Abstract

While first impressions are often based on appearance cues, little is known about how these interact with information from other channels. The present research aimed to investigate the impact of occupational stereotypes, evoked by attire, as well as posture on person perception. For this, computer animation was used to create avatars with different types of attire (nurse, military, casual) and posture (open, closed). In Study 1 ($N = 164$), participants attributed significantly more empathy to avatars wearing a nurse versus a military uniform or casual outfit. When adding posture as an additional cue, Study 2 ($N = 312$) showed that ratings of empathy and dominance were affected by both attire and posture. This effect was replicated in Study 3 ($N = 163$) for female avatars in the sense that open postures in nurses increased empathy ratings and decreased dominance ratings, which both in turn led to greater perceived competence. By contrast, for male avatars, posture did not affect attributions of competence directly. Rather, attire predicted perceived dominance directly as well as through perceived empathy. The present findings suggest that both posture, and occupational information evoked by attire, are used to infer personal characteristics. However, the strength of each cue may vary with the gender of the target.

Keywords: occupational stereotypes, body posture, clothing, empathy, warmth, dominance; competence.

Introduction

People often and very rapidly form first impressions of others' personalities based on appearance cues only (Bar, Neta, & Linz, 2006). The research in this domain has mainly focused on facial cues and especially facial expressive cues (Hareli & Hess, 2010; Hess, Adams, & Kleck, 2009a; Todorov, 2008; Zebrowitz, 1996). Even though less attention has been devoted to other nonverbal channels such as posture, research on concepts related to verticality (dominance, power, prestige) has included body cues as well as gestures (Burgoon & Dunbar, 2006; Hall, Coats, & LeBeau, 2005). More recently, postures have been studied as signals of emotion (Aviezer et al., 2008; de Gelder, 2009) with associated attributions of power or prestige (e.g., Shariff, Tracy, & Markusoff, 2012).

While some of the research on person perception included context factors (e.g., Hess & Hareli, 2017), much of the research has used decontextualized facial and bodily stimuli or drawings (Rule, Adams Jr, Ambady, & Freeman, 2012). Yet, in everyday life people cannot be perceived without context. The very medium of any expressive behavior, be it facial, vocal or bodily carries information about the social group membership of the person and the stereotype knowledge associated with that group (Hess, Adams, & Kleck, 2009b). Aspects of personal grooming such as hairstyle, adornments and attire also provide stereotypical information about the wearer. Thornton (1943) already noted that a person wearing glasses was rated as more intelligent, dependable, industrious, and honest as the same person not wearing glasses, a finding that he attributed to the stereotype associated with wearing glasses. Yet, later research was mostly concerned with excluding or homogenizing factors such as glasses, jewelry, hair, clothing and similar nonverbal information.

The goal of the present research was to study person perception based on two neglected nonverbal channels, namely attire and posture. For this, avatars and facial blurring (Study 3) were used to control for facial appearance, and attire as well as posture (Studies 2 and 3) were varied.

Often, correct judgments of personality characteristics can be made based on very "thin slices" of behavior, that is, extremely short exposures to what may appear to be minimal information (Ambady, Hallahan, & Rosenthal, 1995; Ambady & Rosenthal, 1992), including static photos of only the eye region (Rule, Ambady, & Hallett, 2009). Much research has focused on facial appearance (Zebrowitz, 1997), as well as on physical attractiveness and the stereotype and halo effects that associate attractiveness with other desirable traits leading to the "what is beautiful is good" effect (Felson, 1979; Reis, Wilson, Monestere, & Bernstein, 1990). This approach is in line with the observation that, when presented with a complex scene including a person, people tend to focus on the face (Fletcher-Watson, Findlay, Leekam, & Benson, 2008).

However, early research also highlighted the information about personality transmitted by other channels. These include voice (e.g., Scherer, 1978) but also touch and posture (Burgoon, 1991; Mehrabian, 1969; Weisfeld & Beresford, 1982). Specifically, people associate certain postural cues with traits such as openness/affiliation or dominance versus submissiveness (Carney, Hall, & LeBeau, 2005). These cues can be gleaned rapidly (Rule et al., 2012) and tend to be processed automatically (Moors & De Houwer, 2005). In fact, similar associations can already be found in the classical roman literature (Newbold, 2000).

Importantly, people also transmit information about themselves through the way they present themselves to the outside world (Hess, 2015). Thus, the clothes that people wear can inform about preferences, but also and importantly are often associated with certain professions.

3

Uniforms are the most explicit means of signalling a profession. This allows for the influence of occupational stereotypes. While the role of such stereotypes is often discussed in relation to issues such as professional success, gender roles and self-esteem, less attention has been paid to the impact of professional stereotypes on person perception. Some early studies focused on person perception effects when occupying a gender-stereotypical versus -atypical profession (Etaugh & Stern, 1984; Shinar, 1978) but here the focus was very much on the gender stereotypes of that time. In addition, those studies often employed a vignette methodology, that is, they were not based on actual perceptual processes.

   As is the case for postures (Carney, Cuddy, & Yap, 2015), more recent research on the impact of clothing has focused on embodiment effects (Adam & Galinsky, 2012) rather than on person perception. Hence the present study aimed to return to the latter question using computer-generated, well controlled stimuli. In this research, we focused on the dimensions of warmth/empathy and dominance. Dominance and affiliation are behavioral dispositions that are of central importance to social beings (Leary, 1957). In hierarchical primate societies, highly dominant alpha individuals can pose a threat insofar as they may claim territory or possessions (e.g., food) from lower status group members (Menzel, 1973, 1974). Signaling high rank can also confer advantages such as increased social influence and attention (Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013), as well as submissive gaze aversion (Holland, Wolf, Looser, & Cuddy, 2017) but also increased attractiveness in a speed dating context (Vacharkulksemsuk et al., 2016). In contrast, affiliation is related to nurturing behaviors and should lead to approach when the other is perceived to be high on this behavioral disposition. Accordingly, it is crucial for social beings to assess the dominance and affiliation of others (Hess et al., 2009a).

The present research is comprised of three studies. In Study 1, the focus was on attire and perceived empathy only as we wished to establish that participants can attribute empathy to avatars as a function of attire. Specifically, the study confirmed that participants can assess "empathy" for an avatar and that manipulations of attire had the predicted effects. As attire we chose uniforms. Specifically, nurse and military uniforms. The reason for this choice was that these uniforms actually have a certain similarity in style - thus, aspects such as form fittedness and coverage are controlled – but very different associations. Stereotypical associations see nurses as high in interpersonal skills (Thurston, Chesson, Harris, & Ryan, 2017). Military uniforms carry a contrasting cultural message of aggression (cf. Spears & Smith, 2001). Thus, we predicted that individuals who are shown with a nurse uniform would be considered more affiliative, warm and empathic than those shown in a military uniform. Conversely, the latter should be perceived as more dominant.

