Emotion

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Is Emotion Perception Altered by Gaze Direction, Gender Appearance, and Gender Identity of the Perceived Face?

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The purpose of the present study was to examine how gaze and emotion processing may change due to differences in gender appearance and gender identity of the perceived face. We manipulated gender appearance (male or female), gender identity (cisgender or transgender), gaze direction (direct or averted), and expressed emotions (anger, fear, or neutral) of face models in an emotion rating task. We replicate several previous findings, including a direct gaze advantage, an emotion effect, and an interaction between gaze direction and expressed emotion. In line with previous findings on the influence of facial morphology for face processing, we found that male faces were more quickly and intensely perceived for displays of anger, while female faces were more quickly and intensely perceived for displays of fear. Of key interest, gender identity influenced face perception for different emotion expressions and gaze directions for ratings and reaction times in a variety of ways. For example, transgender male faces were seen as angrier and less fearful than cisgender male faces, while the opposite effect occurred for female faces. These results suggest that face perception is systematically shaped by morphological differences as well as more abstract social constructs related to gender identity.

Keywords: emotion processing, gaze, face perception, gender identity

Processing facial expressions is one of the most efficient ways to interpret other people's intentions and emotions. Facial expressions of emotions, often in combination with gaze direction, give us key insights into how to proceed with a social interaction. If the person to whom we are talking suddenly looks directly at us with an angry expression, then we are likely to assume that they are angry and that their anger is directed toward us. We may pause to reflect on what we did or said prior to this angry look. If the person with whom we are interacting instead looks away from us and is seemingly fearful, then we may avert our gaze to look in the same direction they are looking to see what they are fearful of. Doing so may help us detect potential threats to ourselves. Thus, identifying facial expressions and gaze direction is incredibly important in our daily lives.

The recognition of expressed emotions has been extensively studied. Several of these studies examine the interactions between gaze direction and expressed emotions (e.g., Adams & Kleck, 2003, 2005; Breil et al., 2022; Pittig et al., 2023), as well as processing differences of facial expressions by masculine versus feminine faces (e.g., Hess et al., 2004). So far, this research partitioned sex and gender into homogenized categories without considering genders outside of the strict cisgender binary categories (i.e., male and female). Here, the present study was designed to identify potential differences in the ways in which participants may respond to the expressed emotions of face models labeled as male and female as well as cisgender versus transgender.

Examining differences between cisgender and transgender identities is of interest for several reasons; first, people infer relatively detailed aspects of a person's identity from their face and expressions of affect, including their sexual orientation (e.g., Freeman et al., 2010) and political affiliation (e.g., Tskhay & Rule, 2015). Second, masculine and feminine stereotypes exist for cisgender men and women, respectively, and cisgender male and female faces are perceived differently when expressing different emotions (e.g., Hess et al., 2004; Wells et al., 2016). One of the few studies (Gallagher & Bodenhausen, 2021) that examined gender stereotypes for cis- and transgender men and women with a

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multimethod approach confirmed that cisgender people hold traditional gender stereotypes toward cisgender men and women, but that these stereotypes do not transfer to transgender people. Instead, cisgender people appear to hold largely negative stereotypes toward transgender people. These stereotypes are de-gendered in the sense that they do not differentiate between transgender men and women. On the other hand, there is also some evidence suggesting the opposite possible, such that transgender people are expected to conform to their gender-stereotypical behavior more strongly. In particular, in a study where cisgender participants were given a vignette about a masculine-appearing woman being harassed in the women's bathroom and asked their opinion, they found that some participants tended to "cisgender" the situation by either positing that she should engage in emotional work often associated with women (i.e., apologizing, staying calm, etc.) or they conceptualized her as more masculine and suggested she act in line with that by engaging in more dominating or aggressive behavior (Mathers, 2017). Together, these findings raise the question whether people would perceive expressed emotions by transgender men and women to be more like each other than like cisgender men and women, or if they would amplify gender stereotypes for transgender people. Third, examining potential effects of gender identity beyond the assigned gender-at-birth provides a way to test whether top–down influences of more abstract concepts, such as gender identity, would influence face processing (see Adams & Kveraga, 2015; Oswald & Adams, 2023). On the other hand, showing that gender identity does not influence processing of expressed emotions would speak more strongly to lower-level factors, such as facial morphology, to be key to face processing. Of course, it is possible that these factors play independent or interactive roles.

There is extensive research on recognizing expressed emotions, on gaze processing, and on processing differences when perceiving male versus female faces. The following sections provide a brief review about the literature on the link between emotion and gaze, gender and gaze, and gender and emotion before introducing the hypotheses and design.

Expressed Emotion and Gaze Direction

Several studies considered the effect of expressed emotion and gaze direction on a variety of processes, including emotion recognition and attention. Previous work on emotion recognition and gaze processing suggests that the two may interact, but that the extent to which they do may depend on a range of factors, including discriminability (e.g., Graham & LaBar, 2007), processing speed, individual differences, context, and expectation (Adams et al., 2010; Adams & Nelson, 2011; see Graham & LaBar, 2012, for a review). According to the *shared signal hypothesis* (Adams & Franklin, 2009), processing of facial expressions is efficient when emotional valence is congruent with approach tendencies present in direct gaze or avoidance tendencies present in averted gaze. To translate this to specific emotions, this hypothesis predicts that approach-related emotions, such as joy and anger, are more efficiently processed when coupled with direct gaze. Conversely, avoidance-related emotions, such as fear and sadness, are more efficiently processed when coupled with averted gaze. For example, Adams and Kleck (2003) reported two studies in which participants viewed facial expressions displaying different emotions. After viewing each expression, participants indicated which emotion expression a face displayed. Anger and joy were more quickly labeled when they were coupled with direct gaze and fear, and sadness was more quickly labeled when coupled with averted gaze (Adams et al., 2003; Adams & Kleck, 2003). Interestingly, Adams and Franklin (2009) showed that the interaction between gaze direction effects and emotion expression in a gaze direction judgment task was most pronounced in slow responders. Thus, different interaction patterns may emerge depending on whether an emphasis is placed on reaction times.

Albohn et al. (2022) more recently examined the impact of congruent versus incongruent combinations of emotion expression signaled by facial expressions, gaze directions, and body postures. These authors showed that signals from these different channels were integrated more when one of the channels was less intense or more ambiguous. For example, eye gaze was recruited and integrated in emotion perception more when emotion expression, be it from the face or body, was more ambiguous. This was done in an interactive manner consistent with the shared signal hypothesis. These authors (Albohn et al., 2022) concluded that when more information is needed in one channel, other channels may be recruited to help disentangle the perceptual ambiguity. The recruitment of different channels will likely depend on processing speed as well (Graham & LaBar, 2012).

Studies have also examined how emotion and gaze influences attentional capture. For example, Pittig et al. (2023) recently asked participants to identify target letters that appeared on the foreheads of one of four face models they viewed on a computer screen. These faces differed in terms of gaze direction (direct or averted), motion (static or change of gaze direction during a trial), and expressed emotion (including neutral, angry, fearful, happy, and disgusted expressions). Participants identified targets shown on a face with direct gaze more efficiently than a target shown on a face with averted gaze, especially when direct gaze was coupled with an angry expression. Showing direct versus averted gaze on fearful faces eliminated the direct gaze effect. Overall, work on attention capture through gaze cueing provides mixed results, however, as the interaction between gaze and emotion seems to depend on stimulus features such as stimulus-onset asynchronies and discriminability, as well as reaction times (see Graham & LaBar, 2012, for a review).

Overall, the findings suggest that direct gaze paired with angry expressions provide a salient signal that people detect quickly and that influences processing. Several studies (e.g., Adams et al., 2003; Adams & Kleck, 2003; Breil et al., 2022) have found a similar saliency effects for fearful or disgusted faces (i.e., avoidance-oriented expressions) displaying averted gaze.

Gender and Expressed Emotion

Previous research consistently indicates that women are stereotyped to be more emotional in general (e.g., Brody & Hall, 2000; Shields, 2000) and more strongly associated with expressions of happiness, fear, and sadness (Briton & Hall, 1995; Fabes & Martin, 1991) than men. Hess et al. (2004) went beyond these stereotypes and examined potential gender-stereotypic effects when participants perceive the facial expressions of men versus women. Their results suggested that participants perceived women's expressions of anger as less intense than men's angry expressions. Hess et al. (2004) argued that women have had less social power and therefore have shown more signs of appeasement, such as by smiling more and appearing to be more affiliative. These authors further hypothesized, based on prior research on social dominance and gender stereotypes, that women would be seen as less angry and more affiliative than men. Contrary to their hypotheses, the results of two experiments indicated that participants rated women as angrier and men as happier, even after controlling for facial appearance.

