

## BRIEF REPORT

# Emotion Perception Explains Age-Related Differences in the Perception of Social Gaffes

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Young (<36 years) and older (>59) adults viewed videos in which the same individual committed a faux pas, or acted appropriately, toward his coworkers. Older participants did not discriminate appropriate and inappropriate behaviors as well as young participants. Older participants also scored lower than young participants on an extensive battery of emotion recognition tests, and emotion performance fully mediated age differences in faux pas discrimination. The results provide further evidence for the role of emotion perception in a range of important social deficits.

**Keywords:** aging, faux pas, emotion recognition, social behavior

In a recent episode of a popular television drama, an elderly man interrupts a sensitive doctor–patient meeting to provide a stool sample. “Here’s my poop,” he says triumphantly as he drops a paper bag in front of the physician. Such depictions of the elderly as socially unaware are common comedic grist, yet if such stereotypes have any basis in fact, the implications are not funny, but tragic. The chronic inability to distinguish appropriate from inappropriate social behavior (faux pas), a deficit seen in children with Asperger syndrome and high-functioning autism (Baron-Cohen, O’Riordan, Stone, Jones, & Plaisted, 1999), as well as adults with damage to their orbitofrontal cortex (Stone, Baron-Cohen, & Knight, 1998), would likely be detrimental to social relationships and could ultimately contribute to the social isolation frequently reported in the oldest individuals (Cornwell & Waite, 2009). Understanding age-related changes in this ability can provide insight into the aging process and prescriptions for improving quality of life.

Although the term *faux pas* describes a range of social gaffes, Baron-Cohen et al. (1999) offer a useful and inclusive definition: “when a speaker says something without considering if it is something that the listener might not want to hear or know, and which typically has negative consequences that the speaker never intended” (p. 408). It follows, then, that one way to determine whether a statement is a faux pas is to assess its “negative consequences,” that is, its emotional impact on the listener. Older adults experience specific and reliable difficulties on tasks measuring emotion recognition. A recent meta-analysis of 17 studies (Ruffman, Henry, Livingstone, & Phillips, 2008) found that older adults were worse than young adults at identifying facial expressions of anger, sadness, fear, and to a lesser extent, happiness and surprise.

This analysis also reviewed the more limited data on other modes of emotion communication, such as auditory or bodily expressions, which are consistent with broad and general changes in emotion recognition skills.

The current study examined young and older adults’ ability to distinguish appropriate behavior from faux pas, and to test for the role of emotion recognition in any age-related differences. Only two studies have explicitly examined faux pas understanding in older adults (MacPherson, Phillips, & Della Sala, 2002; Wang & Su, 2006), each using written scenarios. Although both suggested that faux pas understanding changes with age, neither was able (or designed) to examine emotion recognition as a mechanism of the effect. In the current study, young and older participants viewed social interactions that, unlike written scenarios, provide most of the facial, bodily, and vocal cues that would be present in a real social situation. In addition, all participants completed an extensive battery of emotion recognition tasks that assessed their ability to detect and associate those cues. We predicted age differences on both the faux pas and emotion tasks and, more important, that emotion recognition abilities would mediate faux pas discrimination.

## Method

### Participants

The participants were 60 young adults (26 men, 34 women,  $M = 20.5$  years, range = 18 to 35) recruited through a campus job placement office and 61 older adults (25 men, 36 women,  $M = 70.5$  years, range = 60 to 85) recruited through a university participant database. All participants were native English speakers, were stroke-free, and had normal or corrected-to-normal vision. All participants were reimbursed \$25 to cover their travel expenses.

### Experimental Tasks

Participants volunteered for a study on “social understanding,” which involved both the faux pas discrimination task, as well as a

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battery of emotion recognition tasks. The latter are the subject of a separate report and, for the present purposes, are described in summary form below (for a full description, see Ruffman, Halberstadt, & Murray, 2009).

**Faux pas discrimination.** Stimuli were 16 video clips selected from the British situation comedy *The Office* featuring a group of people who work in the paper industry. In half of the clips, David, the boss of the office, acts in a socially inappropriate way toward his employees, such as by announcing his own promotion seconds after the employees find out that their own jobs are in jeopardy. In the remaining clips, David acts in a socially appropriate way with his employees.

