

“You Can Always Tell”: Determining the Impact of “Transinvestigator” Visual Misinformation on Attitudes Towards Transgender People

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This study investigates the effects of visual misinformation on attitudes toward transgender inclusion. By examining how exposure to EGI (Elite Gender Inversion) conspiracy theory posts influences individuals' perceptions of transgender people and related policy opinions, the study highlights the interaction of race and gender in shaping attitudes. Utilizing a factorial design experiment, the research explores how both visual and text-based misinformation affect individuals' certainty in determining a celebrity's transgender status. The findings reveal that misinformation, whether visual or text-based, leads to increased uncertainty in determining a celebrity's gender identity, with visual misinformation having a slightly more pronounced effect on participants' certainty compared to text-based misinformation. Importantly, the race of the celebrity was found to play a significant role in moderating these effects, with participants displaying varying levels of confidence depending on the racial identity of the celebrity. This highlights how misinformation can exacerbate racialized perceptions of gender. Given the increasing visibility of transgender individuals and the growing impact of misinformation on digital platforms, this study underscores the importance of exploring how racial and gender biases intersect and shape social perceptions, contributing to transphobic assumptions and attitudes.

KEYWORDS misinformation; visual culture; social media; quantitative methods; cisgender aesthetics

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Within the study of misinformation in communication studies, scholars have focused on text-based claims circulating on social media and in news outlets. Scholars have paid less attention to visual-based misinformation, especially as it relates to issues

around transgender representation and inclusion. The significance of understanding the spread of visual misinformation is particularly relevant when considering the increased visibility of transgender inclusion in political discourse, as well as the increase in misinformation about transgender people more generally online. One conspiracy theory that relies on visual and text-based misinformation that users circulate online is the concept of “elite gender inversion” (EGI). Led by self-described “transvestigators,” these social media accounts produce content that argues many or all celebrity figures are transgender, hiding their “true” gender identity from the general public. The goal of transvestigations, then, is to “reveal” a celebrity’s sex assigned at birth through pseudo-scientific visual cues around bone structure, gait, posture, and other physical characteristics. Through YouTube videos, infographics (e.g., Figure 1), and manipulated images, transvestigators find a picture of a cisgender celebrity from an event or red carpet and highlight the visual elements of their appearance that indexes a person’s “real” sex.

Transvestigators do not have a particular orientation towards specific celebrities, though the celebrities chosen are often cisgender celebrities rather than known transgender celebrities. While not a direct attack on transgender individuals, EGI conspiracy theories circulating online function as a form of anti-LGBTQ+ identity propaganda (Reddi, Kuo, and Kreiss 2023) by normalizing debunked eugenicist understandings of science that one’s sex assigned at birth is grounded in physical characteristics; one just needs to know what to look for to find them. EGI campaigns are a form of insidious misinformation that reaffirms the internal logic of perceiving gender presentation and the false idea that transgender people are deceptively hiding some internal form of gender (Billard, 2019). The mode of misinformation that seeks to reaffirm normative understandings of gender presentation is often overlooked in studies focusing on more straightforward, “fact”-based and textual forms of misinformation. Scholars focus on connecting lineages of misinformation to earlier forms of written propaganda (Bennett and Livingston 2018; Waisbord 2018), its spread (Lu 2020; Morosoli et al. 2025), and its effects (Freelon et al. 2022; Hameleers 2023) as a means of understanding the impact of misinformation in eroding public trust and normalizing social inequalities (Kuo and Marwick 2021). However, misinformation online exists in different forms and media types, such as deepfakes (Rajagopal, Chandrashekar, and Ilango 2023) and memes (Molina 2025; Shifman 2013), each having different effects on an individual’s perception of false information (Weikmann and Lecheler 2023).

Visual misinformation is a prevalent element of digital landscapes and online engagement, with users on platforms like Twitter and Facebook sharing visual content more frequently than text-based media (Tucker et al. 2018). While studies often focus on large-scale political issues, such as electoral politics and the perception of political candidates (Geddes 2021; Yang, Davis, and Hindman 2023), there is a significant gap in literature regarding how visual misinformation influences social perception, identity, and trust, especially in relation to social and cultural norms.

Placing the conspiracy of elite gender inversion in conversation with the visual misinformation literature, the present study considers the effect of transvestigators’ use of visual misinformation on attitudes towards transgender people within the United States. Utilizing a 2 x 3 factorial experiment, the study examined whether visual misinformation, when paired with text-based misinformation, amplified negative



Figure 1. Example Infographic of Elite Gender Inversion Post

attitudes towards transgender individuals and policies affecting trans individuals, as well as the certainty of knowing a person's sex assigned at birth from visual cues. Results show participants exposed to visual misinformation were less confident in their ability to discern a person's gender or sex assigned at birth, which suggests that misinformation impacts the certainty of visual cues used to interpret gender. Rather than directly altering attitudes towards marginalized populations, the continued circulation of visual misinformation contributes to the reproduction of stereotypes and reinforces existing perceptions of gender as a visible and easily identifiable characteristic. This effect, particularly when combined with racial differences, which falls in line with other studies examining the relationship between race and transphobia (Lombardi 2009; Weissinger, Mack, and Watson 2017). These findings highlight how misinformation perpetuates a broader uncertainty about gender and sex, complicating the ways in which individuals make assumptions about transgender people and their political inclusion.

BACKGROUND

Visual misinformation remains relatively under-examined in studies of misinformation as it poses several issues around how to categorize images and their impact on an individual's perception (Swire-Thompson and Lazer 2022; Weikmann and Lecheler 2023). Scholars have started to develop a taxonomy of visual misinformation, including out-of-context text with images (Qian, Shen, and Zhang 2022), "deep fake" or doctored images (Ha, Andreu Perez, and Ray 2021), and even memes or satirical content (Peng, Romero, and Horvát 2022; Tuters and Hagen 2020). Scholars have found that social media users engage with visual misinformation more frequently than textual (Tucker et al. 2018), and often find images more credible or truthful (Steinfeld, 2023).

The current media ecosystem affords different digital actors a larger influence

on mainstream media, allowing extreme claims to reframe narratives, reorient political conversations, and propagate false information that dilutes social trust in institutions (Marwick and Lewis 2017). The primary focus within misinformation and disinformation research has been on “mainstream” issues such as health (vaccine misinformation) and electoral politics (perception of electoral candidates) rather than the influence of less objective claims that impact attitudes around marginalized populations. The efficacy of the COVID-19 vaccine (Lu 2020), election fraud (Starbird, DiResta, and DeButts 2023), and climate change (Freiling, Stubenvoll, and Matthes 2023), have a scientific or widely accepted factual grounding that allows scholars to trace the movement of accepted false information and understand how it affects the perception of (Morosoli et al. 2025; Waisbord 2018).