Other studies have shown differences in the perception of expressed emotions between men and women, with varying results. For example, Wells et al. (2016) asked participants to recognize expressed emotions while they varied biological sex, as well as the type (using anger, fear, disgust, sadness, happiness, and surprise) and intensity of the expressed emotion across images. In these studies, recognition accuracy increased with intensity of the expressed emotion. Recognition was fastest for happy expressions and slowest (and least accurate) for fearful expressions. Interestingly, responses were slower but more accurate for female than male faces, regardless of the expressed emotion. It is currently not clear what gave rise to this effect. In general, more work is needed to fully understand differences in face processing for male and female faces, as well as for different gender identities.

Emotion, Gender, and Gaze Direction

Three previous studies have explored the link between emotion, gaze, and gender (binary). In one study, Ohlsen et al. (2013) used emotion as a prime by showing participants pictures of threatening situations (e.g., pictures of attacks or combat) or pleasant situations (e.g., pictures of nice landscapes or cute animals). They then asked participants to complete a letter-detection task with letters showing up on the sides of the screen while pictures of faces appeared in the center of the screen. Biological sex of the model and gaze direction were manipulated. The results indicated that gaze direction influenced performance for both primes for the dominant male face, but only after no-threat primes for the nondominant female face. In other words, threat perception interacted with gaze processing and biological sex of the model. The authors suggest that face and gaze processing is modulated by emotional context.

The study just described did not manipulate expressed emotion of the perceived faces. As described earlier, Hess et al. (2004) suggested that ratings of expressed emotion intensity may be driven by differences in gender stereotypes. Slepian et al. (2011) indicated that differences between genders may also arise due to differences in facial morphology. As men and women differ in terms of the alignment of bone structures in the face, such as the positioning of their jawlines, Slepian et al. (2011) predicted that the relationship between expressed emotions and direct gaze perception would differ for male versus female faces. To test this prediction, participants viewed female and male faces displaying angry, joyful, fearful, and neutral expressions. Half of these images displayed direct gaze, and the other half displayed averted gaze to the right or left by 4° or 8° (Slepian et al., 2011). Participants were asked to identify whether the shown face was looking directly at them. In the second study, the researchers also controlled for differences in facial morphology while retaining their gendered appearance. Somewhat consistent with prior research on gaze effects for emotion perception, the approach-oriented emotions of joy and anger received the highest direct-gaze attributions of the four expressions, followed by neutral expressions. Fearful expressions received the lowest number of direct-gaze attributions. Although these findings align with the notion that approach-oriented expressed emotions are most quickly recognized when coupled with direct gaze, previous literature suggested that this effect was strongest for angry rather than joyful expressions (Adams & Kleck, 2003). Interestingly, controlling for facial morphology changed the ratings for apparent male and female faces (Slepian et al., 2011), such that angry and joyful faces were equally perceived to have direct gaze for androgynous faces, but joyful faces were more quickly seen to have direct gaze for female faces. These findings suggest that facial morphology may play a more important role in emotion recognition than gender stereotypes (in contrast to Hess et al., 2004), and that gender-related facial appearance and emotion expression may share both social meaning and physical resemblance (thus, creating a potential confound; see Adams et al., 2015). Gender identity was not explored in these studies.

Finally, McCrackin and Itier (2019) addressed discrepancies in the face processing literature that may reflect differences in the kinds of tasks employed. These researchers manipulated gaze direction, expressed emotion, and gender appearance of the model across images while participants were tasked with either classifying gaze direction, expressed emotion, or gender of the observed faces. Their results indicated that participants most accurately discriminated emotions when paired with direct gaze, but they performed best on the gaze classification task for images with averted gaze. Gender discrimination was not affected by gaze direction. Taken together, these findings indicate that the interactions between gaze direction, emotion, gender appearance, and gender identity are far from clear.

The Present Study

Previous research suggests a salient interaction between expressed emotions and gaze direction processing. Specifically, Adams and Kleck (2003), Pittig et al. (2023), and Slepian et al. (2011) found the most efficient processing when approach-oriented expressions were coupled with direct gaze. Additionally, there are notable differences in the ways in which participants rate the intensity of expressed emotions of male versus female faces. Hess et al. (2004) proposed that gender stereotypes may explain these differences in ratings, whereas Slepian et al. (2011) suggested that these effects may be due to facial morphology. While both point to differences in perceptions of male versus female faces, neither study has examined the potential differences in participant ratings of expressed emotions when presented with gender categories outside of the binary sexes. Thus, previous literature has homogenized gender appearance with gender identity.

Here, we seek to disentangle the role of gender appearance and gender identity for the perception of faces with different gaze directions and emotion expressions. We examined differences in the perception of expressed emotions when participants were told that the presented face belonged to a person who was either male or female and was cisgender or transgender. Examining the link between emotions and gender identity is important as emotions may be used to communicate ambiguous group membership, such as those relating to sexual and political preferences (e.g., Tskhay & Rule, 2015). We manipulated gaze direction and expressed emotion by showing angry, fearful, or neutral expressions with either direct or averted gaze. Finally, we investigated how differences in participant attitudes toward gender identities influenced facial expression recognition to take seriously the notion that person perception may involve contributions of both perceiver and target characteristics (e.g., Hehman et al., 2017).

We predicted several previously established effects. First, we predicted finding a direct gaze effect, such that faces with direct gaze would be classified more quickly than those with averted gaze (e.g., Adams & Kleck, 2003; Böckler et al., 2014; von Grünau & Anston, 1995). We also predicted an effect of displayed emotion, such that fearful faces should be responded to more quickly than angry faces (e.g., Wells et al., 2016). We predicted an interaction between gaze and emotion, such that angry faces with direct gaze should be rated more quickly and as looking angrier than faces with averted gaze, whereas fearful faces should be rated more quickly and as more fearful for averted rather than direct gaze. With respect to gender and gender identity, we expected to find differences between male and female images due to differences in facial morphology, regardless of their gender identity. Specifically, we predicted that male faces would be rated as looking angrier, whereas female faces would be rated as looking more fearful, regardless of gaze direction. If face processing is also influenced by gender identity, we would expect to see differences in emotion perception when participants viewed the same male and female face images but were told that they belonged to different gender identities.

Method

Transparency and Openness

We tested 74 participants. This sample size was partly based on estimates of power calculations with G*Power 3.1 (Faul et al., 2007). A complicating factor for calculating these estimates a priori was whether they should be based on reaction times (RTs) or ratings. Second, we predicted several main effects and interactions (e.g., for gaze direction and expressed emotion), while testing additional main effects and interactions for which predictions were less clear. Third, we did not have previous data for gender identity to use for these calculations. We therefore report observed power for each of our findings below to provide indications of the extent to which appropriate power was achieved. Of the 74 participants, 27 self-identified as a cisgender male; 39 identified as a cisgender female; five identified as nonbinary, genderqueer, or as another third gender category; and three participants did not respond to this question. We did not collect information on participants' ages, racial identity, ethnicity, immigration history, or socioeconomic status. The general composition of the participant pool we draw from mostly ranged between 18 years and 22 years of age and is relatively diverse (Rutgers-Camden is a minority-serving institution). Participants had normal or corrected-to-normal vision. They completed a written informed consent form, and an experimental investigator presented a standardized instruction. Participants received course credit for their participation. The Rutgers University Institutional Review Board ethics committee approved this research under expedited review. We did not preregister our study. The study only used newly collected data (all data and code are available at https://osf.io/x4hu9/).

Design and Measures

The study consisted of two parts; first, participants completed a survey aimed to quantify their level of openness and tolerance toward different gender identities. We describe the details of this survey below. Second, participants completed the experimental portion of our study. During the experimental portion, participants rated the expressed emotion on a set of faces that varied in terms of Gender Appearance (male or female), Gender ID (cisgender or transgender), Gaze Direction (direct or averted), and Expressed Emotion (neutral, fearful, or angry). Thus, we employed a $2 \times 2 \times 2 \times 3$ within-subject design. We provide full experimental details after describing our survey measure.