These two dimensions were also tapped by the postures. We contrasted an open posture with arms stretched out in a welcoming gesture with a closed posture with arms crossed across the chest. An upright posture with arms crossed across the chest describes the upper body part of dominance expressions that can be detected even at very short presentation times (Rule et al., 2012). Open gestures with outstretched arms are perceived as dominant but also as warm (Vacharkulksemsuk et al., 2016). As we designed the gesture as an open greeting gesture we expected it to be perceived as warm and empathic. We opted for a design in which we successively added manipulations: Study 1 only focused on attire, Study 2 added posture, and in Study 3 we aimed to generalize from female avatars to male avatars.

Avatars have been frequently used in nonverbal communication research. Their specific advantage is that they allow control over facial morphology. When avatars are rendered over the

5

same underlying mesh, facial structures linked to dominance and affiliation (Hess et al., 2009a) as well as body shape can be kept constant. Further, expressive behavior can be precisely controlled to assure that all models show identical postures. Research on facial mimicry amongst others, shows that observers react to avatars in the same way as they react to humans (Maringer, Krumhuber, Fischer, & Niedenthal, 2011; Weyers, Mühlberger, Kund, Hess, & Pauli, 2009).

Study 1

The goal of the first study was to assess whether participants attribute different levels of empathy to an avatar as a function of attire (nurse versus military uniform, with a casual dress control condition).

Method

Participants. A power analysis with G*Power (Faul, Erfelder, Lang, & Buchner, 2007) indicated that 158 participants would be sufficient to detect a medium sized effect of attire (Cohen's $f = 0.25$) in a one-way ANOVA with 80% power. As we expected a 10-15% drop-out based on the control question probing for diligence, we oversampled accordingly in a single wave of data collection. One hundred seventy-eight participants were recruited online through a participant testing platform and took part in the study on a voluntary basis. To determine seriousness of participation, respondents indicated whether they actually wanted to take part in the experiment or just have a casual look at the pages (Reips, 2002). Fourteen participants chose this "merely look" option, leaving data from 164 respondents (116 women, $M = 25.8$ years, SD = 11) for analysis.

Stimulus Material. Five Caucasian female identities were digitally created in Poser Pro 2012 (Smith Micro, California, USA) using photorealistic textures, indirect light, and subsurface scattering. Variation in appearance between the Caucasian models was achieved through

6

differences in skin texture, eye, and hair color. Each identity was dressed in three different attires (nurse and military uniform, casual dress) and rendered in exactly the same neutral pose. 2D headshots of the characters showing the face, neck, and chest were displayed in color with an image size of 400 x 497 pixels.

Design and Procedure. Participants were randomly assigned to one of the 15 (5 identities x 3 attires) stimulus combinations in a between-subjects design. After giving informed consent, the following text-based description (adapted from Gray, Knobe, Sheshkin, Bloom, & Barrett, 2011) was provided together with a picture of the avatar: "This is Erin. She tries to do well in her job and takes it seriously. In her free time, she often does some sports. On weekends, Erin likes to hang out with friends." The description as well as the name were identical for all participants and stimulus combinations, and were displayed above the stimulus picture.

Participants were asked to evaluate on the basis of six items the degree of empathic ability of Erin. Each item took the form of a question starting with "Compared to an average person, how much is this person capable of X?", where "X" was replaced with the following six attributes: "taking another's perspective", "understanding the feelings of others", "showing compassion", "giving comfort", "sharing her feelings", and "being moved by the feelings of another person". Items were presented in the above order on 9-point Likert scales with response options ranging from 1 – *not at all* to 9 - *very much*. Upon completion of the experiment, participants were debriefed and thanked for their participation.

Results and Discussion

The six empathy-related items were combined into one scale, which had good internal consistency ($\alpha = 0.85$). Preliminary analyses showed that the effect of participant gender was non-significant, $U = 2.33$, $p = .102$. Hence, this variable was not considered for further analyses.

A 3 (attire) x 5 (identity) analysis of variance (ANOVA) on the overall empathy score did not reveal a significant main effect, $F(4, 149) = 0.93$, $p = .447$, $\eta_p^2 = .02$, or interaction $F(8, 149) = 1.55$, $p = .146$, $\eta_p^2 = .08$, as a function of identity. We therefore excluded this factor from statistical analysis henceforth.

As predicted, a significant main effect emerged for Attire, $F(2, 149) = 5.79$, $p = .004$, $\eta_p^2 = .07$. Post-hoc comparisons with Bonferroni correction indicated that the character was rated as more empathic when wearing a nurse ($M = 6.38$, $SD = 1.15$) versus a military uniform ($M = 5.61$, $SD = 1.33$, $p = .003$) or a casual attire ($M = 5.69$, $SD = 1.31$, $p = .006$). Even though the empathy ratings for the character in casual dress were intermediate to the two other conditions, the difference between the military uniform and the casual attire failed to reach significance ($p = .580$).

Study 1 provided evidence that participants attribute empathy to an avatar and that this attribution varies as a function of attire. We therefore proceeded to add posture as an additional factor and to include ratings of warmth and dominance to complete the design.

Study 2

Method

Participants. Three hundred thirty-nine participants were recruited online through a participant testing platform and took part in the study on a voluntary basis. Twenty-seven participants indicated a desire to "merely look" at the experiment, leaving data of 312 respondents (213 women, $M = 22.8$ years, $SD = 8.5$) for the analyses. Power to detect a small to medium sized (Cohen's $f = 0.16$) interaction effect in a 2 x 2 design exceeded 80%.

Material and Design. Four Caucasian female identities were digitally generated in Poser Pro 2012 (Smith Micro, California, USA) by varying the textures for the skin, hair, and eyes.

8

Expression and environmental lighting conditions were kept constant. Each identity was dressed in either a nurse or military uniform and rendered with either an open/welcoming or a closed posture, yielding a total of 16 (4 identities x 2 attires x 2 postures) conditions that were presented in a between-subjects design. 2D pictures of the identities providing a three-quarter view of the body were displayed in color with an image size of 400 x 497 pixels (see Figure 1A).