However, trust and credibility are not limited to social institutions but also have psychological contours that reorient how individuals relate to one another (Ecker et al. 2022; 2022; Jaiswal, LoSchiavo, and Perlman 2020). Examining how disinformation functions to amplify preconceived notions of marginalized populations becomes particularly salient when considering the social discourse on transgender topics and rights in the current political ecosystem. As a critical disinformation studies perspective makes clear, misinformation is not actually an emergent form of propaganda but rather a method for extending pre-existing ideologies on inequality that reassert normative power dynamics through the politicization of fact and identity, creating ambiguity around a concept of “truth” which gain traction within the attention-grabbing campaigns of news outlets (Kuo and Marwick 2021).

Where examinations into more objective facts demonstrate the heightened presence of misinformation, the results often depoliticize how misinformation operates to produce “facts” that harm marginalized populations (Mejia, Beckermann, and Sullivan 2018). Critical disinformation studies demonstrate how misinformation functions through structural hierarchies on media platforms (Jardina 2019), amplifies embedded racial inequalities (Freelon et al. 2022), or reasserts harmful stereotypes pushed by politicians (Flores-Yeffal, Vidales, and Martinez 2019). And these modes of reifying harmful stereotypes become paramount for individuals subject to interlocking systems of marginalization (Jaiswal, LoSchiavo, and Perlman 2020). By examining disinformation through a lens of power, scholars better understand how social dynamics that extend beyond digital media can be reaffirmed by manipulating facts online and spreading them to other users (Monsees 2023).

Misinformation to undermine credibility and produce distrust of other people becomes particularly salient for transgender populations who are already susceptible to violence and harassment online (Kidd and Witten 2007; Marwick 2021; 2023; Nock-Lundberg et al. 2020). Scholars approach the relationship between fake news and transgender rights by examining the strategies that anti-trans activists, media systems, and social media utilize to expand the current gender panic occurring within the United States and the United Kingdom (Bassi and LaFleur 2022; Billard 2023, 2024). While particular to their national context, far-right extremists in the United States and so-called “trans exclusionary radical feminists” (TERFs) have parallel strategies for selecting particular messages that reassert normative tropes of gender (Hines, 2020). Scholars productively point out that misinformation around transgender people reaffirms hegemonic understandings of gender and sex binaries by amplifying anxiet-

ies around trans youth (Lepore, Alstott, and McNamara 2022), the “erasure” of women (Thurlow 2024), or production of anti-gender ideology (Pearce, Erikainen, and Vincent 2020a; 2020b). Moreover, misinformation functions to limit access to necessary medical services (Ashley 2020; Billard 2023, 2024), and intensify the social mistrust of transgender people that permeates into political discourse (Libby 2022).

Transgender inclusion is shaped not just by access to medical services, but also by societal acceptance of their chosen gender presentation. A critical political debate that antagonizes trans bodies is the politics of passing and the visual performance of binary genders. Passing has functioned as a form of stigma management for trans people (Kando 1972; Squires and Brouwer 2002). Originally derived from the concept of racial passing in the United States (Hobbs 2014), passing for transgender people operates through one’s ability to “pass” as their gender identity. The issue of passing as a political/social end goal for trans people is that it produces a normative understanding of what it means to be transgender (Skidmore 2011); This erases nonbinary and gender-nonconforming experiences that fall outside the gender binary (Doyle 2022) as well as places one’s ability to blend in as a measure of safety. In short, passing affirms a “cisgender aesthetic” (Billard 2019; Silva, Souza, and Bezerra 2019) where the safety of a trans person is contingent on their ability to approximate and embody their cis counterparts. It constructs a visual binary of passing/non-passing, giving the dominant power tools to visually determine who is “authentic” to their gender/sex identity and who is deceptively performing it (Billard 2019).

Scholars have documented that this assumed deception around gender becomes particularly relevant to transgender people of color, who are already subject to more potential violence and harm (Bailey 2011; Bettcher 2007). The notion that transgender people are merely “passing” through gender presentation becomes the foundation for transvestigators campaigns against celebrities. Rather than just state that a celebrity is transgender, transvestigators calcify stereotypes around gender deception by relying on pseudo-scientific justifications for the difference between male and female skeletal structures and that these cues from skeletal structures are visible to those who know how to look for them. Phrenology has a well-documented history within eugenics and relies on false understandings that biological differences exist between individuals that are immutable and fundamental to particular demographics (Chun 2009; Lopez 2020). These transphobic and racist understandings of biological essentialism become reappropriated online, connecting EGI campaigns to previously existing power structures around determinism.

These different areas of disinformation circulating online produce a false understanding of transgender identity, which constitutes what Reddi, Kuo, and Kreiss (2023) called “identity propaganda,” or narratives about marginalized populations that circulate in news outlets and on social media that function to exploit previously existing prejudices that reassert a hegemonic structure around identity. These static narratives around identity produce polarization on social media platforms (Kreiss and McGregor 2024) while repurposing sedimented social inequalities into digital spaces (Uyheng, Bellutta, and Carley 2022). By amplifying social differences through false narratives and claims, anti-trans campaigners continue to other transgender people within the political landscape. Gender expression does not exist in isolation but is one that intersects with other forms of identity like race, sexuality, and disability. As trans-

gender scholars of color have highlighted, social inequalities around gender are amplified for non-white bodies (Kando 1972; Keegan 2022; Zhang 2023). This double bind of racial and gendered identity propaganda produces particular experiences (Brown et al. 2018). Thus, EGI posts continue to propagate gender essentialist notions around the body which extend the normative logics that transgender scholars have identified in systems throughout time.

Elite gender inversion (EGI) posts are not only texted-based arguments but rather function as a form of visual misinformation as well that affirms the mechanisms of cisgender aesthetics (Billard 2019) through physiognomy to produce visual claims about whether someone is transgender. Scholars within transgender studies have examined how certain forms of visual presentation that adhere to normative understandings of gender presentation follow cisgender standards around beauty (Zhang et al. 2023). It is not only that one must present as their gender, but they must perform that gender at a heightened space of visibility and care. This reinforces transphobic stereotypes that certain forms of gender presentation are deemed acceptable and others as well as has an impact on the expectations and attitudes that cisgender individuals already hold towards transgender people (Libby 2022; Pearce, Erikainen, and Vincent 2020a; West and Zimmerman 1987).