For our survey, we included (a) 10 items (using a 5-point scale) measuring Openness to Experiences from the Big 5 Personality Inventory (John & Srivastava, 1999); (b) a self-report question on participant's gender identity; and (c) 23 items from a previously validated Gender/Sex Diversity Beliefs Scale (Schudson & van Anders, 2022). Several items from the Gender/Sex Diversity Beliefs Scale examined tolerance to diverse gender identities. The questionnaire asked participants to rate a set of statements by indicating how much they agree with a statement on a scale from 1 to 7. For example, one question asked participants to rate how strongly they agree with the statement "Nonbinary gender identities are valid" (Schudson & van Anders, 2022, p. 1020). Higher scores on this question are taken to imply higher tolerance. Conversely, another question stated "A real man needs to be masculine" (Schudson & van Anders, 2022, p. 1020). For this question, higher ratings implied lower tolerance of diverse gender identities. The full questionnaire can be found in the Appendix. In our Results section, we report an exploratory analysis to determine if openness to gender identity-related concepts would scale with ratings and response time differences. We used the Gender/Sex Diversity Beliefs Scale and determined which items may correlate with higher tolerance of diverse gender identities, which items may correlate with lower tolerance, and which items were neutral. We predicted that items 1–14 would reliably measure a participant's tolerance levels, and items 15, 16, and 19–21 would measure a participant's intolerance levels. Items 17, 18, and 22–23 were marked as neutral items and were excluded from further analysis. We then reverse scored the intolerance items and ran a reliability analysis for the summed score of tolerance and intolerance items. Cronbach's α for this full tolerance scale that comprised 19 items was .931, indicating strong reliability. Six participants did not respond to one or more of the items of the Gender/Sex Diversity Beliefs Scale that we predicted would determine participant tolerance, and their scores were discarded.

For the experimental portion, we used previously validated photographs from the Radboud Faces Database (RaFD; Langner et al., 2010). This database provides sets of the same facial images displaying eight distinct facial expressions coupled with direct or averted gaze. Previous work has shown that the database provides adequate visual stimuli for studies examining facial expression recognition (e.g., Dores et al., 2020).

Procedure

We tested participants individually at a research lab on the Rutgers University-Camden campus. Participation generally lasted approximately 40–45 min. After reading and signing the consent form, researchers instructed participants on how to complete the survey questionnaire. Completion of the consent form and questionnaire took participants roughly 10 min.

After completing the questionnaire, the experimenter asked participants to listen to instructions on the upcoming blocks they were to complete. The following instructions were given:

> You will complete a number of trials. In the first part of the trial, you will view a photo of a person and then read a couple of sentences about them. You will then view pictures of the same person displaying different expressions. You will be asked to rate the expression of the person on a scale from −5 to +5, with zero in the middle. When rating these expressions, you will tap the corresponding key labeled on the keyboard at your assigned computer. −5 on the scale means very fearful, 0 on the scale means neutral, and +5 on the scale means very angry. After rating these expressive images, you will be asked to recall a piece of information from the two sentences you read at the beginning of each trial. At the end of all trials, your participation will be complete.

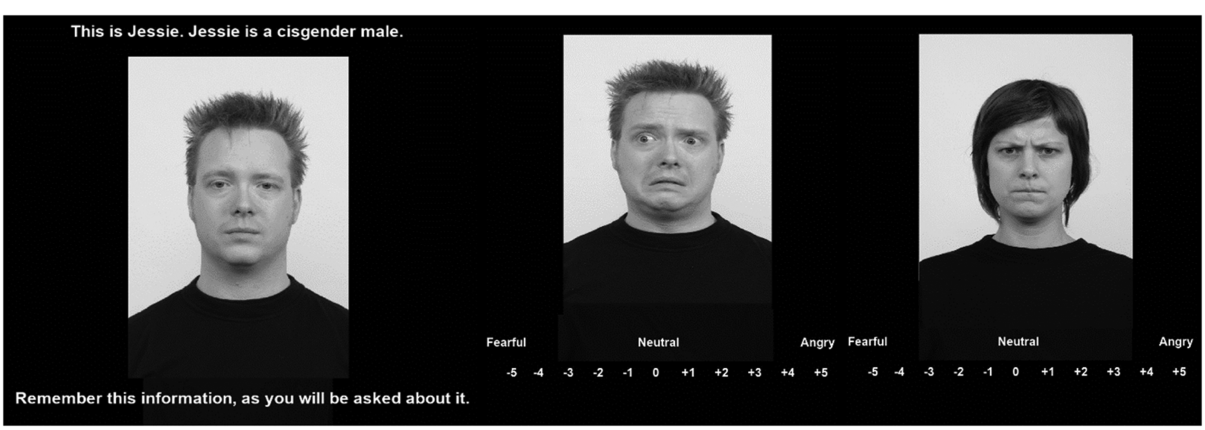
After ensuring that the participant understood the instructions, the experiment began. Figure 1 shows an example of an image shown at the start of the block, as well as an example of a single trial. In the beginning of each block, participants were first presented with a photo of a person's face displaying a neutral expression with direct gaze (Figure 1, left panel). Underneath this photo, participants read fictitious information about the person they were viewing, indicating the name of the face model (randomly assigned from a list of 32 names considered to be relatively gender neutral) and whether they were male or female and cisgender or transgender. We used gender-neutral names to increase plausibility of matches between faces and their stated gender identities. The assignment of names to faces was fully randomized over blocks and across participants. The names we used were Adrian, Alex, Ari, Avery, Cameron, Carey, Casey, Charlie, Devan, Dylan, Elliot, Evan, Harlin, Jamie, Jessie, Jordan, Kerry, Kris, Milan, Morgan, Parker, Pat, Quinn, Remy, Rene, Robbie, Robin, Riley, Ryan, Sawyer, and Skylar. We did not provide other information about the individual, but we informed participants that they needed to remember the person's gender and gender identity because the participant would be asked to recall this information after the block of trials. To ensure that participants had processed the gender identity information of the face image, they then answered what the gender and gender identity of the person in the block was by entering a number between 1 and 4 on the keyboard. The assignment of numerical responses to gender and gender identity was randomized across blocks. Participants indicated gender and gender identity once before the start of the block, and then again after the block ended. The arrangement of numerical values to gender identities changed for these two recall tasks to ensure that participants did not just remember the correct number to press. While we put ratings of fearfulness on one end and anger on the other end of our scale, we did not do so to imply that they must be viewed as opposite emotions. For our experiment, we simply intended to create a scale on which participants could rate their own perceptions of the fearful/neutral/angry expressions and their intensity by using different parts of the scale. The inclusion of fear and anger was based on previous literature suggesting that those two emotions would be most likely to show modulation based on gaze and gender.

The experiment consisted of 192 trials in total, which were divided into 32 blocks. In each block, participants viewed six photos of the same face model displaying direct or averted gaze paired with angry, neutral, and fearful expressions. Figure 1 (center and right panels) shows example trials. Images displaying averted gaze always looked toward the right side of space. The order of faces within a block, as well as the assignment of faces to gender identities within female and male faces, was fully randomized. Thus, we used 16 male and 16 female face models, half of which were assigned to the cisgender conditions and half to the transgender conditions. Doing so ensured that potential differences based on gender identity could not be explained based on differences in facial morphology.

In each trial, participants rated the expression of the person in the photo they saw on a scale from fearful to angry, with neutral in the middle. Participants provided their ratings by entering their corresponding keys, with fear ratings labeled on the keyboard with keys ranging from −1 to −5, anger ratings labeled with keys ranging from +1 to +5, and neutral labeled with 0. We showed these labels on the response keys by putting stickers on the 1 to – keys on the top row of an otherwise standard QUERTY keyboard. The key labels and rating scale were visible on the keys and on screen, respectively,

Figure 1

Example Displays



Note. The image on the left shows what participants saw before the start of a block of six trials, after which they had to recall the gender identity of the person. The image in the center is an example of a trial displaying fear with averted gaze in the block following the image on the left. The image on the right is another trial example image from a different block, displaying anger with direct gaze. Single trials always showed the same rating scale on the bottom of the screen. Images from Radboud Faces Database (RaFD; Langner et al., 2010). The database is freely available for use in scientific publications.

throughout the trials, and their alignment stayed constant throughout the experiment. The instructions emphasized accuracy over speed to ensure that participants provided ratings that reflected the displayed emotion. We added this instruction as participants could in principle press the same key response throughout, regardless of displayed emotion.

