Everyday Beliefs About Emotion Perceptually Derived From Neutral Facial Appearance

Daniel N. Albohn* and Reginald B. Adams Jr. *

Department of Psychology, The Pennsylvania State University, University Park, PA, United States

The evolution of the human brain and visual system is widely believed to have been shaped by the need to process and make sense out of expressive information, particularly via the face. We are so attuned to expressive information in the face that it informs even stable trait inferences (e.g., Knutson, 1996) through a process we refer to here as the face-specific fundamental attribution error (Albohn et al., 2019). We even derive highly consistent beliefs about the emotional lives of others based on emotion-resembling facial appearance (e.g., low versus high brows, big versus small eyes, etc.) in faces we know are completely devoid of overt expression (i.e., emotion overgeneralization effect: see Zebrowitz et al., 2010). The present studies extend these insights to better understand lay beliefs about older and younger adults’ emotion dispositions and their impact on behavioral outcomes. In Study 1, we found that older versus younger faces objectively have more negative emotion-resembling cues in the face (using computer vision), and that raters likewise attribute more negative emotional dispositions to older versus younger adults based just on neutral facial appearance (see too Adams et al., 2016). In Study 2, we found that people appear to encode these negative emotional appearance cues in memory more so for older than younger adult faces. Finally, in Study 3 we exam downstream behavioral consequences of these negative attributions, showing that observers’ avoidance of older versus younger faces is mediated by emotion-resembling facial appearance.

Keywords: facial expression, person perception, neutral, neutral face, impression formation

INTRODUCTION

That humans possess theory of mind—the ability to read others to make accurate assessments of others’ seemingly invisible internal states—is widely hailed as evidence that the evolution of the human brain, and visual system in particular, has been shaped by a need to process and derive social meaning from others’ expression, particularly via the face (Allison et al., 2000; Emery, 2000).

As humans we are so tuned to reading expressive information from others that we fall prey to what we will refer to here as face-specific fundamental attribution errors (Albohn et al., 2019). Just like the classic fundamental attribution error, which posits that individuals tend to ascribe internal and stable traits based solely on external features, individuals tend to ascribe enduring personality traits and emotional dispositions to others based on their overt facial expressions...
We are so tuned to reading expressive information from the face that even when there is no expressive information present individuals base their beliefs about others’ emotional dispositions on emotion-resembling appearance cues in the face (i.e., emotion overgeneralization; Zebrowitz et al., 2010). Here we argue that the mechanism underlying emotion overgeneralization is a face-specific fundamental attribution error. That is, individuals overgeneralize emotions because they are using facial appearance cues that resemble expressions to make their judgments about enduring impressions of others.

Such appearance cues have been argued to contribute to various emotion stereotypes. For example, male faces (versus female faces) tend to structurally resemble anger expressions with lowered brows, thin lips, and square jaws, whereas female faces structurally resemble happy faces, in line with prevailing gender emotion stereotypes (see Adams et al., 2015 for review; Hess et al., 2004; Becker et al., 2007; Zebrowitz et al., 2010; Palumbo et al., 2017). Further, as a face ages, it takes on more emotion-resembling cues (Malatesta et al., 1987; Adams et al., 2016), which have been argued to contribute to negative age-related stereotypes (Hess et al., 2012).

A large meta-analytic review (Kite et al., 2005) and a study of 26 different cultures revealed strong evidence for negative age-related stereotypes (Löckenhoff et al., 2009). Critically, there is evidence that this bias is largely linked to impressions derived from faces. For instance, when asked to rate impressions of a “typical” younger and older person when not viewing faces, the typical negative bias disappeared (Boduroglu et al., 2006). This latter finding suggests a perceptual basis for age-related negative stereotypes, one we argue here is related to age-related emotion-resembling cues in the face. The most prevalent age-related stereotype is that older people are more prone to negative emotion than their younger counterparts, which arguably directly contributes to a general negativity bias (Fabes and Martin, 1991; Kite et al., 2005; Ebner, 2008).