While EGI misinformation targets celebrities, the claim that one could identify that someone is trans based on skeletal structure and other physical indicators has consequences for trans people generally. The focus on normatively recognized figures of beauty in popular culture potentially allows transvestigators to create more ambiguity on whether a person can disguise their transgender status through an appeal to beauty standards. It also continues to affirm the notion that transgender people are hiding something or are in disguise. Transgender people already face increased online harassment for not adhering to normative power structures (Kuo and Marwick 2021), and the notion that anyone has the capacity to surveil and identify people visually only amplifies the potential harm. Regardless of the intention of why these posts are produced, transvestigations function within a greater ecosystem of misinformation, perpetuating false understandings of science and identity.

The significance of visual images in EGI misinformation campaigns offers insight into whether visual-based misinformation affects or amplifies text-based misinformation, which is the typical focus within misinformation studies. Visual misinformation around gender presentation places transgender people in a particularly dangerous position, for it reifies essentialist understandings that there are correct ways of performing gender. It provides those in power with the misguided idea that they can determine whether one “passes” through assessment. Not only does this create distrust between individuals, but passing affirms a cisgender aesthetic (Billard 2019; Johnson 2013; Silva, Souza, and Bezerra 2019) where the safety of a trans person is contingent on their ability to approximate and embody their cis counterparts.

Given the pervasiveness of visual misinformation in digital spaces and its role in reinforcing essentialist gender norms, it is crucial to empirically examine its effects. Specifically, we aim to explore how visual misinformation interacts with text-based misinformation, influences perceptions of gender presentation, and affects transgender individuals in online environments. To address these questions, we propose the following hypotheses:

- H1:** Exposure to EGI misinformation (text-based or text paired with visual) will lead to more negative attitudes toward transgender individuals.
- H2:** Participants exposed to EGI misinformation with visual elements will experience larger shifts in their confidence determining a person's gender compared to those exposed to text-only misinformation or no misinformation.
- H3:** EGI misinformation will increase the likelihood that participants believe the celebrity shown is transgender, with this effect being stronger for misinformation with visual elements.
- H4:** The effect of EGI misinformation on attitudes and certainty will vary based on the race of the celebrity, with EGI posts about a person of color leading to different responses compared to a white celebrity.

METHOD

To investigate these hypotheses about the effects of visual misinformation, we utilize elite gender inversion posts created by “transvestigators” as the foundation for a factorial experiment manipulating the presence of misinformation exposure. We conducted a three (no misinformation, text-only misinformation, text and visual misinformation) by two (celebrities Wendy Williams and Heather Gay) experiment of social media users who reside in the United States. Transvestigator posts circulate across social media platforms, ranging from YouTube to X (formerly Twitter). Individuals may come across an EGI post while scrolling through their feed without considering whether it contains misinformation. To explore this, we created six social media posts and randomly assigned them to participants. This setup allows for comparisons between different experiment groups and provides insight into how posts with misinformation influence attitudes toward transgender inclusion and policy.

Stimuli: EGI Post

Transvestigations to determine a celebrity's “real gender” have gained enough traction online that there are Facebook groups with more than 17,000 members who share visual and textual misinformation on transgender people (Lenton 2024). Individuals will find an image of a celebrity either from a television show or recent photoshoot and then overlay information that “proves” that the individual is hiding their transgender status. The infographics utilize pseudo-scientific concepts like “Q Angle” or other claims rooted in physiognomy, positing physical characteristics are inherently connected to sex characteristics. Creators will regularly include multiple images of the celebrity to justify their claim, creating a collage-like infographic (see Figure 2). EGI posts merge visual infographics that rely on false science in conjunction with textual misinformation to argue that all celebrities are transgender, and you can figure it out through visual cues. Appendix A includes the six stimuli randomly assigned to participants in each experimental condition. There were two different ways of grouping the social media posts. All posts included an image of a cisgender female celebrity from a red-carpet event, with accompanying text that described the image. Images of the celebrity were selected to minimize differences between the two figures.

The two celebrities, Heather Gay and Wendy Williams, were carefully selected



Figure 2. Example Twitter #EGI Post

for several reasons. First, both celebrities have documented histories of public speculation that they may be transgender women. Heather Gay, a cast member on the reality television program *The Real Housewives of Salt Lake City*, was initially thought to be a transgender woman after her first appearances on the show (DeCecco 2021). Wendy Williams, a popular daytime talk show host and public figure, has also been subject to speculation about her gender identity throughout her decades-long career (Marquina 2014). Additionally, both celebrities have some degree of social status, regularly walking red carpets or attending publicized social events. However, the two celebrities differ in race, with Heather Gay being a white woman and Wendy Williams being a Black woman, allowing the opportunity to make comparisons between the different celebrity-assigned groups.

For each celebrity image, three test conditions were included with variable amounts of accompanying misinformation. Images were modeled to look like Tweets, or posts commonly made to the popular social media platform X. Two groups either received an image of Wendy Williams or Heather Gay with a neutral description of the image. These groups function as the control group with the post including neither text-based nor visual misinformation. Another group of participants were presented the same images, but in this case with a caption utilizing EGI conspiracy rhetoric and speculating about the celebrity's gender identity. Specifically, the caption took the format: "Forensics do not lie; you can always tell someone's gender by looking at their bone structure. Phrenologists have been proving this for years. Regardless of what you

read online, you just need to know what to look for. [Celebrity name] is a MAN #EGI.” This caption was modeled by synthesizing captions included on popular transvestigator posts online, mirroring the language of physiognomy that commonly appears in EGI conspiracy posts. Finally, two groups were presented a social media post that contained the same text-based EGI misinformation as well as skull overlay on top of the celebrity’s image, using visual information to “prove” their textual claim. It was essential to consider the ethical implications of this experiment, particularly whether asking participants to perform a gender assessment reinforces the very issue we are studying. In the post-test instructions, we clarified that the posts containing EGI misinformation were false, ensuring that participants did not leave the study believing the social media posts were factual.