At the end of each block, participants again recalled the gender and gender identity of the face model that was stated before the start of the block by typing in the corresponding labeled key on the keyboard. After responding, participants saw on the screen whether their response was correct or incorrect. After this feedback, participants continued with the next block, until completion of all 32 blocks.

Participants generally completed all blocks in approximately 30–35 min. We debriefed each participant and notified them that they received credit for their participation before they exited the lab.

Data Preparation

We used Matlab and SPSS for data analysis. Before analyzing our data, we first ensured to only include blocks of trials for which participants correctly recalled the gender and gender identity combination after the block. In addition, we removed any participants for whom the accuracy of their recall was below 90%. Doing so resulted in the removal of six participants. None of the included participants had more than three blocks of data (out of 32 blocks) removed. Finally, we removed data on a single trial level if fearful faces were rated as zero or as angry (and vice versa), or if neutral faces received a rating below −2 and above 2, as those ratings likely reflected errors. This screening process also ensured that there were five possible responses for each emotion. It resulted in the removal of 316 additional trials (on average, 4.16 out of 192 trials per participant). It should be noted that, based on this cleaning of the data, the emotion ratings would be expected to show a (trivial) significant main effect of Expressed Emotion. While neutral responses were always in the middle of the range and may be faster to execute as a result, it is important to remind the reader that the order of images was randomized within a block. In other words, participants did not necessarily start a trial with their index fingers in the middle of the response scale. In addition, any potential bias in this regard would not be able to account for differences in response times based on gaze direction, gender appearance, or gender identity within a given emotion.

We calculated the median rating and response time for each face based on our manipulations of Gender Appearance (M/F), Gender ID (cis/trans), Expressed Emotion (neutral/fearful/angry), and Gaze Direction (direct/averted). In most cases, these median values were based on the eight instances of each level of our manipulations, unless a block of trials was removed due to inaccurate recall of gender identity after the block. Median values were always based on at least six accurate trials per cell. We opted for median rather than mean values before we analyzed the data (and have not analyzed the data based on mean values) to reduce the potential for an unduly influence of outliers. Data and code are available in the Open Science Framework (https://osf.io/x4hu9/).

Results

We analyzed the median emotion ratings participants provided and their median response times (RTs) with a 2 (Gender Appearance) × 2 (Gender ID) × 2 (Gaze Direction) × 3 (Expressed Emotion) repeated-measures analysis of variance. We present the results of these analyses together, as doing so provides a more coherent understanding. We applied a Greenhouse–Geisser correction to the degrees of freedom when the sphericity assumption was violated. We applied Bonferroni corrections to our multiple comparisons *t* tests, and we report the corrected *p* values.

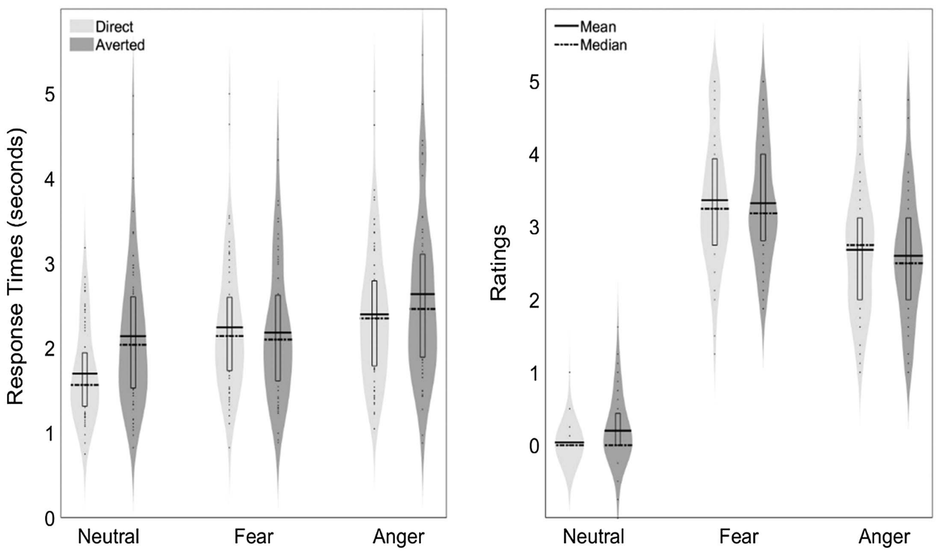
Gaze Direction, Expressed Emotion, and How They Relate

Consistent with the results of previous studies (e.g., Böckler et al., 2015; van der Wel et al., 2018), the analysis of RTs showed the predicted main effect of Gaze Direction, such that participants responded faster to direct gaze (M = 2.115, SE = .076, 95% CI [1.963, −2.267]) than to averted gaze (M = 2.321, SE = .094, 95% CI [2.133, −2.508]), $F(1, 67) = 31.949$, $p < .001$, $\eta^2 = .323$, observed power = 1 (e.g., Bindemann et al., 2008; Boyer & Wang, 2018; Conty et al., 2016; Senju & Johnson, 2009). Ratings did not systematically depend on Gaze Direction, $p > .10$. RTs also showed a main effect of Expressed Emotion $F(1.762, 118.074) = 30.612$, $p < .001$, $\eta^2 = .314$, observed power = 1, such that RTs to neutral faces (M = 1.921, SE = .077, 95% CI [1.767, −2.075]) were shorter than to fearful (M = 2.215, SE = .093, 95% CI [2.029, −2.400]) and angry faces (M = 2.518, SE = .110, 95% CI [2.298, −2.738]), and RTs to fearful faces were shorter than to angry faces (in line with Slepian et al., 2011). Finally, ratings showed a significant effect of Expressed Emotion, $F(1.121, 75.098) = 919.988$, $p < .001$, $\eta^2 = .932$, observed power = 1. This effect was not surprising given that this rating difference was essentially a consequence of the experimental task. These effects are depicted in Figure 2.

Importantly, and of key interest based on previous literature, both analyses qualified these main effects with an interaction between Expressed Emotion and Gaze Direction for ratings, $F(2, 134) = 7.156$, $p < .01$, $\eta^2 = .097$, observed power = .998, and RTs, $F(2, 134) = 14.058$, $p < .001$, $\eta^2 = .173$, observed power = .926. Figure 2 displays this interaction (in each of the following result figures, we show violin plots with median values and box plots showing interquartile range, minima, and maxima). While direct gaze elicited shorter response times than averted gaze for angry faces ($p = .002$, Direct: M = 2.399, SE = .098, 95% CI [2.204, −2.594]; Averted: M = 2.637, SE = .132, 95% CI [2.373, −2.901]) and neutral faces ($p < .001$, Direct: M = 1.701, SE = .065, 95% CI [1.570, −1.831]; Averted: M = 2.141, SE = .102, 95% CI [1.938, −2.344]), participants responded more quickly to averted gaze for fearful faces (in line with Adams & Kleck, 2003), although the latter difference did not reach statistical significance (Direct: M = 2.245, SE = .094, 95% CI [2.057, −2.434]; Averted: M = 2.184, SE = .097, 95% CI [1.991, −2.377]). When considering these differences within gaze direction, our results for direct gaze showed that participants had shorter RTs for fearful faces than to angry faces ($p = .027$), and they had shorter RTs for neutral faces than to fearful and angry faces (all $p < .001$). For averted gaze, they responded slower to angry faces than neutral and fearful faces (all $p < .001$), whereas response times to neutral and fearful faces did not differ significantly. The interaction between Expressed Emotion and Gaze Direction for ratings showed that angry faces were perceived as angrier for direct versus averted gaze ($p = .002$), while the opposite was found for neutral faces ($p = .029$). The ratings for fearful faces did not systematically depend on gaze direction, $p > .05$.

Figure 2

Violin Plots Show the Interaction Between Gaze Direction and Expressed Emotion for Median Response Times (Left Panel) and Median Ratings (Right Panel)



Note. For fear and anger, higher ratings correspond to more fearful and angrier, respectively. For neutral faces, higher ratings indicate that faces were rated as angrier. A box plot is shown for each condition as well.