      Procedure. The study was conducted online using Unipark (©Questback). After giving informed consent, participants saw an image of the avatar and completed the 6-item empathy scale from Study 1. In addition, we included a 4-item scale on warmth and a 4–item scale on dominance, both of which were based on the Revised Interpersonal Adjectives Scales (IAS-R; Wiggins, Trapnell, & Phillips, 1988) and presented as questions in the following format: "Compared to the average person, how X is this person?" In place of the "X" were the *warmth* related items "gentlehearted", "tender", "cold-hearted" (r), and "unsympathetic" (r). For *dominance*, we selected the items "assertive", "dominant", "shy" (r), and "forceless" (r). All fourteen items were presented on 9-point Likert scales with response options ranging from 0 - *not at all* to 8 - *very much* for warmth and dominance, and 0 - *not capable at all* to 8 - *very capable* for empathy. Participants always started with the warmth and dominance scales for which the questions were presented in an alternating sequence. This was followed by the empathy scale with the same item sequence as in Study 1.

Results and Discussion

      A principal components analysis failed to find separate factors for warmth and empathy. Hence, the warmth items were merged into a new 10-item empathy scale ($\alpha = 0.92$). The four dominance items were combined into a global dominance scale ($\alpha = 0.73$). For both measures, mean values were computed by averaging across the four identities.

9

A 2 (attires) x 2 (postures) ANOVA revealed a significant main effect of Posture on empathy ratings, $F(1, 308) = 19.84$, $p < .001$, $\eta_p{}^2 = .06$, and dominance ratings, $F(1, 308) = 5.11$, $p = .024$, $\eta_p{}^2 = .02$. For dominance, only a significant main effect of Attire, $F(1, 308) = 5.67$, $p = .018$, $\eta_p{}^2 = .02$, emerged. For both empathy, $F(1, 308) = 10.27$, $p = .001$, $\eta_p{}^2 = .03$, and dominance, $F(1, 308) = 10.60$, $p = .001$, $\eta_p{}^2 = .03$, main effects were qualified by a significant Posture by Attire interaction.

As shown in Figure 1B, when the avatar showed an open pose, the nurse uniform led to higher empathy and lower dominance ratings than the military uniform. Within the nurse condition, the avatar was rated as higher in empathy and lower in dominance when rendered with an open rather than a closed pose. The main effect of attire on empathy was not significant, $F(1, 308) = 0.41$, $p = .524$, $\eta_p{}^2 = .00$.

These findings replicate those of the first study in the sense that a nurse uniform led to high empathy ratings with opposite effects for dominance ratings. However, this effect was moderated by posture such that the difference in ratings based on the occupational stereotype disappeared when a closed pose was shown. That is, occupational stereotypes can be overridden by negative nonverbal behavior. This finding may be an instantiation of the often observed effect that negative information is perceived as less diagnostic than positive information (Anderson, 1965; Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Notably, it is the more immediately relevant nonverbal behavior that overrides stereotypes based on stable occupational information and not vice versa.

Study 1 and 2 used only female avatars. This was done to simplify the design while establishing the relevance of the posture and attire manipulation to avatars. However, the occupations we focus on are gender-typical. The nursing profession is persistently depicted as

10

female in fiction and even textbooks and the female dominated view of nurses can pose problems for men in that profession (Hsu, Chen, Yu, & Lou, 2010; McLaughlin, Muldoon, & Moutray, 2010). Converse stereotypes exist for male versus female soldiers (Archer, 2013). In fact, research on professional choices shows that such stereotypes can translate into doubts regarding the competence of the non-gender stereotypical nurse (Hsu et al., 2010) or soldier (King, 2016).

Perceptual processes are also impacted by the gender congruency of a person's occupation. For example, participants who were asked to categorize the sex of individuals shown in gender-congruent versus -incongruent occupations showed increased activity in cortical areas associated with person perception and the resolution of conflicting information (Quadflieg et al., 2011). Thus, an important question relates to the degree to which the gender stereotypicality of an occupation affects ratings of dominance and empathy as a function of posture. We further wanted to assess whether such perceptions of dominance and empathy mediate a job relevant assessment, namely perceived competence.

Study 3

Method

Participants. One hundred and sixty-eight participants were recruited online through a participant testing platform and took part in the study on a voluntary basis. Five participants (with incomplete data or a study duration < 5 min) were dropped during data pre-processing, leaving 163 participants for the analysis (96 women, 4 'other' gender; $M = 28.5$, $SD = 9.5$). Power to detect a small sized (Cohen's $f = 0.10$) interaction effect in a 3 x 2 x 2 design exceeded 90%.

Stimulus Material. Four new Caucasian identities (2 male, 2 females) were digitally generated in Daz Studio Pro (V4.9, www.daz3d.com) and Luxrender (www.luxrender.net). Each

character was rendered with three attires (nurse versus military uniform, casual dress) and two

postures (open versus closed), yielding a total of 12 male and 12 female stimuli. In order to rule

out gender-specific effects of facial appearance, which have been shown to affect perceptions of

dominance and affiliation (Becker, Kenrick, Neuberg, Blackwell, & Smith, 2007; Hess et al.,

2009a), the face area was blurred for all characters using a pixilation filter in Adobe Photoshop

(CS6). Full 2D pictures of the characters providing a three-quarter view of the body were

displayed in color with an image size of 820 x 853 pixels (see Figures 2A and 3A).

Design and Procedure. The mixed factorial design included attire and posture as within-

subject manipulations, and target gender as between-subjects factor. The study was conducted online

using Unipark (©Questback). After providing informed consent, participants were presented with

images of the stimulus targets, which they rated using single-item measures on three traits: empathy,

dominance, and competence. To reduce the number of ratings, short descriptions of each trait were

given which ~~included~~ listed the ~~single items~~ adjectives for empathy from Study 1 and for dominance

from Study 2. Competence was described as being skillful, knowledgeable, capable, and competent.

Presentation order of stimulus targets and trait ratings was randomized. All responses were made on

7-point Likert scales ranging from 1 – *not at all* to 7- *very much*.

Results and Discussion

Preliminary analyses did not reveal any significant effect of participant gender, $F < 2.04$,

$p > .06$. Hence, this variable was not considered in further analyses. A 3 (Attire) x 2 (Posture) x 2

(Target Gender) multivariate analysis of variance (MANOVA) was conducted on the three

dependent measures: empathy, dominance, and competence. Significant main effects emerged

for Posture, $F(3, 156) = 129.44$, $p < .001$, $\eta_p^2 = .71$, Target Gender, $F(3, 159) = 2.75$, $p = .045$,

$\eta_p^2 = .05$, and Attire, $F(6, 156) = 30.88$, $p < .001$, $\eta_p^2 = .54$. The latter two effects were qualified

by a significant Attire by Target Gender interaction, $F(6, 156) = 7.91$, $p < .001$, $\eta_p^2 = .23$. To decompose the significant interaction, subsequent univariate analyses were conducted separately for female and male targets.