Participants

Participants ($N = 667$) were recruited utilizing Prolific, an online participant recruitment platform that functions as an alternative to Amazon’s Mechanical Turk. Research has shown that Prolific produces significantly higher data quality across a range of factors than common respondent recruitment platforms and survey sampling firms like MTurk, Dynata, and Qualtrics (Peer et al. 2017; 2021). The study was conducted in two waves and participants were offered financial compensation for completing each part. Participants who did not complete the second wave of the study only received compensation for completing the first wave. With the understanding that some participants would drop out between waves, the first wave of the study was sent to 1,004 individuals in the Prolific system. Participants who failed one of the attention check questions or completed the survey in less than 30 seconds were removed from the dataset, leaving a Wave One sample of $N = 984$. One month after Wave One, each of the included participants was sent an invitation to Wave Two and given roughly a week to complete the second wave. Attention checks were again placed throughout the survey, and only completed surveys were accepted and included in the final dataset. This final dataset included $N = 667$ participants.

The participants in this experiment were randomly assigned to conditions, ensuring a balanced distribution of key demographic characteristics (e.g., age, gender, religion, and race/ethnicity) across all experimental groups (see Table 1). Ages of study participants ranged from 18 to 80 ($M = 41.62$, $SD = 13.37$). Over half of participants (56.37%) identified as cisgender women, 40.03% as cisgender men, 2.55% as nonbinary, and 0.59% and 0.45% as transgender men and transgender women, respectively. The majority of participants identified as White (70.45%), while the remainder identified as Asian American/Pacific Islander (11.51%), Black/African American (12.27%), Latin or Hispanic (5.75%), or multiracial (1.71%). The vast majority of participants reported aligning more with the Democratic Party (69.67%), while a minority reported aligning more with the Republican Party (30.33%).

Measures

Participants were asked to provide information about their age, gender identity, religiosity, and political orientation. All measures beyond demographic information took the form of 7-point Likert-type scales, except where otherwise stated, although response labels differed depending on the construct. For all scales, greater scores in-

Table 1. Summary of Demographic Characteristics (N = 667)

Characteristic	M (SD) / n (%)
Age	41.62 (13.37)
Gender	
Women	535 (56.82%)
Cisgender women	376 (56.37%)
Transgender women	3 (0.45%)
Men	271 (40.63%)
Cisgender men	267 (40.03%)
Transgender men	4 (0.59%)
Nonbinary	17 (2.55%)
Race/Ethnicity	
White or European	465 (70.45%)
Black or African	81 (12.27%)
Asian or Pacific Islander	76 (11.51%)
Latin or Hispanic	38 (5.75%)
Multiracial	7 (1.71%)
Education	15.19 (2.55)
Religion	
Religiously unaffiliated	329 (49.33%)
Christian	276 (41.38%)
Jewish	18 (2.19%)
Muslim	7 (1.05%)
Buddhist	4 (0.60%)
Hindu	4 (0.60%)
Some other religion	7 (1.00%)
Political Party	
Democratic Party	464 (69.67%)
Republican Party	202 (30.33%)

dicate greater magnitudes of the construct. Demographic and control variables were captured only once in either the pre-test or post-test questionnaire, while dependent variables were collected twice, in both questionnaires.

Gender Essentialism

Gender essentialism was measured using a 10-item unidimensional scale developed by Coleman and Hong (2008) as adapted by Wilton et al. (2019). It was included as a measure of individual attitudes toward gender diversity. Sample items include “When men and women differ in some way, it is likely that the difference is due to biological factors” and “Gender is a result of ‘nurture’ more than ‘nature.’” The 10 items of the gender essentialism scale were tested for reliability ($\alpha = 0.81$) and averaged to create a single scale.

Attitude Toward Transgender Men and Women

To measure attitudes toward transgender people, the study includes the Attitudes Toward Transgender Men and Women scale (Billard 2018). Attitudes towards transgender men and transgender women were measured separately, meaning that questions specified a particular gender identity, such as “Transgender men don’t really understand what it means to be a man.” Measurements that were higher on the scale indexed negative attitudes towards transgender men or transgender women, respectively. The 12 items of the Attitudes Toward Transgender Men (ATTM) subscale were tested for reliability ($\alpha = 0.97$) and averaged to create a single scale, while the 12 items of the Attitudes Toward Transgender Women (ATTW) subscale were tested for reliability ($\alpha = 0.97$) and averaged to create a separate scale.

Opinions on Transgender Policy

Adapting Walch et al.’s (2012) ATTI scale, participants were asked about their support for pro-transgender policy and transgender inclusion (e.g., “A local business should have a right not to hire a transgender person”). Response options for each item ranged from strongly disagree (1) to strongly agree (7). Similar to Attitudes Toward Transgender Men and Women, sensitization was a concern because the same measure was employed during each wave. However, the closest measurements were one month apart, making it unlikely that participants remembered the specifics of the questionnaire items. The 14 items of the opinions on transgender policy scale were tested for reliability ($\alpha = 0.94$) and averaged to create a single scale.

Assessment of Transgender Status

Participants were asked whether they believed the celebrity depicted in the stimulus was transgender (Yes) or not (No), as well as to rate their confidence in that assessment on a scale from 1 (not at all confident) to 100 (absolutely certain). Participants were also asked to rate their confidence in assessing a stranger’s sex assigned at birth just by looking at them, also on a scale from 1-100.

Pervasive Ambiguity About Gender

The Pervasive Ambiguity About Gender (PAAG) scale measures individuals’ experiences of cognitive and affective disorientation regarding the social meanings of gender, capturing how challenges to previously stable categorizations of biologically determined and socially sanctioned gender contribute to confusion and discomfort (Billard, Jenkins, and Brewer 2025). This scale is designed to assess both the emotional and cognitive dimensions of ambiguity, including feelings of unease, frustration, and overwhelm when confronted with evolving gender norms and identities. Sample scale items include, “I feel like there are so many different gender identities that it is hard to keep track of them all,” “I miss the days when men were men and women were women,” and “Male, female, nonbinary, gender fluid—I can’t keep up with it all.” By quantifying these responses, the PAAG scale offers a nuanced approach to measuring how individuals process and react to societal shifts in gender understanding. The 9 items of the Pervasive Ambiguity About Gender scale were tested for reliability ($\alpha = 0.98$) and averaged to create a single scale.