The Interaction Between Expressed Emotion, Gender Appearance, and Gender Identity

Next, we examined whether Gender Appearance and Gender ID modulated the effects reported above. This investigation is important because previous literature has never orthogonally manipulated gender and gender identity. Addressing whether gender appearance and/or gender identity influences the processing of gaze and emotion expression speaks to whether previously reported differences between male and female faces may be due to low-level differences in facial morphology, due to higher level concepts related to gender identity, or both. It is important to note that gender effects based on differences in facial morphology between the male and female faces have been shown previously (see, e.g., Slepian et al., 2011) and should emerge here, because we did not control for facial morphology across male and female images. Gender ID effects, however, could not be explained based on facial morphology in our stimuli.

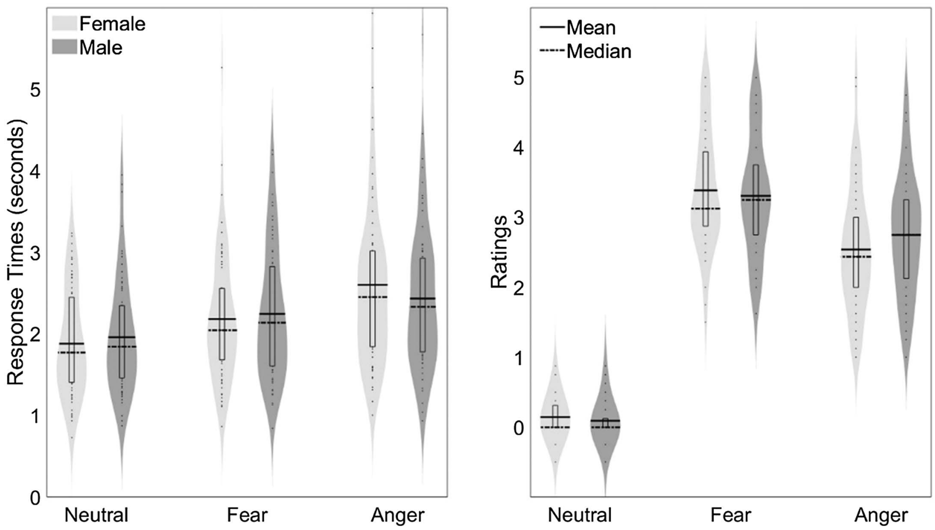
As predicted, our results showed a main effect of Gender Appearance for ratings, $F(1, 67) = 30.612$, $p < .001$, $\eta^2 = .143$, observed power = .910, with females being rated to look more fearful than males, abs (absolute value) Female: $M = .233$, $SE = .030$, 95% CI [.174, −.293]; abs Male: $M = .155$, $SE = .029$, 95% CI [.097, −.213]. No main effect on RTs was found, $p > .10$. Gender Appearance and Expressed Emotion interacted for ratings, $F(1.555, 103.867) = 8.373$, $p < .001$, $\eta^2 = .111$, observed power = .920, and for RTs, $F(1.704, 114.155) = 6.482$, $p < .01$, $\eta^2 = .088$, observed power = .862. Figure 3 shows these interactions. Consistent with previous findings (e.g., Slepian et al., 2011), participants rated angry expressions more quickly ($p = .022$, Male: $M = 2.434$, $SE = .107$, 95% CI [2.220, −2.649]; Female: $M = 2.601$, $SE = .124$, 95% CI [2.355, −2.848]) and intensely ($p < .001$, Male: $M = 2.748$, $SE = .106$, 95% CI [2.536, −2.960]; Female: $M = 2.540$, $SE = .108$, 95% CI [2.325, −2.756]) for male faces than female faces. While numerically they rated a fearful expression more quickly and intensely for female faces (abs $M = 3.386$, $SE = .102$, 95% CI [3.182, −3.590]) than male faces (abs $M = 3.386$, $SE = .102$, 95% CI [3.182, −3.590]), this difference did not reach conventional thresholds of statistical significance after correction. The other interactions also did not reach significance, $p > .10$.

Of key interest, ratings showed a Gender Appearance × Gender ID interaction, $F(1, 67) = 20.206$, $p < .001$, $\eta^2 = .232$, observed power = .993, and a Gender Appearance × Gender ID × Expressed Emotion interaction, $F(1.447, 96.949) = 12.097$, $p < .001$, $\eta^2 = .153$, observed power = .977. Figure 4 shows this interaction. We describe this interaction based on comparisons within Gender Appearance, as these comparisons cannot be explained by differences in facial morphology (the same faces were used). Whereas Gender ID and Gender Appearance did not influence ratings for neutral and fearful faces, it showed an influence for angry faces. While cisgender females were rated to look angrier than transgender females ($p < .001$, cisgender female: $M = 2.673$, $SE = .109$, 95% CI [2.456, −2.889]; transgender female: $M = 2.408$, $SE = .120$, 95% CI [2.169, −2.648]), transgender males were rated to look angrier than cisgender males ($p < .001$, cisgender male: $M = 2.621$, $SE = .108$, 95% CI [2.405, −2.838]; transgender male: $M = 2.875$, $SE = .113$, 95% CI [2.650, −3.100]).

Finally, RTs indicated a Gender Appearance × Gender ID × Gaze Direction interaction, $F(1, 67) = 17.927$, $p < .001$, $\eta^2 = .211$, observed power = .987; see Figure 5. Responses for averted gaze had numerically longer RTs than direct gaze for each Gender Appearance with Gender ID combination, but this was especially the case for female transgender and male cisgender faces (both $p < .001$). Finally, when considered within a given gender identity, response times to averted gaze were faster for cisgender females than cisgender males ($p = .021$). For transgender faces, response times to averted gaze were faster for male faces than female faces ($p = .04$).

Figure 3

Violin Plots for the Two-Way Interaction Between Gender Appearance and Expressed Emotion for Median Response Times (Left Panel) and Median Ratings (Right Panel)



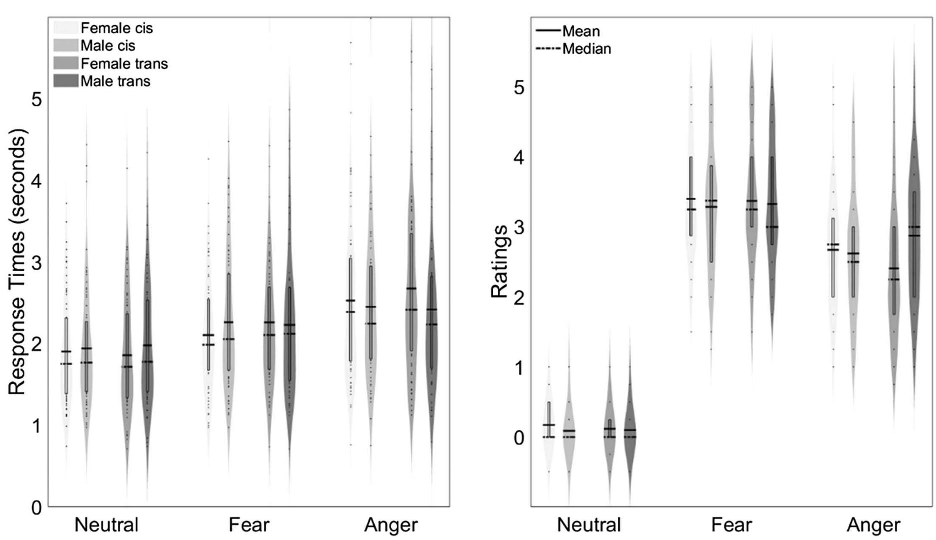
Note. For fear and anger, higher ratings correspond to more fearful and angrier, respectively. For neutral faces, higher ratings indicate that faces were rated as angrier. Box plots are also shown for each condition.