Male Targets. For male avatars, significant main effects of Attire and Posture emerged for dominance, $F_{Attire} (2, 81) = 11.47$, $p < .001$, $\eta_p^2 = .22$; $F_{Posture} (1, 82) = 43.15$, $p < .001$, $\eta_p^2 = .35$, and empathy, $F_{Attire} (2, 81) = 52.35$, $p < .001$, $\eta_p^2 = .56$; $F_{Posture} (1, 82) = 184.70$, $p < .001$, $\eta_p^2 = .69$, such that open postures resulted in higher ratings of empathy and lower ratings of dominance. For competence, only the main effect of Attire was significant, $F(2, 81) = 62.26$, $p < .001$, $\eta_p^2 = .61$. None of the Posture by Attire interactions were significant ($Fs < .50$, $ps > .604$). As shown in Figure 3B, avatars with a nurse uniform were rated as higher in empathy than avatars with a military uniform or casual dress. By contrast, ratings of dominance were higher for the military uniform than the nurse uniform or the casual dress. Finally, the nurse uniform was associated with more competence than the military uniform, which in turn was associated with more competence than the casual dress.

MEMORE (V1.1; Montoya & Hayes, 2017) was used to assess indirect effects from posture to competence through dominance and empathy. Ninety-five percent confidence intervals were generated from 10,000 bootstrap samples. Neither the total effect of posture on competence (b = -.12, $p = .228$, $CI_{95\%} = -.31, .07$) nor the direct effect of posture on competence when controlling for dominance and empathy was significant ($\beta = -.00$, $p = .958$, $CI_{95\%} = -.32, .31$). Only the indirect path through dominance was significant (b = .31, $CI_{95\%} = -.43, -.16$) indicating that posture mediated perceived competence through dominance. Even though posture was significantly related to empathy, the indirect path through empathy to competence was not significant (b = .19, $CI_{95\%} = -.12, .46$). The full model is shown in Figure 4a.

13

Since in the ANOVA attire predicted competence for men, we added an exploratory mediation analysis with attire as independent variable. For this, we contrasted the nurse and the military uniform. The total effect of attire was significant (b = .66, p < .001, $CI_{95\%}$ = .39, .92), such that the nurse uniform was associated with more competence. The direct effect of attire on competence remained significant when empathy and dominance were controlled for (b = .41, p = .033, $CI_{95\%}$ = .03, .79). The indirect effect through empathy was also significant, (b = .27, $CI_{95\%}$ = .07, .52), indicating mediation, such that a nurse uniform was associated with more empathy and empathy in turn with more competence. By contrast, even though attire was significantly associated with dominance, the indirect path through dominance was not significant, (b = -.02, $CI_{95\%}$ = -.14, .11). For the full model see Figure 4b.

In sum, the effect of posture on competence was significantly mediated through the effect of posture on dominance. A closed posture led to higher perceived dominance, which in turn led to higher perceived competence. By contrast, the effect of attire was significantly mediated through the effect of attire on perceived empathy. A man in a nurse uniform was perceived as more empathic and higher empathy was associated with more perceived competence.

Female Targets. A significant main effect of Posture emerged for dominance, $F(1, 79) = 80.97$, $p < .001$, $\eta_p{}^2 = .51$, empathy, $F(1, 79) = 160.65$, $p < .001$, $\eta_p{}^2 = .67$, and competence, $F(1, 79) = 4.75$, $p = .032$, $\eta_p{}^2 = .06$. Specifically, avatars with an open posture were rated as less competent and dominant but more empathic. Further, a significant main effect of Attire emerged for dominance, $F(2, 78) = 6.35$, $p = .003$, $\eta_p{}^2 = .14$, and competence, $F(2, 78) = 25.77$, $p < .001$, $\eta_p{}^2 = .40$. Casual dress was associated with less competence than the two types of uniforms which did not differ. For dominance only, the main effect of Attire was qualified by a significant Attire by Posture interaction, $F(2, 78) = 6.26$, $p = .003$, $\eta_p{}^2 = .14$. As shown in Figure 2B, in the

14

open posture condition, the military uniform was associated with higher dominance ratings than the nurse uniform and casual dress, which did not differ. For the closed posture condition, the same pattern as for competence emerged, in that both uniforms were associated with higher ratings of dominance than the casual dress.

We then addressed the question of whether the effect of posture on perceived competence was mediated by ratings of dominance and empathy. To test for an indirect effect of posture on perceived competence, via empathy and dominance, we used *MEMORE*. The total effect of posture on competence was significant (b = .29, p = .032, CI$_{95\%}$ = .03; .56), such that a closed posture led to more perceived competence, yet, the direct effect of posture was not significant when empathy and dominance were included as mediators (b = .14, p = .523, CI$_{95\%}$ = .29; .56). The indirect paths through both dominance (b = .66, CI$_{95\%}$ = .41; .96) and empathy (b = -.50, CI$_{95\%}$ = -.18, .86) were significant, indicating mediation. Specifically, closed postures increased ratings of dominance and decreased ratings of empathy. In turn, both dominance and empathy led to increases in ratings of competence. Dominance, however, was a significantly stronger mediator than empathy, as revealed by a significant contrast between both mediators (CI$_{95\%}$ = 1.767, .655). By contrast, the mediation analysis with attire as independent variable did not reveal any significant paths. See Figures 4c and 4d for full models.

In sum, for women, we found that perceptions of dominance and empathy were affected by posture as was found in Study 2. However, even though a main effect of attire emerged for dominance it was qualified by the interaction with posture. Overall, as was the case in study 2, for women, the effects of attire were small.

Even though for competence a main effect of attire emerged, such that uniforms were seen as indicative of higher competence when compared to casual dress, the contrast between nurse uniform and military uniform was non-significant. This may be because the uniforms clearly indicate that the person is holding down a job successfully, something that is indeed indicative of competence. In this case, however, it is not the occupational stereotype per se that explains the effect, but rather the fact that the uniform provides information about the person's current occupational status, which in turn suggests a certain level of competence. This notion is further supported by the fact that for women, the effect of attire on competence was not mediated through perceptions of dominance and empathy.