Controls: Celebrity Familiarity, Transgender Network

One's acceptance of false information, especially around identity, often coincides with personal connections to the target of misinformation campaigns (Reddi, Kuo, and Kreiss 2023). Thus, a number of controls were included to test whether familiarity with the subject of the EGI post or relationships with transgender individuals influences attitudinal changes. Participants were asked whether they knew the celebrity before taking the survey and whether they looked up the celebrity while taking the survey. Finally, participants were asked a number of questions about their relationships to transgender people in their immediate network, including questions like, "How many people in your family, close friends, and place of work identify as transgender?" and "How familiar would you say you are with gender ideology or transgender politics?"

Procedures

In Wave One, participants completed a pre-test questionnaire that asked them basic demographic questions and baseline measures of their attitudes towards transgender people before proceeding to the experiment group. The questionnaire took no longer than five minutes to complete and participants were informed that they would receive an invitation to a second follow-up survey at a later date. Eligible participants who completed Wave One ($N = 984$) were sent the experimental study via email one month after wave one. Participants were again asked to complete the survey in one sitting. In Wave Two, participants were given one of six experimental conditions with a required thirty second timer, ensuring the participants had able time to view the post without being able to quickly move to the questions. After viewing the stimuli, participants were asked whether the celebrity in the image was transgender, their level of confidence in assessing a stranger's sex assigned at birth based solely on visual cues, and the attitudinal questions included in the pre-test questionnaire. The wave one and wave two responses were matching using respondents' unique Prolific ID numbers. Similar attention checks and time checks were employed in Wave Two to ensure compliance with the experimental procedures.

Because the figures presented in the experimental stimuli were public figures, and participants' prior experiences with or knowledge of the celebrity could affect the results of the study, participants were asked in Wave Two about their familiarity with the celebrity and whether they looked up the celebrity online during the study. After completing Wave Two, participants were informed that the study they had participated in was an experiment about misinformation and attitudes towards transgender people, and that the content presented to them in the experimental stimuli was fake.

RESULTS

To assess the effectiveness of randomization, demographic variables were compared across experimental groups using chi-squared tests for categorical variables and ANOVA for continuous variables. Chi-squared tests indicated no significant differences in gender distribution ($\chi^2(4) = 19.05, p = 0.52$), the recategorized binary race variable (white vs. non-white; $\chi^2(5) = 0.15, p = 1.00$), or political party affiliation ($\chi^2(10) = 10.92, p = 0.36$) across experimental groups. For continuous variables, ANOVA results revealed no significant differences in age ($F(5, 661) = 0.38, p = 0.86$), income ($F(5, 661) = 0.15,$

$p = 0.98$), or online media use ($F(5, 661) = 1.23, p = 0.29$). These findings indicate that the randomization procedure was effective, ensuring balanced distribution of demographic characteristics across all experimental conditions. The absence of significant differences supports the validity of subsequent analyses by minimizing the risk of demographic confounds influencing experimental outcomes.

H1 predicted that exposure to different experiment conditions would lead to significant differences in attitudes as measured by Attitude Toward Transgender Men and Women scales and Opinions on Transgender Policy scale. To test this hypothesis, we conducted a one-way ANOVA for each dependent variable, with the experiment group (A = no misinformation, B = text only EGI misinformation, C = text and visual EGI misinformation) as the independent variable (see Table 2). For attitudes towards transgender men, the ANOVA test revealed a significant effect of the experiment group, $p = 0.01$, indicating that there were significant differences in the mean scores across the groups. Follow-up Tukey HSD post-hoc tests showed that Group B had significantly higher mean values ($M = 0.16$) than Group A ($M = -0.03$), $p = 0.01$, but no significant difference was found between or between Group B and Group C ($M = 0.02$), $p = 0.10$.

Similarly, for attitudes towards transgender women, the ANOVA indicated a significant effect of the experiment group on the mean scores ($p = 0.04$). The Tukey HSD test revealed that Group B ($M = 0.15$) again had significantly higher scores (more negative attitudes) than Group A ($M = -0.03$), $p = 0.04$. However, there were no significant differences between Group C ($M = 0.01$) and Group A, $p = 0.86$, or between Group B and Group C, $p = 0.14$. These findings support the hypothesis that experiment group exposure influences attitudes, specifically showing a significant difference between Group B and Group A for both dependent variables, while the differences between Group C and the other groups were not significant. A further ANOVA test was conducted to examine differences between experimental groups on the Opinions on Transgender Policy scale. Results indicated no statistically significant differences between groups, suggesting that the experimental manipulation did not influence participants' views on this measure. Therefore, H1 was partially supported.

H2 predicted that participants exposed to EGI misinformation with visual elements would experience larger shifts in their confidence in determining a person's gender compared to those exposed to text-only misinformation or no misinformation. To test this hypothesis, we conducted a one-way ANOVA on the dependent variable Gender Assessment Certainty, with the experiment group (A, B, C) as the independent variable. The ANOVA revealed a significant effect of the experiment group on participants' confidence, $F(2, 664) = 7.11, p < .001, \eta^2 = .02$, indicating that the shift in confidence varied significantly between the experiment groups. Group C (visual misinformation) showed the smallest decline in confidence ($M = -4.01$) compared to Group A ($M = -7.69$) and Group B (text-only misinformation; $M = -7.00$). Post-hoc Tukey tests indicated a significant difference between Group C and Group A, $p < .001$. However, there were no significant differences between Group B and either Group A ($p = .07$) or Group C ($p = .28$). These findings suggest that visual misinformation may have had some influence on participants' confidence, though the lack of a significant difference between the visual and text-only conditions limits our ability to attribute the effect solely to the visual element.

H3 predicted that EGI misinformation would increase the likelihood that par-

Table 2. Means, Standard Deviations, and One-Way Analyses of Variance in Changes in Attitudes Towards Transgender Men, Women, and Policy Opinions

Measure	Experiment Condition: A		Experiment Condition: B		Experiment Condition: C		F(2, 663)	η^2	Tukey Significant Comparisons
	M	SD	M	SD	M	SD			
Change in Attitude Toward Transgender Men	−0.03	0.62	0.16	0.75	0.02	0.65	4.57***	.01	B > A ($p = .01$)
Change in Attitude Toward Transgender Women	−0.03	0.69	0.15	0.85	0.01	0.87	3.21***	.01	B > A ($p = .04$)
Changing Opinion on Transgender Policy	−0.03	0.49	−0.01	0.51	−0.02	0.47	.10	< .001	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

ticipants believe the celebrity shown is transgender, with the effect being stronger for misinformation with visual elements. To test this hypothesis, we conducted a logistic regression model to predict whether participants believed the celebrity was transgender (a binary variable) based on a set of predictors, including the presence of misinformation, demographic variables, and controls (see Table 3). The results indicated that, although misinformation did not have a significant effect on the likelihood of believing the celebrity was transgender ($p = 0.17$ for B vs. A and $p = 0.41$ for C vs. A), several other variables were significantly associated with the outcome. Specifically, the variable assessing Pervasive Ambiguity About Gender had a positive effect ($\beta = 0.13$, $p < 0.05$), suggesting that participants with a greater unease about the societal changes around gender are more likely to believe the celebrity was transgender. The effect of political party was also significant ($\beta = -0.88$, $p < 0.001$), with Democrats less likely to believe the celebrity was transgender compared to the baseline group, Republicans.

