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Halo Effect of Faces and Bodies: Cross-Cultural Similarities and Differences Between German and Japanese Observers

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Abstract
According to the halo effect, person perceptions are globally biased by specific traits or characteristics. Attractive people are attributed positive traits like prosociality, health, and dominance. Due to a strong focus on facial stimuli it remains unclear whether this effect can also be found for bodies. Furthermore, most studies involved observers from individualistic cultures. This preregistered study explored the consistency of halo effects for men's faces and bodies for individualistic and collectivistic observers. Facial photos and 3D body scans of 165 German men were judged separately for attractiveness, prosociality, health, and physical dominance by 123 German and 100 Japanese observers. Results were mostly consistent between both observer groups and revealed strong attractiveness halo effects for faces and bodies, and a physical dominance halo effect for bodies. This study provides new insights on consistent halo effect biases in person perception for faces and bodies for observers with different cultural backgrounds.

Introduction

The halo effect is a cognitive bias in person perception in which the impression of a person is influenced by their specific traits or characteristics, including physical attractiveness (Thorndike, 1920). One prominent version, the *physical attractiveness stereotype* or the *"what is beautiful is good" principle*, suggests that attractive people are attributed positive traits such as social competence, intelligence, prosociality, health, and dominance (meta-analytic $r = .28$, $k = 76$ samples, overall $N =$ approx. 8,208, Eagly et al., 1991; meta-analytic $r = .24$, $k = 30$ samples, overall $N = 1,880$, Langlois et al., 2000). Such attributions fundamentally shape social interactions, like people's decisions about whom to trust and cooperate with, to compete with or avoid in social interactions, and

whom to choose as a romantic partner, for example based on perceived reproductive health and potential (e.g. Harris & Garris, 2008; Haselton & Funder, 2006; Jones et al.,

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2021). A range of studies has demonstrated the halo effect for judgments based on facial appearance for attributes like attractiveness, health, and prosociality, mostly within individualistic Western cultures (e.g. Bak, 2010; Dion et al., 1972; Dion et al., 1990; Engell et al., 2007; Fruhen et al., 2015; Jones et al., 2021; Lee et al., 2017; Moore et al., 2011).

While most evidence comes from individualistic Western cultures (Batres & Shiramizu, 2022), differences in person perception between individualistic and collectivistic cultures have been claimed. For example, Markus and Kitayama (1991) propose that different construals of the self as independent versus interdependent (mostly in Western and Eastern countries, respectively) have meaningful implications for social phenomena including person perceptions. It remains an open question whether such halo effects are apparent in observers with a collectivistic cultural background. That is, are attributes such as attractiveness related positively to attributes like dominance or prosociality from the perspective of observers with a different cultural background as well? Prosocial attributes signalling a stronger interdependent orientation in social relationships may be valued more in collectivistic than individualistic cultures, in contrast to attributes like dominance (e.g. Dion et al., 1990; Wheeler & Kim, 1997). Furthermore, as the halo effect has been studied mainly for faces, it is unclear whether it can also be detected for bodies exclusively. Thus, this study aims at replicating and extending earlier findings on the halo effect, comparing it between observers from an individualistic versus a collectivistic culture to pinpoint its robustness across different observers' cultural backgrounds, judging attractiveness and further relevant attributes not only from facial, but also from bodily stimuli.

Halo effects can be explained theoretically by both evolutionary theories (sexual selection mechanisms like intrasexual competition and mate choice, parental investment theories) as well as socialisation and self-fulfilling prophecy theories (Langlois et al., 2000). The former, evolutionary theories posit that targets' physical characteristics like bodily symmetry, morphological dimorphism, and muscularity are cues to underlying phenotypic and genotypic qualities impacting their mate and social values (Williams & Lee Apicella, 2023), leading to associations between socially relevant attributes, including perceived attractiveness, health, and dominance. According to the latter, more social psychological theories, cultural norms, values, and stereotypes influence the behaviour of targets and perceptions of observers, thus strengthening correlated perceptions for attributes like attractiveness, dominance, or prosociality. Further, hypotheses on personality recalibration or reactive heritability suggest that individual differences in prosociality or extraversion, for instance, are calibrated to physical characteristics like physical strength or attractive features (von Rueden et al., 2015, but see von Borrel et al., 2019 for mostly null findings). These associations, if robust, could be inferred by observers based on their experiences from previous social interactions, and may further strengthen halo effects. As a detailed theoretical review is beyond the scope of this article, see elsewhere for more thorough accounts of theoretical perspectives (Jussim, 2012; Krebs & Denton, 2013; Langlois et al., 2000; Snyder et al., 2011). Empirically, the "what is beautiful is good" attractiveness halo effect has been established by studies in individualistic Western cultures (p. 285, Dion et al., 1972). Dion and colleagues (1972) found that attractive individuals were perceived as having more socially desirable personality traits such as altruism and kindness ($N = 6$ stimuli, $N = 60$ male and female observers). A meta-analysis concluded that robust attractiveness halo effects had been shown on perceived social competence, potency, adjustment, and intellectual competence, whereas effects were close to zero for integrity and concern for others (Eagly et al., 1991; for more recent studies on attractiveness, health, masculinity/dominance, and trustworthiness see Batres & Shiramizu, 2022; Boothroyd et al., 2013; Fruhen et al., 2015; Lee et al., 2017). These findings suggest halo effects for faces at least in individualistic Western cultures, including attractiveness, trustworthiness, health, and dominance.