A rather different picture emerged for men. First, even though posture had the same effects on perceptions of dominance and empathy as were found for women, posture did not affect perceptions of competence directly. The indirect effect through perceived dominance was significant, but the total effect was not. By contrast, for men attire was found to predict perceived dominance directly as well as mediated through perceived empathy.

General Discussion

The present research aimed to extend research on person perception by focusing on posture and attire as cues to dominance and affiliation as well as competence. Study 1 demonstrated that participants ascribe empathy to an avatar, and in the absence of nonverbal information, do so in line with occupational stereotypes. Studies 2 and 3 showed that both occupational stereotypes and posture affect person perceptions. However, in Studies 2 and 3, the effect of a female avatar's attire was generally small or qualified by posture. This was especially the case for perceptions of competence in Study 3. Perceived competence was significantly

16

mediated though the effect of posture on perceived dominance and affiliation. Further, the main effect of attire on competence in Study 3 was only significant for the contrast between either type of uniform and the casual dress. Wearing a uniform is indicative of the fact that one holds employment – which in turn is directly indicative of competence. Notably, the effect of attire was not mediated through perceptions of dominance and empathy, further suggesting that occupational stereotypes (which differ for nurse and military uniforms) did not drive perceptions of competence for women.

In sum, when both sources of information were available, participants based their perception of the female avatar more strongly on the more immediate – and individual - nonverbal behavior rather than on occupational stereotypes. It could be argued that it makes sense to prefer a cue that speaks to the expresser's mind rather than a cue that describes a whole group.

However, for male avatars a very different picture emerged. Both posture and attire affected ratings of dominance and affiliation, but posture only predicted competence through dominance such that a closed posture increased perceptions of dominance which in turn increased perceptions of competence, yet the total effect was not significant. By contrast, for male avatars, attire predicted competence both directly and as mediated through empathy such that nurse uniforms were associated with higher empathy which in turn was associated with higher competence. This is interesting as it suggests that when rating a man, participants relied more strongly on the occupational stereotype.

However, this conclusion may be hasty. It is noteworthy that for men both empathy and dominance were associated with ratings of competence but in different contexts. Dominance is

often linked to competence (Tiedens, 2001) but there is less evidence for links between competence and empathy. In fact, the very influential stereotype content model (Cuddy, Fiske, & Glick, 2008; Fiske, Cuddy, & Glick, 2007) places warmth and competence orthogonally. For male avatars, ratings of dominance were only associated with competence when the independent variable was posture. That is, in the presence of a nonverbal individuating cue, dominance predicted competence. Yet, in the context of attire – that is, the occupational stereotype, empathy was predictive. As such, the empathy rating in question was based on the information that the man wore a nurse uniform, that is, demonstrated a non-stereotypical job choice. It is possible that participants considered a man who choses this job to be especially empathic and also especially competent. As such, the occupational uniform can actually provide information about an individuating aspect of the person, namely a non-stereotypical job choice, which gives insight into the person's character.

Besides their theoretical contribution, these findings have important practical implications. Clothing has been frequently used as a cue when depicting occupational and gender groups (Glick, Wilk, & Perreault, 1995). While considerable attention has been devoted to identifying the style and color of nursing uniforms that create a professional and caring impression (e.g. Tolbert & Beilstein, 2010; Wocial et al., 2010), work on military uniforms has tended to prioritize the practical utility of fiber and fabric (e.g., Schutz, Cardello, & Winterhalter, 2005) rather than extending focus to the social implications of the uniform.

Future studies in this line of research might address all three factors (gender, attire, and posture) in more ecologically valid scenarios that allow for social interaction beyond the first impressions studied here. While this requires further methodological advancement, such work may help to understand under what conditions effects of occupational stereotypes are amplified,

18

and what type of nonverbal behavior (most) effectively provides individuating information. This might be of particular relevance in the context of long-term social relations, or contexts where the actual requirements of a situation run contrary to ingrained occupational or gender stereotypes.

The present research suggests that both posture and occupational information may be used by participants to infer personal characteristics of the target. The pattern of results suggests that, overall, participants rely more on proximal individuating information than on global stereotypes when that information is available in the form of a nonverbal cue or a counter-stereotypical job choice. When such information is not available, as in Study 1, occupational stereotypes are used.

References

Adam, H., & Galinsky, A. D. (2012). Enclothed cognition. *Journal of Experimental Social Psychology, 48*, 918-925. doi: 10.1016/j.jesp.2012.02.008

Ambady, N., Hallahan, M., & Rosenthal, R. (1995). On judging and being judged accurately in zero-acquaintance situations. *Journal of Personality and Social Psychology, 69*, 518-529. doi:10.1037/0022-3514.69.3.518

Ambady, N., & Rosenthal, R. (1992). Thin slices of expressive behavior as predictors of interpersonal consequences: A meta-analysis. *Psychological Bulletin, 111*, 256-274. doi: 10.1037/0033-2909.111.2.256

Anderson, N. H. (1965). Averaging versus adding as a stimulus-combination rule in impression formation. *Journal of Experimental Psychology, 70*, 394- 400, doi:10.1037/h0022280

Archer, E. M. (2013). The power of gendered stereotypes in the US Marine Corps. *Armed Forces & Society, 39*, 359-391. doi:10.1177/0095327X12446924

Aviezer, H., Hassin, R., Ryan, J., Grady, C., Susskind, J., Anderson, A., Moscovitch, M., & Bentin, S. (2008). Angry, Disgusted, or Afraid? Studies on the malleability of emotion perception. *Psychological Science, 19*, 724-732. doi: 10.1111/j.1467-9280.2008.02148.x.

Bar, M., Neta, M., & Linz, H. (2006). Very first impressions. *Emotion, 6*, 269–278. doi:10.1037/1528-3542.6.2.269

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*(4), 323-370. doi: 10.1037/1089-2680.5.4.323

Becker, D. V., Kenrick, D. T., Neuberg, S. L., Blackwell, K. C., & Smith, D. M. (2007). The confounded nature of angry men and happy women. *Journal of Personality and Social Psychology, 92*, 179-190. doi:10.1037/0022-3514.92.2.179

Burgoon, J. K. (1991). Relational message interpretations of touch, conversational distance, and posture. *Journal of Nonverbal Behavior, 15*, 233-259. doi: 10.1007/BF00986924

Burgoon, J. K., & Dunbar, N. E. (2006). Nonverbal expressions of dominance and power in human relationships. In S. Manusov & M. L. Patterson (Eds.), *The Sage handbook of nonverbal communication* (pp. 279-297). London, England: Sage Publications Inc.. doi:10.4135/9781412976152.n15