Furthermore, confidence in determining a person's gender by sight was a strong predictor ($\beta = -0.50$, $p < 0.001$), indicating that participants who felt more confident in identifying transgender individuals were more likely to believe the celebrity was transgender. Age ($\beta = 0.03$, $p < 0.001$) was also significant, with older participants more

Table 3. Summary of Binomial Regression Results for Perception of Celebrity Gender Status ($N = 667$)

Variable	β	b (SE)
Intercept	-3.09***	-3.09 (0.72)
Experiment Group: Wendy Williams	-1.50***	-1.51 (0.46)
Text-only Misinformation	-0.19	-0.19 (0.31)
Text and Visual Misinformation	0.07	0.07 (0.32)
Pervasive Ambiguity	0.13*	0.13 (0.07)
Lookup Celebrity	0.43	0.43 (0.62)
Familiar with Celebrity	-2.26***	-2.27 (0.34)
Gender Assessment Certainty	-0.50***	-0.50 (0.08)
Gender Essentialism	0.19	0.19 (0.16)
Age	0.03***	0.03 (0.01)
Political Party (Democrat = 1)	-0.88***	-0.88 (0.26)
Know Trans Person (Yes = 1)	0.06	0.06 (0.06)
Follow Trans Politics (Yes = 1)	-0.01	-0.01 (0.15)
Gender ID: Woman	-0.09	-0.09 (0.22)
Gender ID: Nonbinary	-0.85	-0.85 (0.85)
Gender ID: Transgender Man	-14.82	-14.82 (694.99)
Gender ID: Transgender Woman	-13.08	-13.08 (741.75)
Interaction: Text-only $\times$ Race Experiment Group	1.23*	1.24 (0.57)
Interaction: Text+Visual $\times$ Race Experiment Group	1.18*	1.18 (0.57)
McFadden's R^2		0.33

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. The dependent variable is the response to: "Is the celebrity transgender?" (1 = Yes, 0 = No).

likely to believe a celebrity is transgender. These results suggest that while the type of misinformation (visual vs. text-based) did not significantly affect the belief that the celebrity was transgender, factors such as pervasive ambiguity, political affiliation, certainty in identifying gender, age, and knowing someone who is transgender played a much larger role in shaping participants' perceptions.

H4 predicted that the effect of EGI misinformation on participants' perceptions of whether a celebrity was transgender would vary based on the race of the celebrity, with misinformation about a person of color leading to different responses compared to a white celebrity. The results of the logistic regression model support this hypothesis, revealing a significant interaction between the experiment condition of race and the experiment condition of misinformation. Specifically, the interaction between the two was significant for both text-based misinformation ($p = 0.03$) and text and visual misinformation ($p = 0.04$), indicating that the likelihood of perceiving the celebrity as transgender varied depending on both the celebrity's race and the type of misinformation.

For the Wendy Williams condition (experiment condition 2), both misinformation types led to a significant increase in the likelihood of perceiving the celebrity as transgender when compared to no misinformation. Participants exposed to text-only misinformation ($M = 0.16$) were significantly more likely to believe the celebrity was transgender than those in the no misinformation control group ($M = -0.03$), $p = .01$. Similarly, those exposed to text and visual misinformation ($M = 0.02$) also differed significantly from the control group, $p = .04$. The overall ANOVA confirmed a significant effect of misinformation condition on belief, $F(2, 664) = 4.57$, $p = .01$, $\eta^2 = .01$.

In contrast, for the Heather Gay condition (experiment condition 1), the effects were less pronounced. Participants exposed to text-only misinformation ($M = 0.11$) did not differ significantly from those in the control condition ($M = -0.05$, $p = .83$). Exposure to text and visual misinformation ($M = 0.02$) also did not significantly differ from control condition, $p = .56$. Though the group mean increased, the direction of the effect was less clear. The overall ANOVA for this condition was not significant, $F(2, 664) = 0.64$, $p = .43$, suggesting that misinformation had a weaker impact in this context. These results indicate that, for the celebrity of color, EGI misinformation had a stronger influence on perceptions of transgender status.

Figure 3 illustrates how the type of misinformation interacts with the race of the celebrity to influence participants' likelihood of perceiving the celebrity as transgender. For Heather Gay, the probability decreases with text misinformation but shows a slight increase when visual and text misinformation are present. In contrast, for the Wendy Williams condition, the probability steadily increases as misinformation type changes. This suggests that the change in misinformation has a stronger effect on perceptions of transgender identity for a person of color compared to a white celebrity, with the type of misinformation playing a significant role in shaping these perceptions.

Further post-hoc analysis, specifically Tukey's multiple comparisons of means, revealed several noteworthy findings regarding the interaction between race of the celebrity and misinformation type. For the Wendy Williams condition, the presence of text-based and visual misinformation resulted in a significant increase in the likelihood of perceiving the celebrity as transgender when compared to no misinformation.

