



## I care, even after the first impression: Facial appearance-based evaluations in healthcare context



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### ABSTRACT

**Purpose:** Prior research has demonstrated that healthcare providers' implicit biases may contribute to healthcare disparities. Independent research in social psychology indicates that facial appearance-based evaluations affect social behavior in a variety of domains, influencing political, legal, and economic decisions. Whether and to what extent these evaluations influence approach behavior in healthcare contexts warrants research attention. Here we investigate the impact of facial appearance-based evaluations of trustworthiness on healthcare providers' caring inclination, and the moderating role of experience and information about the social identity of the faces.

**Method:** Novice and expert nurses rated their inclination to provide care when viewing photos of trustworthy-, neutral-, and untrustworthy-looking faces. To explore whether information about the target of care influences caring inclination, some participants were told that they would view patients' faces while others received no information about the faces.

**Results:** Both novice and expert nurses had higher caring inclination scores for trustworthy-than for untrustworthy-looking faces; however, experts had higher scores than novices for untrustworthy-looking faces. Regardless of a face's trustworthiness level, experts had higher caring inclination scores for patients than for unidentified individuals, while novices showed no differences.

**Conclusions:** Facial appearance-based inferences can bias caring inclination in healthcare contexts. However, expert healthcare providers are less biased by these inferences and more sensitive to information about the target of care. These findings highlight the importance of promoting novice healthcare professionals' awareness of first impression biases.

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Daily social exchanges strongly rely on nonverbal cues, and faces are among the most salient nonverbal social stimuli (Zebrowitz, 2006; Farah et al., 1998). Faces rapidly yield information about identity, social category, and mental and emotional states. Even a glimpse of an unknown face is enough to infer a range of complex personality traits (e.g., trustworthiness, competence, and dominance). Though not necessarily accurate, such inferences affect behaviors and decisions (Todorov et al., 2015). For example, facial appearance-based inferences predict a variety of social outcomes

including electoral success (Sussman et al., 2013; Todorov et al., 2005), occupational success (Fruhen et al., 2015; Rule and Ambady, 2008), economic decisions (Tingley, 2014; Rezlescu et al., 2012; Van'tWout and Sanfey, 2008), and sentencing decisions and judgments of guilt (Wilson and Rule, 2015; Blair et al., 2004). Although people make a variety of inferences from faces, studies indicate that faces are automatically evaluated on valence, and that judgments of trustworthiness are the best approximation of this evaluation (Oosterhof and Todorov, 2008; Todorov et al., 2008; Sutherland et al., 2013).

It is yet to be explored whether inferences of trustworthiness based on facial appearance influence interactions between healthcare professionals and patients. Several factors are involved in healthcare provider–patient interactions, and initial appearance-based evaluation may be one of them. Investigating factors involved in healthcare provider–patient relationships is

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particularly important given that the quality of such relationships is a good predictor of the diagnostic accuracy of medical decisions (Makoul and Curry, 2007), doctors' job satisfaction and work-related stress (Mikesell, 2013; Maguire and Pitceathly, 2002), and patients' compliance and therapeutic outcomes (Benedetti, 2013; Zolnieriek and Dimatteo, 2009; Buckman, 2002). Health practitioners' implicit biases are one of the many factors involved in healthcare provider-patient interactions and can contribute to healthcare disparities (Clair et al., 2016; Burgess et al., 2004; van Ryn and Fu, 2003). Specifically, health practitioners' behavior and clinical decisions may be affected by their inferences from patients' characteristics, such as race (Cooper et al., 2012), age (Uncapher and Arean, 2000), body weight (Phelan et al., 2014), and gender (Borkhoff et al., 2008). For example, physicians' racial biases have been linked to disparities in communication quality (Cooper et al., 2012), clinical decision-making (Green et al., 2007; Dovidio et al., 2002), and the physician-patient talk time ratio during medical interactions (Hagiwara et al., 2013).

Here we investigate the influence of facial appearance-based inferences – specifically, inferences of trustworthiness – on nurses' caring inclination toward unknown individuals. As mentioned above, judgments of trustworthiness are the best approximation of general valence evaluation of faces. People make such judgments from facial appearance after less than 100 ms exposure to unfamiliar faces (Todorov et al., 2009, 2010). Data-driven computational models of these judgments show that they are based on subtle similarity to facial expressions and masculinity/femininity of the faces (Oosterhof and Todorov, 2008). Generally, feminine faces with positive expressions are evaluated more positively. These attributions of trustworthiness are highly correlated with approach/avoidance decisions (Adolphs et al., 1998; Todorov and Duchaine, 2008). The act of indicating concern for others, otherwise known as caring inclination, is known to be related to approach behavior. We expected that the apparent trustworthiness of faces would affect the caring inclinations of healthcare providers.