Correlational Analyses

Our results suggest that Gender Appearance and Gender ID influence face processing. To further explore this finding, we focused on the most straightforward effect to reflect this in our results. In particular, we used the two-way interaction between Gender Appearance and Gender ID for emotion ratings, suggesting that females were rated as angrier looking when they were cisgender and males were rated as angrier looking when they were transgender (see Figure 4), $F(2, 134) = 30.612$, $p < .001$. Thus, this effect seems to reflect a form of hypergendering rather than de-gendering. If this is the case, it raises the question whether those who are more tolerant of different gender identities would show this form of hypergendering more strongly or not. To explore this possibility, we specifically calculated the difference in ratings for angry expressions

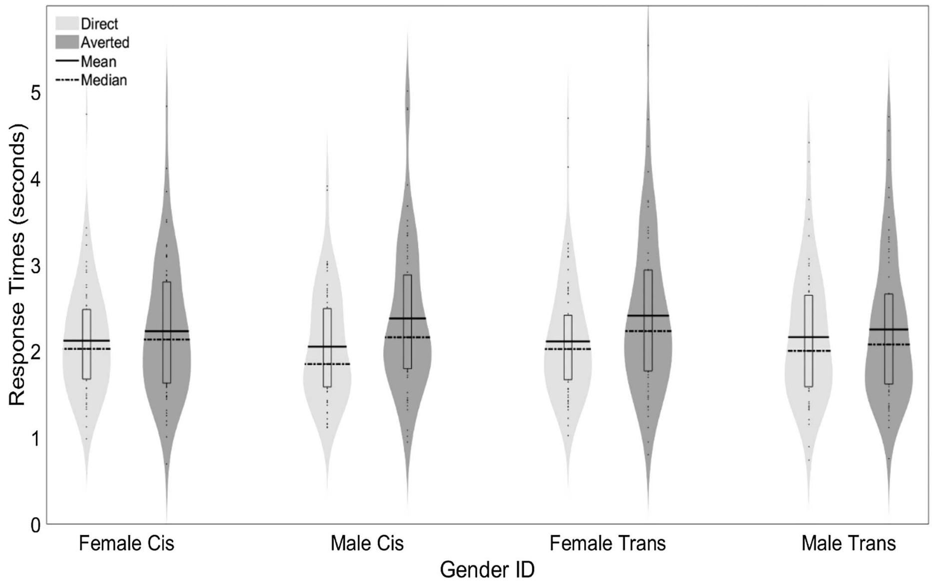
Figure 4

Violin Plots for the Three-Way Interaction Between Gender, Gender Identity, and Expressed Emotion for Median Response Times (Left Panel) and Median Ratings (Right Panel)



Note. The ratings for neutral and anger indicate how angry participants perceived the face to appear. We reversed the sign of the ratings for fear images for plotting purposes to ease interpretation. Ratings for fear indicate how fearful participants perceived the face to appear. Box plots are also included for each condition.

Figure 5
Violin Plots for the Interaction Between Gender Appearance, Gender Identity, and Gaze Direction for Response Times



between male transgender and female transgender faces because this difference showed to be the largest change driving that interaction. We then correlated the resulting difference scores with a composite score of our tolerance scale (i.e., by summing the scores of all 19 items on that scale). The results failed to show a significant correlation, $r(68) = .055$.

Discussion

The purpose of the present study was to examine how expressed emotion, gaze direction, gender appearance, and gender identity of perceived faces influence how participants rated their facial expressions. Separating potential effects of gender appearance from gender identity was particularly important, as previous studies have never isolated these two factors (i.e., by presenting either male or female faces with unspecified gender identity). Although previous studies have shown effects of morphological differences between male and female faces in the interpretation of expressed emotions, it is possible that factors other than facial morphology, such as gender identity, influence face perception (see Hess et al., 2004). We manipulated gender appearance and gender identity in addition to the previously studied factors expressed emotion and gaze direction. Participants were primed before each experimental block by giving them information on the gender appearance and gender identity of the person whose expressions they rated in the following block. We ensured that participants paid attention to this information by asking them to recall the person's gender appearance and gender identity after the block of trials. Importantly, we used identical sets of images for cisgender and transgender faces within each gender appearance (i.e., the same set of morphologically female faces was used for female cisgender and female transgender faces, with their assignment fully counterbalanced across participants. The same was true for male faces). Thus, differences due to the factor gender identity could not be explained based on differences in facial morphology.

Our findings replicate several established effects. First, faces with direct gaze were processed more quickly than faces with averted gaze (i.e., the direct gaze effect; see Adams & Kleck, 2003; Böckler et al., 2014; von Grünau & Anston, 1995). While most previous studies showing this effect emphasized responding as quickly as possible, this was not the case in our study. As such, this replication speaks to the generality of the direct gaze effect. Second, ratings and response times depended on the expressed emotion. Ratings clearly indicated that angry faces looked most angry, fearful faces most fearful, and neutral faces appeared neutral. In addition, participants responded fastest to neutral faces, followed by fearful faces and then angry faces. This finding is in line with previous literature (Slepian et al., 2011) suggesting that avoidance-oriented emotions (e.g., fear) are more readily processed than approach-oriented emotions (e.g., anger). It is not clear, however, why neutral faces were rated more efficiently than the other faces. Previous work employing visual search paradigms in which participants need to find one odd-ball facial expression among a set of faces suggested that neutral faces are detected less efficiently than emotional faces (Eastwood et al., 2003; Hansen & Hansen, 1988; Hood et al., 2003; Sato & Yoshikawa, 2010; Skinner & Benton, 2012). Recently, it has been argued that the inherent reward value of expressed emotions may be responsible for this effect. Saito et al. (2022) showed that pairing neutral faces with either positive or negative outcomes through associative learning resulted in changes in response times for those neutral faces. Within our paradigm, neutral faces did not carry reward value, and should have been detected more slowly than fearful and angry faces. One possible explanation for our finding is related to response key alignment. As participants used both hands to provide ratings and ratings corresponding to the neutral values were in the center of the response scale, this arrangement may have given rise to shorter response times for the neutral faces. It should be noted that, while this may be the case, the arrangement would not account for differences in RTs due to gaze direction, gender appearance, or gender identity.

A third replication concerned significant interactions for ratings and response times between gaze direction and expressed emotion. Like previous studies (e.g., Adams & Kleck, 2003, 2005; Breil et al., 2022; Ganel et al., 2005; Pittig et al., 2023), we found that participants responded to angry faces more quickly and rated them as angrier looking when coupled with direct gaze than averted gaze. Conversely, participants responded faster to faces with averted gaze that displayed fearful versus angry expressions. This finding is important in the context of a debate on how the interaction between gaze processing and emotion processing may depend on processing speed (see Graham & LaBar, 2012). As our task did not emphasize responding as quickly as possible, RTs were relatively slow. Our results are consistent with the shared signal hypothesis, that is, the notion that gaze processing and emotion processing interact when there is enough time to do so (e.g., Adams & Franklin, 2009).

A final replication is that male faces were more quickly and intensely perceived for displays of anger, while female faces were generally rated to look more fearful. This finding supports the notion that morphological differences between male and female faces give rise to differences in the perception of expressed emotions as a function of gender appearance (e.g., Hess et al., 2004).

The key new finding from the study was that emotion processing was based on gender appearance and gender identity of the perceived face. Specifically, we found a two-way interaction between gender appearance and gender identity and a three-way interaction between gender appearance, gender identity, and expressed emotion for ratings. This interaction revealed that transgender females were rated to look less angry than cisgender females, whereas transgender males were rated to look angrier than cisgender males. This finding suggests that the existing gender stereotype of males being angrier than females seems to have been amplified (see Mathers, 2017) rather than de-gendered (see Gallagher & Bodenhausen, 2021) for transgender people (i.e., transgender females being seen as less angry, but transgender males being seen as angrier). There was no influence of gender identity on neutral or fearful faces. For reaction times, we also observed a three-way interaction between gender appearance, gender identity, and gaze direction, indicating that the difference between averted and direct gaze was more pronounced for transgender females and cisgender males.

While follow-up studies are needed, these results suggest that face processing is not impervious to factors other than facial morphology. In other words, emotional face processing can be modulated by higher order social factors because differences in ratings and response times as a function of gender identity could not be explained based on differences in the images themselves (i.e., they rated the same set of images across participants). Thus, our results suggest an influence of a social construct (i.e., gender identity) on face processing. Hence, the awareness of another individual's gender identity changes the ways in which we perceive their facial expressions, and this may affect how we interact with others in a multitude of social situations.