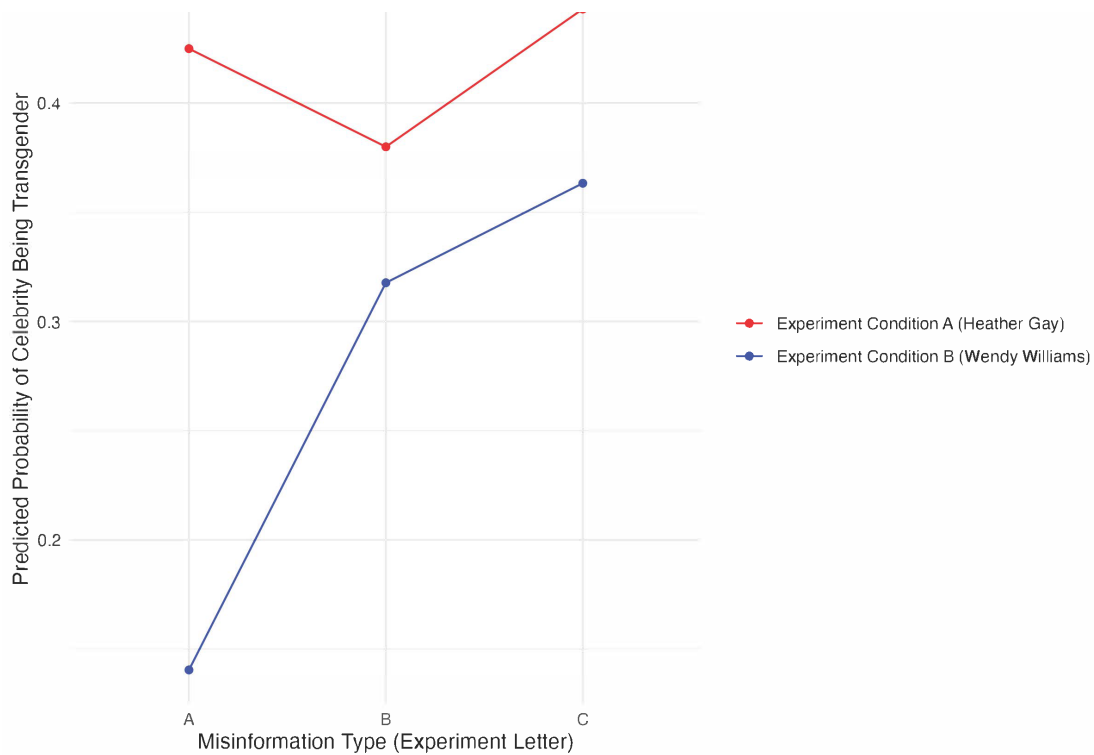


Figure 3. Effect of Misinformation Type on Perceptions of Celebrity Transgender Identity

Specifically, the difference between no misinformation and text-only misinformation was significant ($M_{\text{diff}} = 0.19, p = .01$), indicating that text-only misinformation had a stronger effect on perceptions of Wendy Williams than when no misinformation was present. Similarly, the difference between no misinformation and text and visual misinformation approached significance ($M_{\text{diff}} = 0.06, p = .04$), showing that visual and text misinformation also increased the likelihood of perceiving the celebrity as transgender in the Wendy Williams condition. The overall ANOVA for this condition was significant, $F(2, 664) = 4.57, p = .01, \eta^2 = .01$.

In contrast, for the Heather Gay condition, misinformation did not have as pronounced an effect on perceptions. For instance, the comparison between no misinformation and text-only misinformation was not significant ($M_{\text{diff}} = 0.02, p = .76$), suggesting little to no difference in the likelihood of perceiving the celebrity as transgender between these two misinformation types. However, text and visual misinformation showed a small, non-significant difference compared to no misinformation ($M_{\text{diff}} = 0.02, p = .59$), suggesting a potential trend where visual misinformation may have slightly *reduced* the likelihood of perceiving the celebrity as transgender. The overall ANOVA for this condition was not significant, $F(2, 664) = 0.64, p = .43$.

Overall, the post-hoc comparisons revealed that misinformation had a greater impact on perceptions of transgender status when the celebrity was a person of color (Wendy Williams) compared to a white celebrity (Heather Gay), highlighting the intersection between race and misinformation. This suggests that the race of the celebrity moderated the effect of misinformation, with misinformation having a stronger influ-

ence on the likelihood of perceiving the celebrity as transgender in the person of color condition.

DISCUSSION

Consistent with Hypothesis 1, participants exposed to Elite Gender Inversion (EGI) misinformation exhibited a significant shift in their attitudes toward transgender individuals and policies related to transgender inclusion. The results of the ANOVA revealed substantial differences in the change scores in attitudes towards both transgender men and transgender women, with notable shifts in attitudes toward transgender men being more pronounced than those toward transgender women. This discrepancy may be particularly relevant when considering the literature on how visual and text-based misinformation can alter perceptions of gender (Tucker et al., 2018). The heightened sensitivity toward transgender men may reflect a deeper confusion or lack of familiarity in distinguishing between transgender men and women, a point further supported by the fact that all participants were shown images of cisgender women, which complicates the interpretation of results. In line with previous studies, groups exposed to both visual and text-based misinformation exhibited the greatest shift in attitudes, confirming the powerful role of visual misinformation in altering perceptions (Steinfeld 2023).

While there were no significant differences between the impacts of visual and text-based misinformation, both types still produced measurable shifts compared to the control group, which received no misinformation. This suggests that the medium, whether visual or textual, may not significantly alter the nature of the misinformation's impact but that its presence alone is sufficient to influence participants' perceptions. These findings are consistent with the broader body of misinformation research, which highlights that both visual and textual misinformation can contribute to cognitive shifts, particularly in the context of gender identity (Ecker et al. 2022). Although the lack of significant difference between the two misinformation types suggests that both influence certainty similarly, the overall effect of misinformation, regardless of form, underscores the broader societal issue of misinformation surrounding gender identities.

Hypothesis 2 predicted that participants exposed to EGI misinformation with visual elements would experience larger shifts in their confidence regarding gender identification compared to those exposed to text-only misinformation or no misinformation. The results supported this hypothesis, revealing that participants exposed to visual misinformation (Group C) exhibited a significant shift in their confidence in determining gender, particularly when compared to the control group (Group A). Interestingly, while text-only misinformation (Group B) showed some influence on confidence, the difference between Group B and the other groups was not significant, suggesting that the visual component of misinformation played a more substantial role in shaping participants' certainty about gender identification. These findings highlight the unique influence of visual misinformation on gender perception, reinforcing previous research that suggests images and visual cues are particularly potent in shaping individuals' beliefs, especially in contexts related to gender identification.

Hypothesis 3 posited that EGI misinformation would increase the likelihood

of participants believing the celebrity shown was transgender, with this effect being stronger when visual elements were present. While the results did not support the hypothesis in terms of a significant increase in the likelihood of perceiving the celebrity as transgender based on misinformation, several other factors played a significant role. Specifically, pervasive ambiguity about gender, a measure of participants' uncertainty about changing gender norms, was positively correlated with the likelihood of believing the celebrity was transgender. Political affiliation also emerged as a key factor, with Democrats less likely to believe the celebrity was transgender compared to Republicans. These findings suggest that, while EGI misinformation itself did not significantly alter perceptions of gender identity, individual differences, such as political views and societal uncertainty about gender, significantly shaped how participants interpreted the misinformation. This underscores the need to consider individual predispositions when examining the effects of misinformation on gender identity perceptions.