Carney, D. R., Cuddy, A. J., & Yap, A. J. (2015). Review and summary of research on the embodied effects of expansive (vs. contractive) nonverbal displays. *Psychological Science, 26*, 657-663. doi:10.1177/0956797614566855

Carney, D. R., Hall, J. A., & LeBeau, L. S. (2005). Beliefs about the nonverbal expression of social power. *Journal of Nonverbal Behavior, 29*, 105-123. doi:10.1007/s10919-005-2743-z

Cheng, J. T., Tracy, J. L., Foulsham, T., Kingstone, A., & Henrich, J. (2013). Two ways to the top: Evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *Journal of Personality and Social Psychology, 104*, 103-125. doi:10.1037/a0030398

Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. In P. Z. Mark (Ed.), *Advances in experimental social psychology* (Vol. 40, pp. 61-149). San Diego, United States: Academic Press. doi:10.1016/S0065-2601(07)00002-0

de Gelder, B. (2009). Why bodies? Twelve reasons for including bodily expressions in affective neuroscience. *Philosophical Transactions of the Royal Society London B, 364*, 3475–3484. doi:10.1098/rstb.2009.0190

Etaugh, C., & Stern, J. (1984). Person perception: Effects of sex, marital status, and sex-typed occupation. *Sex Roles, 11*, 413-424. doi:10.1007/BF00287469

Felson, R. B. (1979). "Are the good beautiful or the beautiful good?" The relationship between children's perception of ability and perceptions of physical attractiveness. *Social Psychology Quarterly., 42*, 386-392. doi:10.2307/3033808

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: warmth and competence. *Trends in Cognitive Sciences, 11*, 77-83. doi:10.1016/j.tics.2006.11.005

Fletcher-Watson, S., Findlay, J. M., Leekam, S. R., & Benson, V. (2008). Rapid detection of person information in a naturalistic scene. *Perception, 37*, 571-583. doi:10.1068/p5705

Glick, P., Wilk, K., & Perreault, M. (1995). Images of occupations: Components of gender and status in occupational stereotypes. *Sex Roles*, *32*, 565-582. doi:10.1007/BF01544212

Hall, J. A., Coats, E. J., & LeBeau, L. S. (2005). Nonverbal behavior and the vertical dimension of social relations: a meta-analysis. *Psychological Bulletin, 131*, 898-924. doi: 10.1037/0033-2909.131.6.898

Hareli, S., & Hess, U. (2010). What emotional reactions can tell us about the nature of others: An appraisal perspective on person perception. *Cognition and Emotion, 24*, 128-140. doi: 10.1080/02699930802613828

Hess, U. (2015). Nonverbal communication. In H. Friedman (Ed.), *Encyclopedia of mental health* (Vol. 2., pp. 119-138). San Diego, United States: Lawrence Erlbaum. doi:10.1016/B978-0-12-397045-9.00218-4

Hess, U., Adams, R. B., Jr., & Kleck, R. E. (2009a). The face is not an empty canvas: How facial expressions interact with facial appearance. *Philosophical Transactions of the Royal Society London B, 364*, 3497-3504. doi:10.1098/rstb.2009.0165.

Hess, U., Adams, R. B., Jr., & Kleck, R. E. (2009b). Inter-group misunderstandings in emotion communication. In S. Demoulin, J.-P. Leyens, & J. F. Dovidio (Eds.), *Intergroup misunderstandings: Impact of divergent social realities* (pp. 85-100). New York Psychology Press.

Hess, U., & Hareli, S. (2017). *The social signal value of emotions: The role of contextual factors in social inferences drawn from emotion displays.* Paper presented at the conference 'The science of facial expression'.

Holland, E., Wolf, E. B., Looser, C., & Cuddy, A. (2017). Visual attention to powerful postures: People avert their gaze from nonverbal dominance displays. *Journal of Experimental Social Psychology, 68*, 60-67. doi: 10.1016/j.jesp.2016.05.001

Hsu, H. Y., Chen, S. H., Yu, H. Y., & Lou, J. H. (2010). Job stress, achievement motivation and occupational burnout among male nurses. *Journal of advanced nursing, 66*, 1592-1601. doi:10.1111/j.1365-2648.2010.05323.x

King, A. (2016). The female combat soldier. *European Journal of International Relations, 22*, 122-143. doi:10.1177/1354066115581909

Maringer, M., Krumhuber, E., Fischer, A. H., & Niedenthal, P. M. (2011). Beyond smile dynamics: Mimicry and beliefs in judgments of smiles. *Emotion*, *11,* 181-187. doi: 10.1037/a0022596

McLaughlin, K., Muldoon, O. T., & Moutray, M. (2010). Gender, gender roles and completion of nursing education: A longitudinal study. *Nurse Education Today, 30*, 303-307. doi:10.1016/j.nedt.2009.08.005.

Mehrabian, A. (1969). Significance of posture and position in the communication of attitude and status relationships. *Psychological Bulletin, 71*, 359-372. doi:10.1037/h0027349

Moors, A., & De Houwer, J. (2005). Automatic processing of dominance and submissiveness. *Experimental Psychology (formerly" Zeitschrift für Experimentelle Psychologie"), 52*, 296-302. doi: 0.1027/1618-3169.52.4.296

Newbold, R. F. (2000). Non-verbal communication in Suetonius and the Historia Augusta : power, posture and proxemics. *Acta Classica : Proceedings of the Classical Association of South Africa, 43*, 101-118.

Quadflieg, S., Flannigan, N., Waiter, G. D., Rossion, B., Wig, G. S., Turk, D. J., & Macrae, C. N. (2011). Stereotype-based modulation of person perception. *NeuroImage, 57*, 549-557. doi:10.1016/j.neuroimage.2011.05.004

Reis, H. T., Wilson, I. M., Monestere, C., & Bernstein, S. (1990). What is smiling is beautiful and good. *European Journal of Social Psychology., 20*, 259-267. doi:10.1002/ejsp.2420200307

Rule, N. O., Adams Jr, R. B., Ambady, N., & Freeman, J. B. (2012). Perceptions of dominance following glimpses of faces and bodies. *Perception, 41*, 687-706. doi: 10.1068/p7023

Rule, N. O., Ambady, N., & Hallett, K. C. (2009). Female sexual orientation is perceived accurately, rapidly, and automatically from the face and its features. *Journal of Experimental Social Psychology, 45*, 1245-1251. doi: 10.1016/j.jesp.2009.07.010

Scherer, K. R. (1978). Personality inference from voice quality: The loud voice of extraversion. *European Journal of Social Psychology, 8*, 467-487. doi:10.1002/ejsp.2420080405

Schutz, H. G., Cardello, A. V, & Winterhalter, C. (2005). Perceptions of fiber and fabric uses and the factors contributing to military clothing comfort and satisfaction. *Textile Research Journal*, *75*, 223–232. doi:10.1177/0040517505075003 07

Shariff, A. F., Tracy, J. L., & Markusoff, J. L. (2012). (Implicitly) judging a book by its cover: The power of pride and shame expressions in shaping judgments of social status. *Personality and Social Psychology Bulletin, 38*, 1178-1193. doi:10.1177/0146167212446834.