Constraints on Generality

To gain a comprehensive understanding of person perception and emotions in different contexts, it is of critical importance to understand characteristics of both the observed and the observer (e.g., Hehman et al., 2017). With this in mind, our final analysis attempted to link specific effects of gender identity on the ratings of emotion expressions with differences in a tolerance scale across individuals. This analysis was exploratory and post hoc because there was no previous literature to inform specific hypotheses. Our approach was to focus on the largest effect based on gender identity and then correlate the size of that effect across individuals with their individual tolerance score. The results of this analysis failed to show a correlation (in fact, the resulting correlation was close to zero). While one could argue that being more tolerant to gender identities may imply that ratings would vary more (as these concepts may be processed more deeply), another argument could be that increased tolerance should imply that gender identity should matter less for face perception. Further research is needed to examine these possibilities.

In addition, our sample largely consisted of relatively educated people (university students) in their early 20s who may have relatively open views on gender diversity. This point is important because the specific sample may also explain differences in some of the literature discussed in our introduction; while Gallagher and Bodenhausen (2021) reported de-gendering of transgender people in a relatively older sample (mean age in their 30s, with exact value depending on study) obtained through online data collection, Mathers (2017) instead reported forms of hyper-genderization based on a college-aged sample collected in a laboratory. These and other potential factors should be examined in larger samples, of various ages, and across different cultures and, potentially, political affiliations.

Conclusion

The present study represents the first known foray into the influence of gender appearance and gender identity effects in face perception. Our findings suggest that several previously reported effects replicate across different gender identities. These effects include the direct gaze effect (i.e., faster responses for direct vs. averted gaze) and emotion effect (i.e., faster responses for fearful than angry faces), as well as the interaction between gaze and emotion. While our results replicated differences between male and female faces that align with differences in facial morphology, they also indicate that top–down concepts such as gender identity may influence how we perceive and process emotions of other people. Thus, perception of faces involves more than just what is directly in front of us.

References

Adams, R. B., Jr., & Franklin, R. G., Jr. (2009). Influence of emotional expression on the processing of gaze direction. *Motivation and Emotion*, *33*(2), 106–112. https://doi.org/10.1007/s11031-009-9121-9

Adams, R. B., Jr., Franklin, R. G., Jr., Nelson, A. J., & Stevenson, M. T. (2010). Compound social cues in face processing. In R. B. Adams, Jr., N. Ambady, K. Nakayama, & S. Shimojo (Eds.), *The science of social vision* (pp. 90–107). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195333176.003.0006

Adams, R. B., Jr., Gordon, H. L., Baird, A. A., Ambady, N., & Kleck, R. E. (2003). Effects of gaze on amygdala sensitivity to anger and fear faces. *Science*, *300*, Article 1536, https://doi.org/10.1126/science.1082244

Adams, R. B., Hess, U., & Kleck, R. E. (2015). The intersection of gender-related facial appearance and facial displays of emotion. *Emotion Review*, *7*(1), 5–13. https://doi.org/10.1177/1754073914544407

Adams, R. B., Jr., & Kleck, R. E. (2003). Perceived gaze direction and the processing of facial displays of emotion. *Psychological Science*, *14*(6), 644–647. https://doi.org/10.1046/j.0956-7976.2003.psci_1479.x

Adams, R. B., Jr., & Kleck, R. E. (2005). Effects of direct and averted gaze on the perception of facially communicated emotion. *Emotion*, *5*(1), 3–11. https://doi.org/10.1037/1528-3542.5.1.3

Adams, R. B., Jr., & Kveraga, K. (2015). Social vision: Functional forecasting and the integration of compound social cues. *Review of Philosophy and Psychology*, *6*(4), 591–610. https://doi.org/10.1007/s13164-015-0256-1

Adams, R. B., Jr., & Nelson, A. J. (2011). Intersecting identities and expressions: The compound nature of social perception. In J. Decety & J. T. Cacioppo (Eds.), *The Oxford handbook of social neuroscience* (pp. 394–403). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195342161.013.0026

Albohn, D. N., Brandenburg, J. C., Kveraga, K., & Adams, R. B., Jr. (2022). The shared signal hypothesis: Facial and bodily expressions of emotion mutually inform one another. *Attention, Perception, & Psychophysics*, *84*(7), 2271–2280. https://doi.org/10.3758/s13414-022-02548-6

Bindemann, M., Burton, A. M., & Langton, S. R. H. (2008). How do eye gaze and facial expression interact? *Visual Cognition*, *16*(6), 708–733. https://doi.org/10.1080/13506280701269318

Böckler, A., van der Wel, R. P. R. D., & Welsh, T. N. (2014). Catching eyes: Effects of social and nonsocial cues on attention capture. *Psychological Science*, *25*(3), 720–727. https://doi.org/10.1177/0956797613516147

Böckler, A., van der Wel, R. P. R. D., & Welsh, T. N. (2015). Eyes only? Perceiving eye contact is neither sufficient nor necessary for attentional capture by face direction. *Acta Psychologica*, *160*, 134–140. https://doi.org/10.1016/j.actpsy.2015.07.009

Boyer, T. W., & Wang, M. (2018). Direct gaze, eye movements, and covert and overt social attention processes. *Attention, Perception, & Psychophysics*, *80*(7), 1654–1659. https://doi.org/10.3758/s13414-018-1590-z

Breil, C., Raettig, T., Pittig, R., van der Wel, R. P. R. D., Welsh, T., & Böckler, A. (2022). Don't look at me like that: Integration of gaze direction and facial expression. *Journal of Experimental Psychology: Human Perception and Performance*, *48*(10), 1083–1098. https://doi.org/10.1037/xhp0001046

Briton, N. J., & Hall, J. A. (1995). Beliefs about female and male nonverbal communication. *Sex Roles: A Journal of Research*, *32*(1–2), 79–90. https://doi.org/10.1007/BF01544758

Brody, L. R., & Hall, J. A. (2000). Gender, emotion, and expression. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions: Part IV: Social/personality issues* (2nd ed., pp. 325–414). Guilford Press.

Conty, L., George, N., & Hietanen, J. K. (2016). Watching Eyes effects: When others meet the self. *Consciousness and Cognition: An International Journal*, *45*, 184–197. https://doi.org/10.1016/j.concog.2016.08.016

Dores, A. R., Barbosa, F., Queirós, C., Carvalho, I. P., & Griffiths, M. D. (2020). Recognizing emotions through facial expressions: A largescale experimental study. *International Journal of Environmental Research and Public Health*, *17*(20), Article 7420. https://doi.org/10.3390/ijerph17207420

Eastwood, J. D., Smilek, D., & Merikle, P. M. (2003). Negative facial expression captures attention and disrupts performance. *Perception & Psychophysics*, *65*(3), 352–358. https://doi.org/10.3758/BF03194566

Fabes, R. A., & Martin, C. L. (1991). Gender and age stereotypes of emotionality. *Personality and Social Psychology Bulletin*, *17*(5), 532–540. https://doi.org/10.1177/0146167291175008

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/BF03193146

Freeman, J. B., Johnson, K. L., Ambady, N., & Rule, N. O. (2010). Sexual orientation perception involves gendered facial cues. *Personality and Social Psychology Bulletin*, *36*(10), 1318–1331. https://doi.org/10.1177/0146167210378755

Gallagher, N. M., & Bodenhausen, G. V. (2021). Gender essentialism and the mental representation of transgender women and men: A multimethod investigation of stereotype content. *Cognition*, *217*, Article 104887. https://doi.org/10.1016/j.cognition.2021.104887

Ganel, T., Goshen-Gottstein, Y., & Goodale, M. A. (2005). Interactions between the processing of gaze direction and facial expression. *Vision Research*, *45*(9), 1191–1200. https://doi.org/10.1016/j.visres.2004.06.025

Graham, R., & LaBar, K. S. (2007). Garner interference reveals dependencies between emotional expression and gaze in face perception. *Emotion*, *7*(2), 296–313. https://doi.org/10.1037/1528-3542.7.2.296

Graham, R., & LaBar, K. S. (2012). Neurocognitive mechanisms of gaze-expression interactions in face processing and social attention. *Neuropsychologia*, *50*(5), 553–566. https://doi.org/10.1016/j.neuropsychologia.2012.01.019

Hansen, C. H., & Hansen, R. D. (1988). Finding the face in the crowd: An anger superiority effect. *Journal of Personality and Social Psychology*, *54*(6), 917–924. https://doi.org/10.1037/0022-3514.54.6.917

Hehman, E., Sutherland, C. A. M., Flake, J. K., & Slepian, M. L. (2017). The unique contributions of perceiver and target characteristics in person perception. *Journal of Personality and Social Psychology*, *113*(4), 513–529. https://doi.org/10.1037/pspa0000090

Hess, U., Adams, R. B., Jr., & Kleck, R. E. (2004). Facial appearance, gender, and emotion expression. *Emotion*, *4*(4), 378–388. https://doi.org/10.1037/1528-3542.4.4.378

Hood, B. M., Macrae, C. N., Cole-Davies, V., & Dias, M. (2003). Eye remember you: The effects of gaze direction on face recognition in children and adults. *Developmental Science*, *6*(1), 67–71. https://doi.org/10.1111/1467-7687.00256

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). Guilford Press.