Hypothesis 4, which predicted that the effect of EGI misinformation on participants' perceptions of whether a celebrity was transgender would vary based on the race of the celebrity, was supported by the results. Specifically, the interaction between the race of the celebrity and the type of misinformation was significant for both text-based misinformation and text plus visual misinformation. This indicates that the likelihood of perceiving the celebrity as transgender varied depending on both the celebrity's race and the type of misinformation presented. These results align with the literature on identity propaganda (Reddi, Kuo, and Kreiss 2023), which suggests that misinformation often works by amplifying pre-existing stereotypes and biases, particularly around marginalized groups. In this case, the misinformation around transgender identity was shaped by racial stereotypes and contributed to reinforcing harmful narratives about people of color.

The findings from this study provide compelling evidence that Elite Gender Inversion (EGI) misinformation has a disproportionate impact on perceptions of transgender identity, with race playing a significant role in shaping these perceptions. As anticipated, exposure to EGI misinformation led participants to make increased assumptions about a celebrity's gender identity, with significant effects seen when the celebrity was a person of color, specifically Wendy Williams. This suggests that misinformation about gender identity is not only shaped by the content itself (whether visual or textual) but also by the racialized nature of the subject being targeted, aligning with the literature on identity propaganda. As argued by Kuo and Marwick (2021), misinformation often extends and amplifies existing prejudices and power dynamics, particularly in marginalized communities. In this case, misinformation about transgender identities in people of color taps into pre-existing racial stereotypes, reinforcing harmful biases and racialized perceptions of gender.

The interaction between race and misinformation effects found in this study contributes to our understanding of how racialized gender stereotypes shape perceptions, a theme that has been central to critical disinformation studies. Previous research has highlighted that the perceptions of people of color are often distorted through racial stereotypes, with misinformation serving as a tool for reinforcing these stereotypes (Freelon et al., 2022). For example, participants exposed to images of Wendy Williams, a Black celebrity, were more likely to perceive her as transgender when

exposed to misinformation, especially when visual elements were included. This result underscores the power of visual misinformation in re-disciplining public perceptions, which has been noted in other studies exploring the intersection of race, gender, and visual representation (Zhang et al. 2023). The visual elements of misinformation appear to be particularly potent in reinforcing racialized understandings of gender, making individuals more prone to believing that celebrities from marginalized racial backgrounds may be transgender based on their physical appearance.

Interestingly, for the white celebrity condition (Heather Gay), the effect of misinformation was less pronounced, particularly with text-only misinformation. However, visual misinformation still significantly altered participants' perceptions, suggesting that the combination of visual and textual misinformation is particularly effective in shifting gender perceptions, even when race is less salient. However, the lesser impact of text-only misinformation in the Heather Gay condition may suggest that, in the case of white celebrities, visual cues play a more crucial role in influencing perceptions, potentially due to dominant norms around beauty and gender presentation. These findings are consistent with identity propaganda theories, which argue that misinformation works by tapping into deep-seated societal anxieties and biases, particularly about gender and race. As Pearce et al. (2020a) and Lepore et al. (2022) note, misinformation campaigns frequently target marginalized groups to reinforce hegemonic narratives around gender, particularly those based on binary understandings of sex and gender.

The interaction of race and gender within the context of EGI misinformation raises important questions about how this imagery, even if created about cisgendered celebrities, can perpetuate harmful stereotypes, especially when misinformation about transgender identity is amplified. In addressing misinformation that disproportionately affects marginalized populations, it is crucial to consider the dynamics of race and gender. As the digital landscape continues to evolve, especially in the context of social media and viral content, future research should continue to explore how visual misinformation interacts with racial and gender stereotypes to perpetuate harm, particularly for transgender individuals of color. Addressing these challenges requires a broader understanding of how misinformation works to reinforce pre-existing stereotypes and how this can be mitigated through better education, regulation, and awareness surrounding visual misinformation.

While the current study provides significant contributions to the field, there are several limitations that offer opportunities for future research. One key limitation is the methodological approach used to capture the effects of visual misinformation. Future studies could benefit from employing longitudinal designs to examine the long-term effects of exposure to EGI misinformation on attitudes and beliefs over time. Such designs would allow researchers to better understand the cumulative impact of repeated exposure to misinformation and how it shapes perceptions over extended periods, providing a more comprehensive view of its social implications.

Additionally, expanding the study to include lesser-known celebrities or individuals with comparable levels of fame would deepen our understanding of how familiarity with the subject influences perceptions. Given that the celebrity's familiarity can act as a potential moderator in the perception of gender identity and misinformation, exploring less mainstream figures would offer a more nuanced perspective on the

role of fame and recognizability in shaping attitudes. Furthermore, the study focused primarily on images and text-based misinformation, yet EGI misinformation also extends into other formats, such as video content. Given the increasing prominence of multimedia platforms like YouTube and Reddit, incorporating video content in future research would provide a more comprehensive understanding of how different types of content—including multimedia formats—contribute to shifts in attitudes and perceptions regarding gender and transgender identity (Freelon et al. 2022).

Another limitation is the narrow focus of this study on misinformation about celebrities, which may not necessarily generalize to real-world interactions with transgender individuals in everyday settings. Future studies could explore how misinformation about transgender identity influences interpersonal relationships and social dynamics beyond the media sphere. Examining how misinformation intersects with real-world gender performance, stereotypes, and interpersonal interactions would provide important insights into the broader social consequences of misinformation.

As the visibility of transgender individuals continues to rise, so too does the complexity of the disinformation campaigns that target them. This study has made an important contribution to our understanding of the role of visual misinformation in shaping attitudes toward marginalized populations. Moving forward, it is essential to address the confluence of race, gender, and misinformation, particularly as disinformation campaigns evolve across digital platforms. Given the increasing pervasiveness of misinformation and its potential to influence both public attitudes and policy outcomes, continued research is needed to assess the long-term effects of misinformation on societal norms, political discourse, and policy decisions related to transgender rights and gender equity. Misinformation doesn't just mislead. It affirms the belief that you can, and should, be able to "always tell." And that misinformed belief carries real consequences.

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