THE CURRENT WORK

We first report a preliminary study to demonstrate lay beliefs about how informative neutral faces are to individuals. We hypothesized that participants would report that neutral faces offer little-to-no information when deriving emotional beliefs about others. We do this first to contrast with our subsequent studies in which we aimed to show that neutral faces are indeed utilized to form emotional impressions of others.

Next, in Study 1 we subjected all neutral faces to a computer vision analysis designed to read emotion from faces to establish objective evidence (from pixel and facial metric data) that there are more negative emotion cues in older versus younger faces. Then we had observers rate older and younger neutral faces on an emotion disposition profile to examine the influence of aging on everyday beliefs about emotions people report when rating faces. We predicted that there would be a bias to rate older faces as more likely to experience negative emotions, as prior work has suggested that aging cues in the face resemble negative emotions such as sadness and anger (e.g., Ebner, 2008; Hess et al., 2012), which we argue here in turn contributes to negative age-related stereotypes and bias.

Next, in Study 2 we examined people’s mental representations of older versus younger neutral faces to see if the images people hold in their memory of “typical” faces contain emotional tone. Assuming that people’s mental representations of older and younger faces reflect that which has been previously seen and stored in memory, we hypothesized that composites generated of older versus younger neutral faces, using a reverse correlation (RC) task (Dotsch et al., 2008), would be rated as higher on negative emotions by independent raters.

Finally, in Study 3 we examined the potential consequences of these negative age-related everyday beliefs about emotion on motivated behavior. Utilizing a modified approach/avoid task, we predicted that older faces would be avoided more than younger faces regardless of overt expression, and that older neutral faces would be avoided at a similar level as negative expressions due to emotion resemblance of age-related cues in the face. This latter prediction was tested using mediational analyses to show that age influences avoidance via emotion-resembling cues in the face.

PRELIMINARY STUDY: EVERYDAY BELIEFS ABOUT NEUTRAL DISPLAYS

Methods
Participants
Participants (N = 32; 22 females, 10 males, M_{age} = 18.78) were college students and received course credit in exchange for participation.

Stimuli and Procedure
Participants were asked “How socially informative is a/an (younger/older) (male/female) neutral face?” for a total of four trials per participant. Each statement was presented in random order across participants. Participants were allowed to type their response in a text box. At the beginning of the experiment they were asked to provide at least one sentence per question. After each free response, participants were asked the same question but asked to provide a numerical value on a Likert-type scale with anchors 1 = “Nothing at all” to 7 = “A lot.”

Results
Overall, across both older and younger adults the modal response on the “social informativeness” of a neutral face was two, suggesting that the majority of participants believed that neutral faces contained very little useful information for making judgments.1

Next, we conducted a two (gender: male, female) by two (age: old, young) linear mixed effects model to examine whether

---

1Modal response was two rather than one most likely due to scale extremity response bias (i.e., avoiding the very lowest or highest points of the scale).
participants’ ratings of neutral faces varied by age or gender. Our linear mixed effects model contained random intercepts for participants.

There was only a main effect of age, \( F(1, 96) = 6.60, p = 0.012 \). Overall, participants believed that older adult neutral faces were provided significantly less information than younger adult neutral faces (EMM = 3.73).

We also analyzed our open-ended data with a thematic analysis, which revealed results similar to our rating data. The full linear mixed model, along with additional thematic analysis, is provided in Supplementary Materials 1.

In sum, this pilot study suggests lay beliefs regarding neutral faces are that they are relatively uninformative, particularly older adult neutral faces. We present this data first because although everyday beliefs about neutral faces may be that they convey little information, in the subsequent studies we aim to demonstrate that they nonetheless contribute greatly to everyday beliefs about emotion, and of particular relevance to the current work, age-related beliefs.

**STUDY 1: DEMONSTRATION OF AGE-RELATED EMOTION OVERGENERALIZATION**

Study 1 was designed to demonstrate age-related emotion overgeneralization when making judgments of intentionally posed neutral faces. Specifically, we predicted that individuals would differentially attribute enduring emotional dispositions more so to older and younger adult neutral faces despite the lay belief that neutral faces provide little useful information.