Langner, O., Dotsch, R., Bijlstra, G., Wigboldus, D. H. J., Hawk, S. T., & van Knippenberg, A. (2010). Presentation and validation of the Radboud Faces Database. *Cognition and Emotion*, *24*(8), 1377–1388. https://doi.org/10.1080/02699930903485076

Mathers, L. A. B. (2017). Bathrooms, boundaries, and emotional burdens: Cisgendering interactions through the interpretation of transgender experience. *Symbolic Interaction*, *40*(3), 295–316. https://doi.org/10.1002/symb.295

McCrackin, S. D., & Itier, R. J. (2019). Perceived gaze direction differentially affects discrimination of facial emotion, attention and gender—An ERP study. *Frontiers in Neuroscience*, *13*, Article 517. https://doi.org/10.3389/fnins.2019.00517

Ohlsen, G., van Zoest, W., & van Vugt, M. (2013). Gender and facial dominance in gaze cuing: Emotional context matters in the eyes that we follow. *PLOS ONE*, *8*(4), Article e59471. https://doi.org/10.1371/journal.pone.0059471

Oswald, F., & Adams, R. B., Jr. (2023). Feminist social vision: Seeing through the lens of marginalized perceivers. *Personality and Social Psychology Review*, *27*(3), 332–356. https://doi.org/10.1177/10888683221126582

Pittig, R., van der Wel, R. P. R. D., Welsh, T. N., & Böckler, A. (2023). What's in a gaze, what's in a face?: The direct gaze effect can be modulated by emotion expression. *Emotion*, *23*(2), 400–411. https://doi.org/10.1037/emo0001076

Saito, A., Sato, W., & Yoshikawa, S. (2022). Rapid detection of neutral faces associated with emotional value. *Cognition and Emotion*, *36*(3), 546–559. https://doi.org/10.1080/02699931.2021.2017263

Sato, W., & Yoshikawa, S. (2010). Detection of emotional facial expressions and anti-expressions. *Visual Cognition*, *18*(3), 369–388. https://doi.org/10.1080/13506280902767763

Schudson, Z. C., & van Anders, S. M. (2022). Gender/sex diversity beliefs: Scale construction, validation, and links to prejudice. *Group Processes & Intergroup Relations*, *25*(4), 1011–1036. https://doi.org/10.1177/1368430220987595

Senju, A., & Johnson, M. H. (2009). The eye contact effect: Mechanisms and development. *Trends in Cognitive Sciences*, *13*(3), 127–134. https://doi.org/10.1016/j.tics.2008.11.009

Shields, S. A. (2000). Thinking about gender, thinking about theory: Gender and emotional experience. In A. Fischer (Ed.), *Gender and emotion* (pp. 3–23). Cambridge University Press. https://doi.org/10.1017/CBO9780511628191.002

Skinner, A. L., & Benton, C. P. (2012). The expressions of strangers: Our identity-independent representation of facial expression. *Journal of Vision*, *12*(2), Article 12. https://doi.org/10.1167/12.2.12

Slepian, M. L., Weisbuch, M., Adams, R. B., & Ambady, N. (2011). Gender moderates the relationship between emotion and perceived gaze. *Emotion*, *11*(6), 1439–1444. https://doi.org/10.1037/a0026163

Tskhay, K. O., & Rule, N. O. (2015). Emotions facilitate the communication of ambiguous group memberships. *Emotion*, *15*(6), 812–826. https://doi.org/10.1037/emo0000077

van der Wel, R. (2023, September 18). *Face processing, emotion, gaze, gender, and gender ID*. https://osf.io/x4hu9

van der Wel, R. P., Welsh, T., & Böckler, A. (2018). Talking heads or talking eyes? Effects of head orientation and sudden onset gaze cues on attention capture. *Attention, Perception, & Psychophysics*, *80*(1), 1–6. https://doi.org/10.3758/s13414-017-1462-y

von Grünau, M., & Anston, C. (1995). The detection of gaze direction: A stare-in-the-crowd effect. *Perception*, *24*(11), 1297–1313. https://doi.org/10.1068/p241297

Wells, L. J., Gillespie, S. M., & Rotshtein, P. (2016). Identification of emotional facial expressions: Effects of expression, intensity, and sex on eye gaze. *PLOS ONE*, *11*(12), Article e0168307. https://doi.org/10.1371/journal.pone.0168307

(*Appendix follows*)

Appendix

Questionnaire

Circle Your Answers Below, on a Scale From 1 (*Strongly Disagree*) to 7 (*Strongly Agree*)

I see myself as someone who…

1.	Is original, comes up with new ideas	1	2	3	4	5
2.	Is curious about many different things	1	2	3	4	5
3.	Is ingenious, a deep thinker	1	2	3	4	5
4.	Has an active imagination	1	2	3	4	5
5.	Is inventive	1	2	3	4	5
6.	Values artistic, aesthetic experiences	1	2	3	4	5
7.	Prefers work that is routine	1	2	3	4	5
8.	Likes to reflect, play with ideas	1	2	3	4	5
9.	Has few artistic interests	1	2	3	4	5
10.	Is sophisticated in art, music, or literature	1	2	3	4	5

How Do You Identify in Terms of Your Gender? Please Choose One

- Cisgender man
- Transgender man
- Cisgender woman
- Transgender woman
- Nonbinary, genderqueer, gender fluid, pan gender, or agender

Circle Your Answers Below, on a Scale From 1 (*Strongly Disagree*) to 7 (*Strongly Agree*)

1.	There are many different gender identities people can have	1	2	3	4	5	6	7
2.	Nonbinary gender identities are valid	1	2	3	4	5	6	7
3.	A person's gender can change over time	1	2	3	4	5	6	7
4.	Being a woman or man has nothing to do with what genitals you have	1	2	3	4	5	6	7
5.	Transgender identities are natural	1	2	3	4	5	6	7
6.	Biological sex is not just female or male; there are many possibilities	1	2	3	4	5	6	7
7.	It is possible to have more than one gender identity at the same time	1	2	3	4	5	6	7
8.	It would be best if society stopped labeling people based on whether they are female or male	1	2	3	4	5	6	7
9.	Nonbinary gender identities have always existed	1	2	3	4	5	6	7
10.	The only thing that determines whether someone truly is a woman or a man is whether they identify as a woman or a man	1	2	3	4	5	6	7
11.	People who express their gender in ways that go against society's norms are just being their true selves	1	2	3	4	5	6	7
12.	Gender is about how you express yourself (e.g., how you dress or act)	1	2	3	4	5	6	7
13.	Transgender people were born the way they are	1	2	3	4	5	6	7
14.	Not all cultures have the same gender identities	1	2	3	4	5	6	7
15.	Men who behave in feminine ways are looking for attention	1	2	3	4	5	6	7
16.	A real man needs to be masculine	1	2	3	4	5	6	7
17.	People of the same gender tend to be similar to each other	1	2	3	4	5	6	7
18.	People of the same biological sex are mostly similar to each other	1	2	3	4	5	6	7
19.	Feminine people are similar to other feminine people, and masculine people are similar to other masculine people	1	2	3	4	5	6	7
20.	A person with a vagina can only ever be a man if they have surgery to have a penis instead	1	2	3	4	5	6	7
21.	A person with a penis can only ever be a woman if they have surgery to have a vagina instead	1	2	3	4	5	6	7
22.	Gender identity is affected by how a person is raised	1	2	3	4	5	6	7
23.	A person's experiences growing up determine whether they will be feminine or masculine	1	2	3	4	5	6	7

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