Cross-Cultural Convergence of Halo Effects

Evolutionary accounts of halo effects would predict stronger cross-cultural agreement in person judgments, whereas socialisation and self-fulfilling prophecy theories suggest lower cross-cultural consistency due to differences in norms, values, and stereotypes (Langlois et al., 2000). Studies demonstrated that at least perceptions of facial attractiveness are cross-culturally highly convergent. Observers from different cultural backgrounds mostly agree on how attractive different faces appear to be (e.g. meta-analytic $r = .94$, $k = 17$ samples, overall $N = 12,146$, Langlois et al., 2000; but see Zhan et al., 2021 for recent findings on culture-specific attractive face features). Still, the strength and content of the attractiveness halo effect concerning associations of attractiveness perceptions with other attributes may differ between cultures. On the one hand, the halo effect may be weaker in collectivistic (e.g. Asian) than individualistic cultures (e.g. North American or European), because people from individualistic cultures are assumed to place more value on features like attractiveness (Dion et al., 1990). On the other hand, the attractiveness halo effect might differ in its exact manifestation. For example, Wheeler and Kim (1997, $N =$

30 facial photos as stimuli, $N = 157$ raters) found similar associations of perceived attractiveness with perceived social competence, intelligence, and sexual interest between Korean and North American observers. Attractiveness effects on individualistic attributes (e.g. perceived potency/dominance) were smaller than on collectivistic attributes (e.g. concern for others) in Koreans in contrast to Western societies (e.g. Eagly et al., 1991). Wheeler and Kim (1997) argued that because in collectivistic cultures traits that signal interdependent orientations in relationships are more valued than in Western cultures, perceived dominance was not associated with perceived attractiveness in their collectivistic sample (for similar findings, see Shaffer et al., 2000). A recent study showed relatively consistent halo effect across eleven world regions (including Asian, European, and American countries, $N = 11,570$ raters, $N = 120$ face stimuli, Batres & Shiramizu, 2022). Faces perceived as more attractive were judged to be more confident, emotionally stable, intelligent, responsible, sociable, and trustworthy, with descriptively rather small effect size differences across world regions. In sum, there is still only limited consensus surrounding cross-cultural similarities and differences in the attractiveness halo effect for judgments based on facial stimuli.

Person Perception Based on Bodies

Bodies also play an important role in person perception, conveying crucial information in social encounters. While faces may have a stronger effect on overall impressions of attractiveness than bodies (Currie & Little, 2009) and judgments of dominance have been shown to be more accurate based on faces than bodies (Rule et al., 2012), bodies may similarly influence perceptions of other attributes like sociability (Alicke et al., 1986). Furthermore, the perception of men's bodily dominance has a positive effect on women's mate choice (e.g. Snyder et al., 2011). In intrasexually competitive contexts the assessment of men's appearance provides cues to their physical condition and dominance. Such assessment is central for deciding whether to compete with a given individual or not (Sell et al., 2009a). The meta-analysis by Eagly and colleagues (1991) included 15 studies with full body stimuli, for which an overall positive and significant attractiveness halo effect was found. However, these full body stimuli most likely included the faces, so that a specific effect for bodies only has not been investigated yet. Coy and colleagues (2014) found a positive association between perceived attractiveness and dominance based on body avatars (including heads) created from body scans ($r = .45$, $N = 15$ stimuli, $N = 151$ female observers), and Crossley (2015) showed a strong positive correlation between perceived attractiveness and health (bodily images including heads, $r = .84$, $N = 10$ stimuli, $N = 486$ observers).

