 224) = 5.56, *p* = .02, *η 2*

*p*

= 0.02

(95% CI, 0.0004 to 0.0765).

# Attitudes

We then explored whether participants’ attitudes toward the target varied between condition or target across time. There was a significant two-way interaction between time and

condition, *F*(1, 224) = 21.34, *p* < .001, *η 2*

*p*

= 0.09 (95% CI, 0.03 to 0.16), such that participants

reported more favorable attitudes toward the control target at Time 2 (*M* = 73.88, *SD* = 18.85)

than at Time 1 (*M* = 63.12, *SD* = 19.37), *F*(1, 114) = 40.05, *p* < .001, *η 2*

*p*

= 0.26 (95% CI, 0.13 to

0.38). However, participants reported no differences in attitudes toward the transgender target between Time 1 and 2, *F*(1, 110) = 0.15, *p* = .70. There was a main effect of condition such that participants reported less favorable attitudes toward the transgender target (*M* = 60.26, *SD* =

24.61) compared to the control target (*M* = 68.80, *SD* = 23.92), *F*(1, 224) = 14.12, *p* < .001, *η 2* =

*p*

0.06 (95% CI, 0.01 to 0.13).

# Behavioral Engagement

We finally explored whether participants’ likelihood of behaviorally engaging with the target varied between condition or target over time. There was a significant three-way interaction

between time, target, and condition, *F*(1, 224) = 5.69, *p* = .02, *η 2*

*p*

= 0.03 (95% CI, 0.001 to

0.077). There was a significant time by condition effect for Target 2, *F*(1, 96) = 21.47, *p* < .001,

*2* = 0.18 (95% CI, 0.06 to 0.31), such that participants reported higher intention to engage with

*η*

*p*

the target at Time 2 (*M* = 5.45, *SD* = 1.30) compared to Time 1 (*M* = 5.09, *SD* = 1.17) in the

control condition, *F*(1, 51) = 4.09, *p* = .049, *η 2*

*p*

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= 0.07 (95% CI, 0.00 to 0.23). However,

participants reported lower intentions to engage with the target at Time 2 (*M* = 4.44, *SD* = 1.36) compared to Time 1 (*M* = 5.37, *SD* = 1.24) in the transgender condition, *F*(1, 45) = 18.28, *p* <

.001, *η 2*

*p*

= 0.29 (95% CI, 0.09 to 0.47). There was no significant time by condition effect for

Target 1, *F*(1, 128) = 2.65, *p* = .11. There was a main effect of condition such that participants reported lower intentions to engage with the transgender target (*M* = 4.91, *SD* = 1.46) compared

to the control target (*M* = 5.53, *SD* = 1.49), *F*(1, 224) = 14.12, *p* < .001, *η 2*

*p*

= 0.06 (95% CI, 0.01

to 0.13).

# Summary

Participants evaluated the target as warmer at Time 2 than Time 1 regardless of condition; however, the magnitude of the difference was smaller in the transgender condition. Across other variables, participants showed preferences for the control target at Time 2 compared to Time 1 while exhibiting no differences across time for the transgender target. For example, participants perceived control targets as more feminine and reported more favorable attitudes toward them at Time 2 than Time 1; however, there were no differences in perceptions of or attitudes toward the transgender target between Time 1 and 2. Similarly, participants evaluated the transgender target as less feminine at Time 2 compared to Time 1 while not

differing in evaluations of the control target over time. For other variables, the direction of the effect changed across time, depending on condition. Participants evaluated the control target as more attractive and less masculine at Time 2 than Time 1 but evaluated the transgender target as less attractive and more masculine at Time 2 than Time 1. Similarly, participants reported a higher likelihood of behavioral engagement at Time 2 compared to Time 1 in the control condition but showed the opposite pattern of results in the transgender condition, with fewer intentions to engage with the transgender target at Time 2 compared to Time 1. Competence did not differ between condition.

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These results indicate that for some variables, learning an individual is transgender resulted in more negative outcomes (i.e., attractiveness, masculinity, behavioral intentions) while for others, the transgender label prevented the target from receiving a “boost” given to the control target (i.e., warmth, perception, attitudes).

# General Discussion: Meaningful Differences

Because several *p*-values throughout this line of work near .05 and our mean observed power was low2, we conducted a *p*-curve analysis of all statistical tests of the perceptual discrepancies effect to determine whether the present studies exhibit evidential value (Simonsohn, Simmons, & Nelson, 2015). Using the full *p*-curve, the data show evidential value, *Z* = -1.74, *p* = .04, and do not indicate inadequateness of evidential value, *Z* = 0.24, *p* = .60. The same conclusion is drawn when utilizing the half *p*-curve (evidential value: *Z* = -2.57, *p* = .005; inadequateness: *Z* = 2.60, *p* = .99).

1. Recent critiques of popular power analytic techniques suggest we may have been underpowered to identify some two-way and three-way interactions (e.g., [https://approachingblog.wordpress.com/2018/01/24/powering-your-](https://approachingblog.wordpress.com/2018/01/24/powering-your-interaction-2/) [interaction-2/](https://approachingblog.wordpress.com/2018/01/24/powering-your-interaction-2/)).

Additionally, we meta-analyzed our perceptual discrepancies main effects using fixed effects in which the mean effect size was weighted by sample size (Goh, Hall, & Rosenthal, 2016). We first converted our effect sizes into Pearson’s correlation for ease of analyses. All correlations were then Fisher’s z transformed for analyses. Overall, the weighted effect was significant, *Mr*= .07, *Z*= 5.80, *p* < .001, suggesting that across studies perceptual discrepancies

were found between cisgender and transgender identified targets. While the overall effect sizes

of these perceptual difference effects are small, small effects can have meaningful real-world consequences (e.g., Greenwald, Banaji, & Nosek, 2015).

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References

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