Shinar, E. H. (1978). Person perception as a function of occupation and sex. *Sex Roles, 4*(5), 679-693. doi: 10.1007/BF00287332

Spears, R., & Smith, H. J. (2001). Experiments as Politics. *Political Psychology, 22*, 309-330. doi:10.1111/0162-895X.00241

Thornton, G. R. (1943). The effect upon judgements of personality traits of varying a single factor in a photograph. *Journal of Social Psychology, 18*, 127-148. doi:10.1080/00224545.1943.9921704

Thurston, M. M., Chesson, M. M., Harris, E. C., & Ryan, G. J. (2017). Professional stereotypes of interprofessional education naïve pharmacy and nursing students. *American Journal of Pharmaceutical Education, 81*, 84. doi:10.5688/ajpe81584

Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: The effect of negative emotion expressions on social status conferral. *Journal of Personality and Social Psychology, 80*, 86-94. doi:10.1037/0022-3514.80.1.86 ·

Todorov, A. (2008). Evaluating faces on trustworthiness: An extension of systems for recognition of emotions signaling approach/avoidance behaviors. *Annals of the New York Academy of Sciences, 1124*, 208-224. doi: 10.1196/annals.1440.012

Tolbert, C., & Beilstein, L. (2010). Nurses' attire: Choosing the right answer. *Nurse Leader*, *8*, 55-58. doi: 10.1016/j.mnl.2010.02.003

Vacharkulksemsuk, T., Reit, E., Khambatta, P., Eastwick, P. W., Finkel, E. J., & Carney, D. R. (2016). Dominant, open nonverbal displays are attractive at zero-acquaintance. *Proceedings of the National Academy of Sciences, 113*, 4009-4014. doi:10.1073/pnas.1508932113

Weisfeld, G. E., & Beresford, J. M. (1982). Erectness of posture as an indicator of dominance or success in humans. *Motivation and Emotion, 6*, 113-131. doi:10.1007/BF00992459

Weyers, P., Mühlberger, A., Kund, A., Hess, U., & Pauli, P. (2009). Modulation of facial reactions to avatar emotional faces by nonconscious competition priming. *Psychophysiology, 46*, 328-335. doi:10.1111/j.1469-8986.2008.00771.x

Wocial, L., Albert, N. M., Fettes, S., Birch, S., Howey, K., Jie, N., & Trochelman, K. (2010). Impact of pediatric nurses' uniforms on perceptions of nurse professionalism. *Pediatric Nursing*, *36*, 320–326. doi:10.1016/j.apnr.2007.04.008

Zebrowitz, L. A. (1996). Physical appearance as a basis for stereotyping. In M. H. N. McRae & C. Stangor (Eds.), *Foundation of stereotypes and stereotyping* (pp. 79–120). New York, NY: Guilford Press.