Further studies showed that bodily characteristics like the waist-to-chest ratio, upper body "V-shapedness", body mass index (BMI), and the waist-to-hip ratio simultaneously influence perceptions of attributes like attractiveness, health, and dominance ($N = 192$ stimulus bodily photos, $N = 63$ observers, Brierley et al., 2016; Coy et al., 2014; $N = 24$ stimulus figures, $N = 90$ observers, Furnham et al., 1997; $N = 50$ stimulus bodily photos, $N = 82$ observers, Swami et al., 2006; $N = 50$ stimulus bodily photos, $N = 30$ observers, Tovée et al., 1999). Further research investigated stereotypes based on bodily characteristics like weight. Greenleaf and colleagues (2006) showed that observers were more willing to engage in social, academic, and recreational activities with thin compared to overweight individuals ($N = 274$ observers). In Grant and Mizzi (2014), an overweight job applicant was judged as less attractive and less suitable for a vacant position in an organisation ($N = 152$ observers).

Such indirect evidence would suggest interrelations and hence halo effects for these attributes for bodies as well. Concerning a cross-cultural perspective, while initial studies have shown that perceptions of bodily attractiveness are consistent for observers from different cultural backgrounds (Dixson et al., 2007; Swami et al., 2006), a specific investigation of the halo effect for bodies is lacking.

Aims and Hypotheses

To tackle these questions, in this preregistered study we investigated different aspects surrounding the halo effect, engaging a cross-cultural perspective regarding observers' cultural backgrounds. Besides attractiveness, we selected three further attributes implicated in person perception which are relevant for a range of social interactions and within different social domains: Firstly, physical dominance as a crucial attribute for intrasexual and intersexual selection, influencing decisions whether to compete or avoid conflict with an individual (Stirrat & Perrett, 2010) and which has been related to attractiveness (framed as formidability, Eisenbruch et al., 2016; Lukaszewski et al., 2016) as well as mating success (Kordsmeyer et al., 2018), secondly, prosociality as an attribute highly implicated in tendencies to trust and cooperate with an individual (Lee et al., 2017) and crucial for societal functioning (Kogan et al., 2014), and thirdly, health which strongly influences cooperativeness and an individual's desirability as a mate (Thornhill & Gangestad, 1999), since observers should be selected to perceive healthy individuals as attractive (Langlois et al., 2000).

Firstly, this preregistered study ([blinded for peer-review]) aimed to replicate the attractiveness halo effect and to examine further halo effects for men's faces, investigating associations between perceived attractiveness,

physical dominance, prosociality, and health. We hypothesised positive correlations between these four attributes (except for associations between perceived physical dominance and prosociality as orthogonal dimensions, Oosterhof & Todorov, 2008). Secondly, mixed findings regarding a cross-cultural consistency of halo effects for faces were sought to be clarified by employing two samples of observers, one from an individualistic (Germany) and another from a collectivistic culture (Japan). We hypothesised similar halo effects for both samples of observers, whereby associations of attractiveness with prosociality may be stronger and associations with physical dominance may be weaker in Japanese than German observers (Wheeler & Kim, 1997). Thirdly, we aimed to extend the few findings on the attractiveness halo effect for bodies exclusively (omitting the head and face), also exploring observers' cross-cultural differences of potential halo effects. Based on the meta-analysis including at least some studies on bodies (Eagly et al., 1991) and indirect evidence on bodily characteristics (e.g. Swami et al., 2006; Tovée et al., 1999), we hypothesised similar halo effects for bodies as for faces (and respective cross-cultural differences for observers).

Methods

Transparency, Openness, and Reproducibility

The data, analysis script, and materials are available at https://osf.io/k9fru and the preregistration at https://osf.io/q3kzf.