The social appropriateness of David's behavior was established in a pretest in which an independent sample of 20 young and 20 older adults judged a larger set of 16 faux pas and 16 control clips. They were shown a photograph of David and informed that he would be "saying and/or doing things that are socially inappropriate" in some of the clips. Participants were instructed to rate the appropriateness of his behavior in each clip on an 11-point scale, ranging from 0% (*not socially appropriate at all*) to 100% (*entirely socially appropriate*). They recorded their ratings on an answer sheet, pressing the space bar at their own pace to advance to the next clip. The same procedure and dependent measure were used in the main study.

To reduce age bias in stimulus selection, and to eliminate stimuli unrepresentative of their category, we collapsed across young and older participants and eliminated the four easiest and four most difficult items in each stimulus group (i.e., the faux pas rated most inappropriate and control behaviors rated least inappropriate). The remaining appropriate and inappropriate clips chosen for the experiment differed significantly in the rated appropriateness of David's behavior and were matched for mean length and range (7 to 52 s).

**Emotion recognition tasks.** Participants were asked to identify three types of emotional expressions (facial, vocal, and bodily) and, in separate tasks, to match emotional expressions cross-modally (voices to faces and voices to bodies). Stimuli consisted of 24 faces, 24 voices (12 items repeated twice), and 24 bodies, in each case with four items representing each of six basic emotions (happy, sad, angry, fearful, disgusted, and surprised). Faces were a subset of the Facial Expressions of Emotion (Young, Perrett, Calder, Sprengelmeyer, & Ekman, 2002), which includes black-and-white images of five men and five women expressing each of the six emotions. Vocal expressions included items used by Sullivan and Ruffman (2004), supplemented by additional stimuli from Ruffman et al. (2009), in which actors made nonverbal emotional sounds (e.g., "grrrrr" for anger) or read neutral passages with emotional intonation. The bodily expressions were color pictures of actors, with their faces not visible or digitally obscured, conveying each of the basic emotions through various poses (e.g., for disgust, a woman recoiling from a man who is trying to kiss her). The test stimuli were chosen in a pretest ( $N = 40$ ) in which young and older participants were equally represented, and in which the easiest and most difficult items were eliminated, as described above.

In the emotion recognition tasks, the face, voice, and body items were randomly presented in three separate blocks by computer. In each case, participants chose the emotion that an expression conveyed, recording their response on an answer sheet. In the voice-

face matching task, participants listened to each emotional sound for 10 s and then selected which of six displayed faces (one for each of the six basic emotion categories) was expressing the same emotion. Each stimulus face served as the correct answer once and as a distracter five times across the 24 trials, randomly determined. The voice-body matching task was conducted similarly using the 24 bodies from the body task.

**General cognitive ability.** Fluid IQ was assessed using the first two subtests of the Culture Fair IQ Test (Cattell & Cattell, 1959). Crystallized IQ was tested on the Peabody Picture Vocabulary Test (Dunn & Dunn, 2007), a measure of receptive vocabulary requiring participants to point to one of four pictures to identify a word. Both were administered on paper.

## Procedure

The faux pas and emotion tasks and two IQ tests were presented in random order, followed by a vision test (The Snellen 3 Meter Visual Acuity Chart). Tasks were administered (for older adults) over two experimental sessions or (for young adults) one extended session of approximately 2 hr.

## Results

### Faux Pas Discrimination

Appropriateness ratings were submitted to a 2 (behavior type: control vs. inappropriate)  $\times$  2 (age group)  $\times$  2 (participant gender) mixed-model analysis of variance (ANOVA), with the first factor treated as a repeated measure. Consistent with pretest data, a main effect of behavior type,  $F(1, 117) = 667.01, p < .001, \eta_p^2 = .85$ , indicated that control behaviors were rated as more appropriate than faux pas, ( $M = 63.28, SE = 1.35$ , vs.  $M = 24.21, SE = 1.47$ ). However, the effect was qualified by an interaction with age group,  $F(1, 117) = 21.18, p < .001, \eta_p^2 = .15$ . As seen in Figure 1, young adults better discriminated the two kinds of behaviors, rating control items as more appropriate,  $F(1, 117) = 14.19, p <$