**Methods**

**Participants and Stimuli**

Participants (\( N = 49; 39 \) females, 10 males, \( M_{\text{age}} = 19.2 \)) were college students. Stimuli were 888 older and younger adult neutral faces from the FACES image set (Ebner et al., 2010), the Face Database (Minear and Park, 2004), and the Humboldt image set (see, Adams et al., 2016) for a total of 394 old female adults, 209 old male adults, 144 young female adults, and 141 young male adults.

**Procedure**

Participants were instructed that they would be shown faces of individuals and asked to rate them on “how likely each individual is to feel the following emotions,” and then each emotion was listed in the following order: anger, joy, disgust, sadness, fear, and surprise. Next, individuals randomly saw 100 images from the image pool along with rating sliders for each of the six emotions. Each rating slider was anchored with points 1 = “Not at all,” 4 = “Somewhat,” and 7 = “Very much.”

**Results**

**FaceReader Results**

To first examine whether the observer rating results were driven by misconceptions of emotion cues in the aging neutral face, we analyzed each face utilizing FaceReader™ 6.1 (Noldus, 2015). FaceReader™ is a commercial computer vision tool used to objectively analyze the presence of expressions, action units, and emotional overall valence in facial images. FaceReader™ is well established and validated in the scientific literature, with results approaching expert level (Lewinski, 2015; Adams et al., 2016).

Each face was analyzed using FaceReader™ 6.1’s general model. As part of the general model, FaceReader™ outputs a valence score between \(-1\) and \(+1\) that corresponds to the amount of predicted negativity or positivity, respectively, present in each face. We analyzed each of the neutral faces’ valence score to compare whether older adult neutral faces were objectively categorized as more negative than younger adult neutral faces. Of the 888 faces, 878 face images were recognized and able to be computed with FaceReader™ detection algorithm. In line with our hypothesis, the valence of older adult neutral faces (EMM = \(-0.051\)) was more negative than younger adult neutral faces (EMM = \(0.000\)), \( F(1, 877) = 14.14, p < 0.001, R^2 = 0.02 \).
Additionally, we tested whether each images’ valence score mediated the relationship between image age and average participant rating score. FaceReader™ valence mediated this relationship for all emotion ratings except surprise and fear (all significant indirect effects $p's < 0.001$). The full linear mixed effects model, and mediation analyses are presented in Supplementary Materials 2.

In sum, Study 1 shows that participants derive beliefs about the emotional dispositions of younger and older adults based solely on their neutral faces. Overall more emotion is perceived in older faces, particularly more anger and disgust, presumably due to age-related appearance. That we found no difference in sadness and greater surprise for older adults, is perhaps due to the fact that we were using a very large, naturalistic data set of neutral faces. However, more overall affective negativity was detected by FaceReader™ based solely on objective facial cues, which in turn mediated participant responses, underscoring emotion resemblance as a primarily contributing influence in these everyday beliefs regarding age-related emotional dispositions.

**STUDY 2: BIAS IN MENTAL REPRESENTATIONS OF AGED FACES**

Study 2 was designed to examine how older and younger faces are encoded in memory. To do this we used a RC procedure (Dotsch et al., 2008) to generate composite images that reflect “mind’s eye” representations of a typical older versus younger adult. Study 1 demonstrated that older versus younger neutral faces objectively contain more negative emotion cues and are subjectively rated as expected to experience more negative emotions (particularly anger and disgust). Study 2 examined whether these age-related negative emotion-resembling appearance cues are also encoded into memory.

**Method**

**Participants**

Twenty-seven participants (16 females, 11 males) created RC classification images (CIs), and 66 participants$^2$ (46 females, 20 males) rated each image. Participants were college students that participated in exchange for course credit.