Zebrowitz, L. A. (1997). *Reading faces: Window to the soul?* Boulder, CO, US: Westview Press.
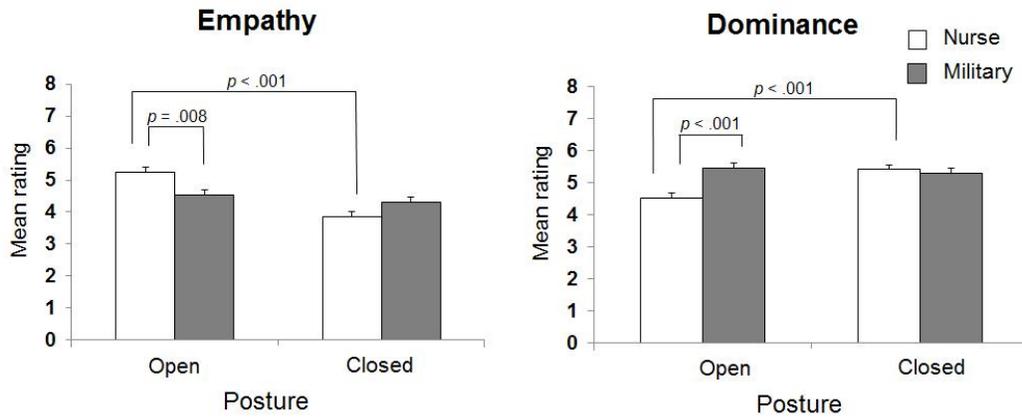
Figure 1. *A*. Example of a stimulus target with a nurse and military uniform in an open pose (left side) and closed pose (right side) used in Study 2. *B*. Mean ratings of empathy and dominance as a function of uniform (nurse vs. military) and posture (open vs. closed). Error bars represent standard errors of the mean.
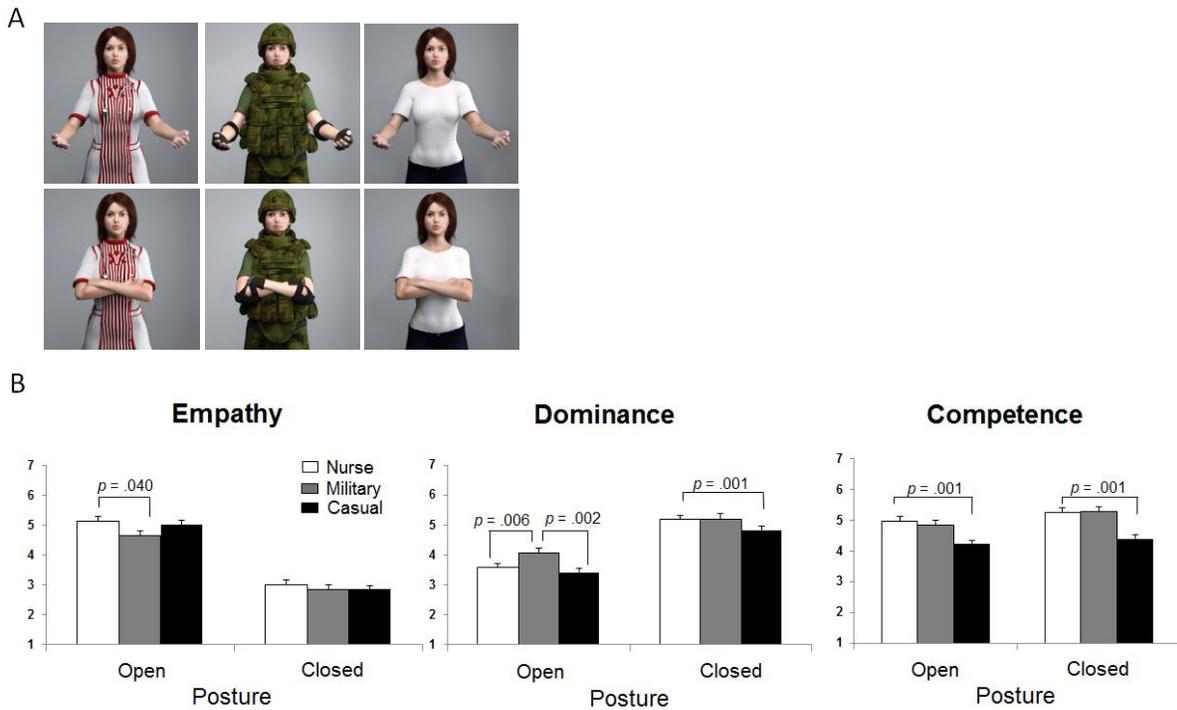
Figure 2. *A*. Example of a female stimulus target with a nurse or military uniform, and casual outfit in an open pose (top) and closed pose (bottom) as used in Study 3. *B*. Mean ratings of empathy, dominance and competence as a function of attire (nurse, military, casual) and posture (open vs. closed). Error bars represent standard errors of the mean.
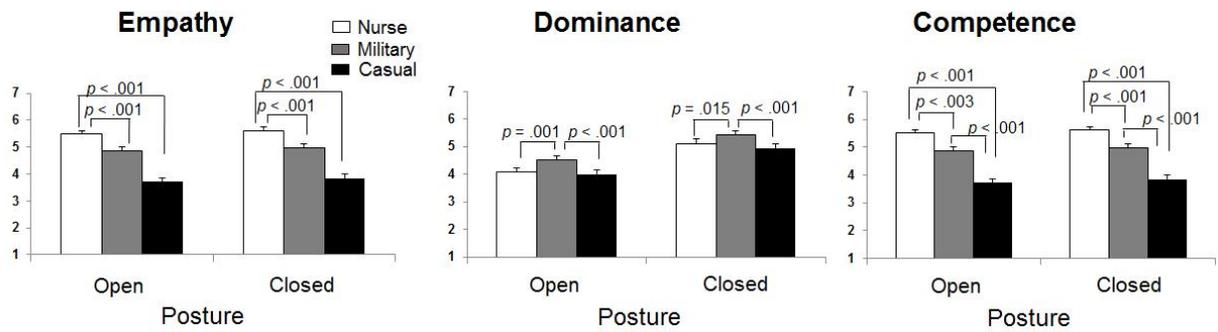
Figure 3. *A*. Example of a male stimulus target with a nurse or military uniform, and casual outfit in an open pose (top) and closed pose (bottom) as used in Study 3. *B*. Mean ratings of empathy, dominance and competence as a function of attire (nurse, military, casual) and posture (open vs. closed). Error bars represent standard errors of the mean.
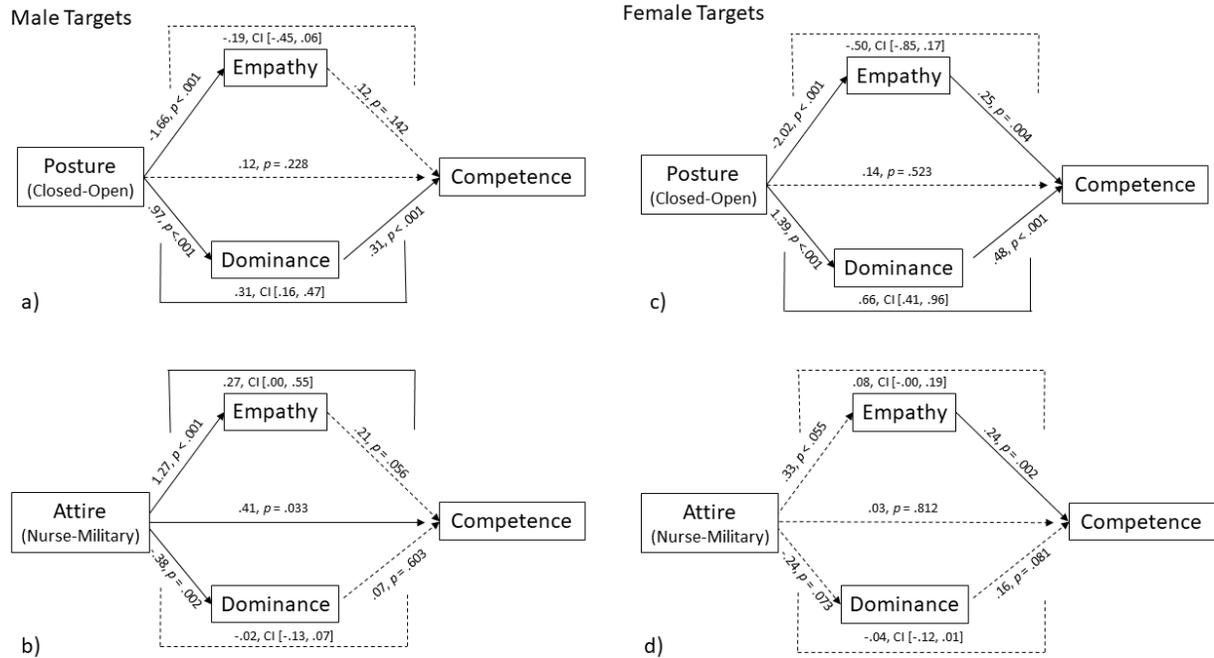
Figure 4. Parallel within-subject mediation analyses (Montoya & Hayes, 2017) of the effects of closed vs. open Posture (a, c) and nurse vs. military Attire (b, d) on perceived competence via dominance and empathy, separated by gender of the target (a, b: male; c, d: female). Solid lines indicate significant paths, and solid brackets indicate significant mediation effects. The central path in each panel indicates the direct effect (path c´) when controlling for the mediators. Ninety-five percent Monte Carlo confidence intervals (CIs) were generated from 10,000 bootstrap samples.