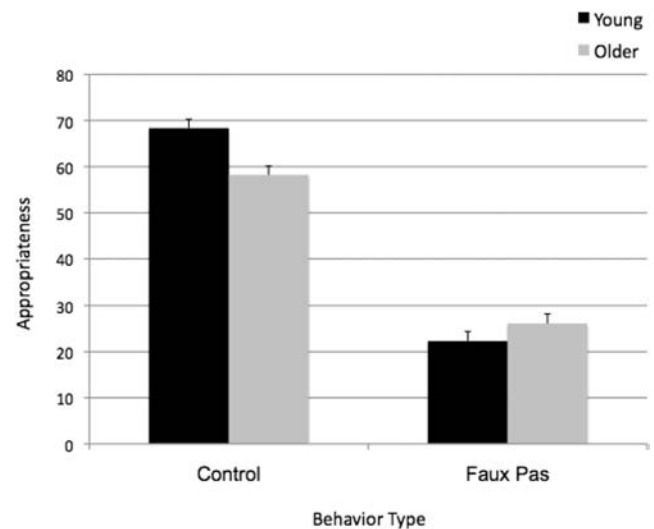


Figure 1. Appropriateness ratings of control and faux pas behaviors as a function of age group. Error bars represent standard errors of the means.

.001,  $\eta_p^2 = .11$ , and faux pas items as (nonsignificantly) less appropriate,  $F(1, 117) = 1.67, p < .20, \eta_p^2 = .01$ , compared with older adults. In addition, men rated the stimuli as more appropriate overall compared with women ( $M = 46.32, SE = 1.80$ , vs.  $M = 41.18, SE = 1.54$ ),  $F(1, 117) = 4.69, p < .05, \eta_p^2 = .04$ , but the effect did not interact with either age or behavior type.

## Emotion Perception

Emotion recognition scores, obtained by summing participants' correct responses across all subtasks (Cronbach's  $\alpha = .80$ ), were analyzed in a 2 (age group)  $\times$  2 (gender) ANOVA. Young participants ( $M = 96.29, SE = 1.52$ ) scored higher than older participants ( $M = 82.52, SE = 1.51$ ),  $F(1, 117) = 41.37, p < .001, \eta_p^2 = .26$ , and women ( $M = 92.72, SE = 1.39$ ) scored higher than men ( $M = 86.09, SE = 1.63$ ),  $F(1, 117) = 9.59, p < .005, \eta_p^2 = .08$ . The interaction was not significant,  $F < 1$ .

To examine the extent to which emotion accuracy could explain faux pas judgments, we first correlated emotion scores with appropriateness ratings for both control and faux pas items for young and older adults separately. These analyses revealed that emotion recognition predicted the appropriateness of faux pas in both young adults,  $r = -.28, p < .05$ , and older adults,  $r = -.42, p < .001$ . Emotion perception did not predict judgments of control items in either group ( $r_s = .11$  and  $.01, ns$ ). Correlations also indicated that control and faux pas ratings were related (young:  $r = .38, p < .005$ ; old:  $r = .45, p < .001$ ), suggesting that individuals differed in their overall judgments of appropriateness and making the selective correlation between emotion recognition and faux pas ratings that much more interesting.

To examine emotion recognition and ratings on faux pas items independent of these individual differences in responding, we used ratings of control behaviors, along with age group, to predict faux pas ratings in a multiple regression, with both predictors centered and entered simultaneously. The results, depicted in Figure 2, revealed an age effect,  $\beta = .25, p < .005$ , independent of ratings of control clips, such that young participants judged faux pas as less appropriate than older participants. Furthermore, when emotion score was added to the model, this variable strongly predicted faux pas perception,  $\beta = -.45, p < .001$ , and rendered the age effect nonsignificant,  $\beta = .03$ . A Sobel test confirmed that the reduction in the age effect was reliable,  $z = 3.86, p < .001$ , indicating full mediation of the age effect by emotion accuracy.