**Stimuli for this study were created following the typical RC procedure. Briefly, 300 image pairs were created by overlaying random sinusoidal noise or the inverse of the random noise pattern atop an age-ambiguous base image created by averaging old and young, male and female neutral faces from the Ebner face set (Ebner et al., 2010) together (see, Dotsch et al., 2008 for full RC method).

On each of the 300 trials, participants were asked to select between the image pairs the one that “looked most like a typical (older/younger) adult.” Participants completed this procedure for both age blocks (old/young), which were randomized between participants. Then, by aggregating participant responses across each trial and block, a meaningful representation of what the individual was imagining when thinking of the age group emerges from the random noise (see Figure 1 for examples). We collected 56 stimuli in this manner (27 participants $\times$ 2 blocks $+2$ aggregate images).

**Rating Procedure**

Participants were instructed that they would be shown faces that “had been manipulated using a computer program,” and to rate each face on several emotions/traits. Next, participants saw each of the 56 stimuli individually and asked to rate it on how angry, disgusting, fearful, feminine, happy, masculine, neutral, sad, and surprised it appeared before moving on to the next image. Images were randomized between participants. Each Likert-type scale was anchored with points 1 = “Not at all,” 4 = “Somewhat,” and 7 = “A lot.”

**Results**

We conducted a 2 (image age: older, younger) by 8 (rating: angry, disgusting, fearful, feminine, happy, masculine, neutral, sad, and surprised) linear mixed effects model with fixed effects for image age and emotion rating. We included random intercepts for each participant and image. Ratings of aggregate CIs are reported in Supplementary Materials 3.

There was a main effect for emotion rating, $F(8, 31338.2) = 731.043, p < 0.001$. Of note, CIs were rated highest for appearing neutral, and neutral ratings were significantly higher than all other emotion ratings. There was also a main effect for image age, $F(1, 52.1) = 18.99, p < 0.001$. On average, older adult CI images (EMM = 3.17) were rated higher than the younger adult CI images (EMM = 3.03), $t(31473) = 4.36, p < 0.001$.

There was also an interaction between emotion rating and image age, $F(8, 31338.2) = 92.07, p < 0.001$. Overall, older adult CIs were rated as expressing more anger, disgust, fear, sadness, and less happiness and neutrality than younger adult CIs (Table 2 reports full pairwise comparisons). The full linear mixed effects model is presented in Supplementary Materials 4.

In sum, Study 2 demonstrated that individuals hold internal representations of typical aged faces that contain more negative emotionality than younger faces. Because internal
representations for groups are largely the product of what has been experienced or seen before, these results suggest that the negativity “read into” aged faces are perceptually encoded.

**STUDY 3: CONSEQUENCES OF PERCEIVING EMOTIONAL NEGATIVITY IN OLDER NEUTRAL FACES**

Study 3 examines a potential consequence of perceiving older neutral faces as expressing negative affect. Specifically, we predicted that older adult neutral faces would be avoided to a greater extent than younger adult neutral faces, and that older adult neutral faces would be avoided in a manner similar to other negative emotions.

**Method**

**Participants and Stimuli**
Participants \(N = 52\); females = 19, males = 32, \(M_{\text{age}} = 19.26\) were college students.

Stimuli were 575 old and young adult emotional (angry, fear, joy, sad) and neutral faces from the FACES image set (Ebner et al., 2010) for a total of 174 old female adults, 150 old male adults, 174 young female adults, and 174 young male adults. We included expressive faces to compare neutral face responses to positive and negative expressive faces.

**Procedure**
Participants were instructed to imagine for each trial (face) that they were in a digital face-to-face meeting (e.g., Skype) with the individual presented. Participants were then told that for each trial they should use the mouse to place the individual presented at a distance that they felt comfortable interacting with that person. The experimental stimulus size was mapped to the participant's mouse movements such that pushing the mouse upward (away) made the image smaller, and thus appear as if it were further in the distance. Likewise, pulling the mouse downward (toward) made the image larger, and thus appear as if it were closer. Each trial started with the image presented focally but at a random distance (size). This procedure is a modified approach-avoid task whereby participants get stimulus-level feedback during each trial (see, Phaf et al., 2014). During each trial one of five random hallway backdrops appeared behind each image to add to the illusion of depth. Background images had no effect on the results, and thus were collapsed during analysis, \(F(4, 3860.5) = 1.18, p = 0.32\). In-between each mouse movement trial there was a 200 ms fixation dot. Participants completed 100 trials and randomly saw 100 images from the total pool of images. On average, participants saw approximately 5.2 \((SD = 0.26)\) images from each emotion by image gender by image age category.