How facial appearance-based inferences influence social outcomes depends on a host of interpersonal and contextual factors (Todorov et al., 2015; Olivola et al., 2014; Johns and Shephard, 2011; Funk, 1997). Therefore, we further explored whether nurses' caring inclination is influenced by their professional experience and the availability of specific person information (patient vs. unidentified individual) about the depicted target of care. Because expertise affects the impact of facial appearance (Johns and Shephard, 2011; Funk, 1997), we predicted that experts would be less influenced by facial appearance than novices. Finally, given the influence of contextual information on facial appearance-based evaluations (Falvello et al., 2015; Mattarozzi et al., 2015; Todorov and Uleman, 2004), and given that prosocial behavior is increased by available information about the target of care (Genevsky et al., 2013), we predicted that caring inclination would be stronger toward individuals presented as "patients" than toward unidentified individuals. To the extent that experts are more likely to associate professional caring behavior with individuals identified as "patients", we expected that this effect would be stronger in experts than in novices.

## 1. Method

### 1.1. Participants

The novice group consisted of 96 freshmen students (19 men, 77 women, age range: 19–39 years,  $M = 21.96$ ;  $SD = 3.70$  years) recruited from the 110 students attending the first academic semester of Nurse Studies at the School of Medicine, University of Bologna, Italy. All nurse students attending the Cognitive

Psychology course were invited to voluntarily participate in a study on face perception and first impression. At the time of study participation, the freshmen nurse students had never had direct professional experience with patients.

The expert group consisted of 55 nurse practitioners with at least two years of professional experience (16 men, 39 women, age range: 24–62,  $M = 40.53$ ;  $SD = 9.44$  years; experience level: 2–38 years,  $M = 16.44$ ;  $SD = 9.70$ ) recruited from the emergency unit of the multi-campus University Hospital. We decided to recruit nurse practitioners working at the emergency unit because it is more likely that they have short interactions with patients and have to make rapid decisions. All participants were Caucasians.

Prior to participation in the study, all participants gave written informed consent. All participants were fully debriefed at the conclusion of the study. The experimental procedures were approved by the institutional review board (IRB) of the University of Bologna.

### 1.2. Stimuli

The stimuli were 36 photographs of Caucasian individuals from the Karolinska faces database (Lundqvist and Litton, 1998). The photographs were selected based on standardized average ( $z$  score) of their trustworthiness ratings collected in a previous study conducted by Oosterhof and Todorov (2008). Three sets of 12 photographs (6 male faces, 6 female faces) were used. Specifically, based on standardized average ( $z$  score), we selected the most trustworthy-looking faces ( $z = +0.74 \pm 0.22$ ), neutral faces ( $z = -0.02 \pm 0.11$ ), and the most untrustworthy-looking faces ( $z = -0.68 \pm 0.042$ ). One additional trustworthy female face (trustworthiness  $z$  scores: 1.35) was used for a practice trial. All photographs depicted individuals displaying direct gaze and neutral facial expression, but differing in perceived facial trustworthiness (see Fig. S1).

### 1.3. Caring inclination measure

For the development of the caring inclination measure, a psychologist and a research assistant conducted a focus group with 10 nurses working in emergency units who were not involved in the present study. Based on their experience, the nurses answered open-ended questions about what they considered as central aspects of caring professions. The focus group participants' answers were reworded and further discussed in the focus group to identify 10 questions comprising the Caring inclination measure (see Table S1). Of note, the responses to the questions were highly inter-correlated (internal consistency based on the sample from the subsequent study:  $\alpha = 0.93$ ), indicating that the questions likely measure the same construct. Participants in the study answered each question using a 9-point Likert scale (1 = "not at all" and 9 = "extremely"). The measure of caring inclination was computed by averaging the scores for all 10 questions (following inversion of reverse-keyed questions indicated by an asterisk in Table S1). Higher scores indicate higher caring inclination.

### 1.4. Procedure

All novices and experts were individually tested in dedicated quiet experimental rooms in the Nurse Department of the University Medical School and in the Emergency Unit, respectively.

Participants were seated in front of a computer monitor, instructed to view faces, and answer a set of related questions. E-Prime software (<http://www.pstnet.com/>) was used to present stimuli and record participants' responses. Faces were displayed at the center of the screen in a pseudorandom order for perceived

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