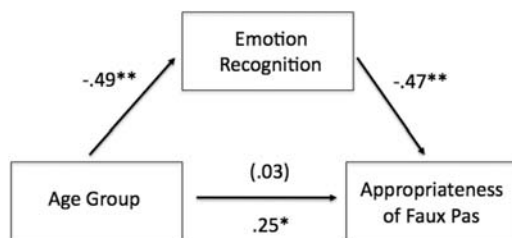


Figure 2. Regression model predicting the mediation of age-related change in faux pas perception by emotion recognition. All values are standardized regression weights and control for ratings of control scenarios. \*  $p < .01$ . \*\*  $p < .001$ .

## Individual Difference Measures

Consistent with previous research, analyses indicated that older participants scored higher on crystallized IQ than young participants,  $M_s = 19.79$  versus  $16.22, F(1, 117) = 34.79, p < .001$ , but lower on fluid IQ,  $M_s = 9.66$  versus  $15.03, F(1, 117) = 90.71, p < .001$ . In addition, young participants were more likely than older participants to have seen *The Office* (62% vs. 27%), although 20 older participants' data were missing on this measure. Including these variables as covariates in the analyses reported above did not change the nature of any results.

## Discussion

Faux pas represent a particularly important, subtle, and informative class of social behaviors. The current study represents the first attempt to examine age differences in the ability to distinguish faux pas from appropriate social behavior in dynamic social interactions, and to quantify the role of emotion recognition skills in any difficulties uncovered.

Indeed, older participants did not differentiate between appropriate and inappropriate behavior as well as young adults and judged David's faux pas as more appropriate than would be expected by their ratings of control scenarios, consistent with the two published findings on written faux pas (MacPherson et al., 2002; Wang & Su, 2006). Critically, the age differences in behavioral discrimination were fully explained by emotion recognition skills, demonstrated on our battery of emotion tests, to our knowledge the most comprehensive set of items currently available in the literature (Ruffman et al., 2009). Together, the findings are consistent with the hypothesis that age differences in faux pas performance are at least partially caused by age differences in emotion recognition. We caution, however, that such mechanistic conclusions are limited in cross-sectional studies (Hofer & Sliwinski, 2001), and we encourage a longitudinal replication of this work to more confidently identify the causal role of emotion.

Nevertheless, the link between emotion recognition and the identification of faux pas makes theoretical sense, as facial, bodily, and vocal expressions of emotion—the very information we assessed in our battery of emotion tests—are cues to a communicator's intentions, their awareness of their social gaffes, and the harm done to others. It should be noted, however, that such cues may not be necessary for the detection of faux pas; although emotional reactions of both the protagonist and his victims were available in our stimuli, even without this information, participants' general knowledge about social norms and likely emotional reactions may have been sufficient to judge the appropriateness of David's behavior.

Indeed, a number of researchers have argued for various conceptions of "emotional intelligence" (e.g., Ciarrochi, Chan, & Caputi, 2000; Izard et al., 2001; Salovey & Mayer, 1990; for review, see Mayer, Roberts, & Barsade, 2008) that include not only the ability to recognize emotions, but also to appraise, understand, and manage their meaning. If, as research suggests, these facets are empirically and functionally related (Mayer, Salovey, Caruso, & Sitarenios, 2001), older adults may show differences in faux pas detection regardless of whether others' emotional reactions are available. This result, which remains to be tested, would be consistent with findings relating emotion recognition with lie

detection (Stanley & Blanchard-Fields, 2008), effective negotiation (Elfenbein, Der Foo, White, Tan, & Aik, 2007), and employee performance (Elfenbein & Ambady, 2002). Future research should examine the role of emotional recognition in other critical social skills and the extent to which the detection of inappropriate behavior mediates these effects.

Finally, it would also be useful to examine the role of emotion recognition in the judgment of older adults' own social gaffes. Although not the subject of the current investigation, older adults are more prone to inappropriate behavior themselves, such as discussing embarrassing issues in public, which von Hippel and colleagues have linked to deficits in inhibitory abilities (Henry, von Hippel, & Baynes, 2009; von Hippel, 2007; von Hippel & Gonsalkorale, 2005). It may be that older adults' emotion deficits exacerbate their cognitive ones, making them less able to assess the appropriateness of their behavior, as well as less able to inhibit that behavior once recognized.

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