**Results**
In order to fully explore the relationship between emotion, age, and approach/avoidant behavior, we first analyzed participant-level data for each age group and emotion expression. Following this, we analyzed the results at the stimulus-level using a mediation to examine the effect of each stimulus’ likelihood of expressing a given emotion on approach/avoidant behavior in relation to age of the stimulus itself.

**Avoidant Behavior**
We conducted a two (image age: old, young) by five (image emotion: angry, fear, happy, neutral, sad) linear mixed effects model with fixed effects for image age and image. We included random intercepts for each participant and image, and random slopes within image age group. The scale factor for the image (smaller values = stimuli placed farther away) was used as the dependent variable for all analyses.

There was a main effect for image emotion, \(F(4, 519.37) = 213.35, p < 0.001\). There was also a main effect of image age, \(F(1, 47.33) = 41.75, p < 0.001\), such that older adult images (EMM = 0.26) were placed further away compared to young adult images (EMM = 0.31), \(t(4200) = -6.46, p < 0.001\). There was also an image emotion by image age interaction, \(F(4, 519.16) = 3.39, p < 0.001\) (see **Figure 2**).

There was also an image emotion by image age interaction, \(F(4, 519.16) = 3.39, p < 0.001\). Post hoc analysis of this interaction revealed that across all emotion types older adults were placed farther away than younger adults, \(p's = 0.02–0.0001\). Of the five

**Table 2 |** Pairwise comparisons for Study 2.

| Rating | Older adult EMM | Younger adult EMM | Estimate | t-value | p-value |
|-------|-----------------|------------------|----------|---------|---------|
| Anger | 3.32            | 2.38             | 0.95     | 15.57   | <0.001  |
| Disgust | 3.16           | 2.54             | 0.62     | 10.32   | <0.001  |
| Fear  | 2.75            | 2.55             | 0.19     | 3.22    | 0.001   |
| Joy   | 1.92            | 2.75             | -0.83    | -13.80  | <0.001  |
| Sad   | 3.58            | 3.04             | 0.54     | 9.05    | <0.001  |
| Surprise | 2.02          | 2.11             | -0.09    | -1.51   | 0.132   |
| Neutral | 4.07           | 4.17             | -0.10    | -1.66   | 0.097   |
| Feminine | 3.71           | 3.70             | 0.01     | 0.16    | 0.873   |
| Masculine | 3.97           | 3.98             | -0.01    | -0.17   | 0.864   |

**FIGURE 2 |** Participant response means and 95% CIs for Study 3 approach/avoid mouse placement task. Y-axis represents relative size of the stimulus, with smaller values indicating the stimulus being placed further away. Placement values range from 1 (largest size) to 0 (smallest size).
emotions that participants saw, neutral faces showed the largest
difference between old (EMM = 0.25) and young (EMM = 0.33)
faces, t(4200) = −6.55, p < 0.001. Indeed, participants’ responses
to older adult neutral stimuli were significantly more similar
to negative emotion faces [r(40) = 0.86, p < 0.001] than they were
to positive emotion faces [r(40) = 0.38, p < 0.001],
z = 4.65, p < 0.001. Participant responses to young adult
neutral faces followed a similar pattern, with a higher correlation
with negative expressions [r(40) = 0.65, p < 0.001] than with
positive expressions [r(40) = 0.38, p = 0.012]. Critically, however,
the difference between these two similarity correlations only
approached significance, z = 1.84, p = 0.07. Additionally, when we
controlled for differences in approach/avoidant behavior between
old and young expressive faces, there was still a significant
difference between the distance participants placed older adult
neutral faces compared to younger adult neutral faces, F(1, 66.44) = 30.28,
p < 0.001.

Together, these results suggest that while there may be
a general negativity bias toward older adults, this bias
alone cannot fully explain the large differences observed for
placement of neutral faces. The full linear mixed effects
model and all of the pairwise comparisons are reported in
Supplementary Materials 5.

Stimulus-Level Characteristics
While our participant-level data suggests that there are nuanced
differences for older adult neutral faces, we wanted to further
examine the causal effects of stimulus-level characteristics on
approach/avoidance behavior. We computed a single negativity
index by taking the averaged emotion scores (positive emotions
reverse scores) provided by participants in Study 1 for each
image used in Study 3 and summing. We then conducted a
simple mediation to evaluate whether the negativity index
mediated the relationship between stimulus age (old versus
young) and distance participants placed the neutral face image
(approach/avoid behavior). In line with our hypothesis, greater
perceived negative emotional disposition on older adult neutral
faces mediated the relationship between stimulus age and placing
those faces further away. The standardized indirect effect was
0.04, and was significant with 10,000 bootstrapped samples, F(2, 112) = 31.34, p < 0.001, R² = 0.36, CIs [−0.1, 0.1] (see also
Supplementary Figure S1).

GENERAL DISCUSSION
Across three studies we presented data that shows the inherent
compulsion of observers to perceive more negative emotion
in non-expressive age-related appearance. In a preliminary
study we showed that participants believed that neutral faces
of all age groups provided little useful information, but in
particular older adult neutral faces. Despite this, in Study 1
when participants were presented with older and younger adult
neutral faces and asked to rate enduring emotion dispositions,
observers consistently reported that older adults were expected
to experience more negative emotions (e.g., anger, disgust)
and surprise. This is likely due to older adult neutral faces
containing more aging cues that can be misinterpreted as
emotion cues, which was underscored by an objective computer
vision approach also reading relatively more negative affect in
older versus younger neutral faces. This result conceptually
replicates previous research that has found a similar effect for
perceptually based negative, age-related stereotypes, while also
extending it to enduring emotion dispositions regarding age-
related, everyday beliefs about emotional experience (Hess et al.,
2012; Adams et al., 2016).

In Study 2 we found that participants also hold internal
mental representations of “typical” older neutral faces that—
although rated as appearing neutral—contain more negativity
than younger adult internal representations. Given evidence
in Study 1 that older faces objectively contain more negative
emotion-resembling cues than younger faces, Study 2 goes one
step further to show that these cues appear to be encoded into
memory becoming part of one’s facial aging prototype.

Lastly, in Study 3 we examined one potential consequence
that these everyday beliefs about age and perceived emotion
cues in a neutral face can have on real-world behavior. Utilizing
a modified approach/avoid task whereby the participant must
place an older or younger adult face either closer or further
away, participants consistently and across all emotions (including
neutral) placed older adults further away, suggesting a tendency
to avoid. Importantly, the largest of the observed effects was
for neutral faces, and overall emotional disposition negativity
mediated the relationship between stimulus age and the distance
at which neutral faces were placed.

It is important to note that despite our mediational evidence
showing that observers use negative emotion appearance to
make judgments of older adults’ neutral faces, there are likely
other contributing mechanisms at play as well. In particular, the
results may also be in part due to an in-group bias, or due to
some other characteristic about older adult neutral faces, such
as resemblance to anomalous faces or attractiveness. Indeed,
work has shown that both resemblance to anomalous faces and
attractiveness mediated the relationship between age and negative
traits (Zebrowitz et al., 2003; Palumbo et al., 2017). In our
studies, all of our participants were college-aged students rating
faces of younger and older adults. While it is certainly possible
that an in-group bias may be contributing to our observed
effects, our data suggest that negative emotion appearing cues
are a large contributor. Indeed, two mediation models show
that objective negative valence (Study 2) and perceived negative
emotion disposition (Study 3) mediate (negative) participant
responses to older adult faces.

In sum, we provide evidence that individuals ascribe
enduring emotion traits as a function of age based on
the physical appearance of an actor with a neutral visage.
Importantly, engaging in a face-specific fundamental attribution
error influences everyday beliefs about the emotional lives of
older versus younger adults, and in turn has real behavioral
consequences, such as a tendency to avoid actors that present
with neutral displays that contain more negative-appearing face cues.

That individuals are so tuned to extract any socially relevant
and useable information from even a non-expressive face
emphasizes just how important it is to understand what cues
observers utilize from the face to form beliefs about the individual, and the consequences that these beliefs have on real-world behavior (regardless of their accuracy). Indeed, the way in which we form everyday beliefs about an individual (via emotion cues) can have a profound impact on behavior, and in the case of aging, negative, avoidance-related consequences.

DATA AVAILABILITY STATEMENT
The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT
The studies involving human participants were reviewed and approved by the Office for Research Protections Pennsylvania State University. Written informed consent for participation was not required for this study in accordance with the National Legislation and the Institutional Requirements.

REFERENCES
Adams, R. B., Garrido, C. O., Albohn, D. N., Hess, U., and Kleck, R. E. (2016). What facial appearance reveals over time: when perceived expressions in neutral faces reveal stable emotion dispositions. Front. Psychol. 7:986. doi: 10.3389/fpsyg.2016.00986
Adams, R. B., Hess, U., and Kleck, R. E. (2015). The intersection of gender-related facial appearance and facial displays of emotion. Emot. Rev. 7, 5–13. doi: 10.1177/1754073914544407
Albohn, D. N., Brandenburg, J. C., and Adams, R. B. (2019). “Perceiving emotion in the “neutral” face: a powerful mechanism of person perception,” in The Social Nature of Emotion Expression, eds U. Hess, and S. Hareli (Berlin: Springer International Publishing), 25–47. doi: 10.1007/978-3-030-32968-6-3
Allison, T., Puce, A., and McCarthy, G. (2000). Social perception from visual cues: role of the STS region. Trends Cogn. Sci. 4, 267–278. doi: 10.1016/S1364-6613(00)01501-1
Becker, D. V., Kenrick, D. T., Neuberg, S. L., Blackwell, K. C., and Smith, D. M. (2007). The confounded nature of angry men and happy women. J. Pers. Soc. Psychol. 92, 179–190. doi: 10.1037/0022-3514.92.2.179
Boduroglu, A., Yoon, C., Luo, T., and Park, D. C. (2006). Age-related stereotypes: a comparison of american and chinese cultures. Gerontology 52, 324–333. doi: 10.1159/000094614
Dotsch, R., Wigboldus, D. H. J., Langner, O., and van Knippenberg, A. (2008). Ethnic out-group faces are biased in the prejudiced mind. Psychol. Sci. 19, 978–980. doi: 10.1111/j.1467-9280.2008.02186.x
Ebner, N. C. (2008). Age of face matters: age-group differences in ratings of young and old faces. Behav. Res. Methods 40, 130–136. doi: 10.3758/BRM.40.1.130
Ebner, N. C., Riediger, M., and Lindenerberger, U. (2010). FACES—a database of facial expressions in young, middle-aged, and older women and men: development and validation. Behav. Res. Methods 42, 351–362. doi: 10.3758/BRM.42.1.351
Emery, N. J. (2000). The eyes have it: the neuroethology, function and evolution of social gaze. Neurosci. Biobehav. Rev. 24, 581–604. doi: 10.1016/S0149-7634(00)00025-7
Fabes, R. A., and Martin, C. L. (1991). Gender and age stereotypes of emotionality. Pers. Soc. Psychol. Bull. 17, 532–540. doi: 10.1177/014616729175008
Hess, U., Adams, R. B., and Kleck, R. E. (2004). Facial appearance, gender, and emotion expression. Emotion 4, 378–388. doi: 10.1017/S1528-3474.4.4.378
Hess, U., Adams, R. B., Simard, A., Stevenson, M. T., and Kleck, R. E. (2012). Smiling and sad wrinkles: age-related changes in the face and the perception of emotions and intentions. J. Exp. Soc. Psychol. 48, 1377–1380. doi: 10.1016/j.jesp.2012.05.018
Hess, U., Blairy, S., and Kleck, R. E. (2000). The Influence of facial emotion displays, gender, and ethnicity on judgments of dominance and affiliation. J. Nonverb. Behav. 24, 265–283.

AUTHOR CONTRIBUTIONS
DA and RA contributed to the conception and design of the studies and contributed to writing, revising, and approving the manuscript. DA ran the studies and analyzed the data under the supervision of RA.

SUPPLEMENTARY MATERIAL
The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00264/full#supplementary-material

Kite, M. E., Stockdale, G. D., Whitley, B. E., and Johnson, B. (2005). Attitudes toward younger and older adults: an updated meta-analytic review. J. Soc. Issues 61, 241–266. doi: 10.1111/j.1540-4560.2005.00404.x
Knutson, B. (1996). Facial expressions of emotion influence interpersonal trait inferences. J. Nonverb. Behav. 20, 165–182. doi: 10.1007/BF02281954
Lewinski, P. (2015). Automated facial coding software outperforms people in recognizing neutral faces as neutral from standardized datasets. Front. Psychol. 6:1386. doi: 10.3389/fpsyg.2015.01386
Löckenhoff, C. E., De Fruyt, F., Terracciano, A., McCrae, R. R., De Bolle, M., Costa, P. T., et al. (2009). Perceptions of aging across 26 cultures and their culture-level associates. Psychol. Aging 24, 941–954. doi: 10.1037/a0016901
Malatesta, C. Z., Fiore, M. J., and Messina, J. J. (1987). Affect, personality, and facial expressive characteristics of older people. Psychol. Aging 2.6. doi: 10.1037/0882-7974.2.1.64
Minear, M., and Park, D. C. (2004). A lifespan database of adult facial stimuli. Behav. Res. Methods Instrum. Comput. 36, 630–633. doi: 10.3758/bf03206543
Noldus, (2015). FaceReader: Tool for Automated Analysis of Facial Expression: Version 6.1. Wageningen: Noldus Information Technology B.V.
Palumbo, R., Adams, R. B., Hess, U., Kleck, R. E., and Zebrowitz, L. (2017). Age and gender differences in facial attractiveness, but not emotion resemblance, contribute to age and gender stereotypes. Front. Psychol. 8:1704. doi: 10.3389/fpsyg.2017.01704
Phaf, R. H., Mohr, S. E., Rotteveel, M., and Wicherts, J. M. (2014). Approach, avoidance, and affect: a meta-analysis of approach-avoidance tendencies in manual reaction time tasks. Front. Psychol. 5:378. doi: 10.3389/fpsyg.2014.00378
Zebrowitz, L. A., Fellous, J.-M., Mignaut, A., and Andreoletti, C. (2003). Trait impressions as overgeneralized responses to adaptively significant facial qualities: evidence from connectionist modeling. Pers. Soc. Psychol. Rev. 7, 194–215. doi: 10.1207/S15327957PSPR0703-01
Zebrowitz, L. A., Kikuchi, M., and Fellous, J.-M. (2010). Facial resemblance to smiling and sad wrinkles: age-related changes in the face and the perception of social gaze. Neurosci. Biobehav. Rev. 34, 1181–1192. doi: 10.1016/j.neubiorev.2009.07.005
Zebrowitz, L. A., Kikuchi, M., and Fellous, J.-M. (2010). Facial resemblance to smiling and sad wrinkles: age-related changes in the face and the perception of social gaze. Neurosci. Biobehav. Rev. 34, 1181–1192. doi: 10.1016/j.neubiorev.2009.07.005
Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2020 Albohn and Adams. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.