Facial and Bodily Stimuli

As part of a larger study involving further variables not relevant to this investigation (see Kordsmeyer et al., 2018; Kordsmeyer & Penke, 2019), two facial photographs each were taken from 165 German target men (age: $M = 24.2$ years, $SD = 3.3$, range 18–34) while standing in front of a white wall from a distance of two m, with the participants directly facing the camera (Canon EOS 350D) and showing a neutral facial expression. The more suitable of the two photos (in terms of neutral facial expression and standardized head position) was chosen. One facial photo had to be excluded due to issues with the photograph (poor quality). All 165 target men were scanned three times using a Vitus^{smart}XXL body scanner and AnthroScan software (both Human Solutions GmbH, Kaiserslautern, Germany; Kordsmeyer & Penke, 2019). Three-dimensional body scans were converted into "beauty turn" videos (each lasting 8 sec.), in which a body was turning around its vertical axis (Figure 1). Thirteen body scans had to be excluded due to issues with the scans (e.g. poor quality) resulting in a final sample of 152 beauty turns. For German observers only, to reduce rater strain, the 152 beauty turns were divided into two sets of 76 videos each matched for BMI to yield sets similar in body compositions. These two sets were rated by separate groups of (German) observers, whereas Japanese observers rated the full set of bodies, as outlined below. Sensitivity power analyses conducted using G*Power 3.1 (Faul et al., 2009) suggested that both the sample sizes of 164 targets for faces and of 152 targets for bodies would allow to detect small-to-medium effect sizes of $\rho \geq .19$ with 80% power at $\alpha = .05$ (one-tailed for preregistered hypotheses, Cho & Abe, 2013; Lakens, 2016).

Observers

Overall 90 German women (age: $M = 23.2$ years, $SD = 5.3$) and 61 German men ($M = 25.2$ years, $SD = 5.6$), recruited at the University of Goettingen, and 60 Japanese women ($M = 22.1$ years, $SD = 2.0$) and 40 Japanese men ($M = 22.2$ years, $SD = 2.0$), recruited at the University of Tokyo, judged target men's facial and bodily stimuli (10–12 observers per attribute, see below; small deviations of observer numbers from the preregistered 10 observers are due to the German rating data having been collected before the preregistration was published (except for facial attractiveness), we decided to also use the ratings beyond those from the first 10 observers to increase reliability). Observers received monetary compensation or course credit in return.

Rating Procedures

For facial ratings, the photos of target men's faces were presented on computer screens. Observers saw a preview of the whole sample, with each picture being displayed for 0.5 sec. one after another, to provide a first impression of the target men's whole sample. Then, observers viewed the pictures in randomized order, one at a time and viewing a photo for as long as they wanted, directly followed by the rating item (see below). For bodily ratings, observers watched a preview with screenshots of the whole sample (half of the sample for German raters), with each beauty turn being displayed for 1 sec. one after another, to provide a general impression about the range of different body statures. Observers viewed the beauty turns in randomised order, one at a time and for as long as they wanted (after the first full 360° turn), directly followed by the rating item (see below).

Ratings by German Observers

Faces and bodies were rated for attractiveness ("How attractive is this man?"; initially for German observers rating facial attractiveness two items instead of one item

Figure 1. Screenshot of a Beauty Turn Video Used for the Bodily Ratings.

had been preregistered due to available data, see Tables S7-S8 in the supplementary), prosociality (aggregate of three items: "How trustworthy/kind/compassionate is this man?", Kogan et al., 2014), physical dominance ("How likely would this man win a physical fight against another man?"), and health ("How healthy is this man?") using 11-point Likert scales (ranging from −5 = "not at all attractive", "not at all trustworthy/kind/compassionate", "very unlikely", and "not at all healthy" to +5 = "very attractive", "very trustworthy/kind/compassionate", "very likely", and "very healthy", respectively) by separate groups of raters per attribute (except for ratings of facial physical dominance and health which were provided by the same German men, for exact distributions of rater numbers see Table 1).

Ratings by Japanese Observers

The same faces and bodies were each rated for attractiveness, prosociality, physical dominance, and health (same items and 11-point Likert scales as above for German observers) by separate groups of raters per attribute (for exact distributions of rater numbers see Table 1).

Statistical Analyses

Bivariate Pearson correlations were calculated to examine associations between the main variables perceived attractiveness, physical dominance, prosociality, and health for both faces and bodies. Female and male observers' prosociality ratings were aggregated for each German and Japanese groups of observers (Cronbach's α internal consistencies = .86–.96 for both groups of observers for both faces and bodies). All analyses were performed using R (R Core Team, 2015). Following the preregistration, one-sided tests were used for directional hypotheses (Cho & Abe, 2013; Lakens, 2016) and results below are marked if effects were only significant for one-sided testing. To investigate the robustness of our findings, we ran partial correlations including the preregistered control variables target men's age (e.g. see Zebrowitz & Franklin, 2014) and target men's relationship status (binary: single vs. open relationship/committed relationship/engaged/married). To correct for multiple testing, we applied a Benjamini-Hochberg correction (Benjamini & Hochberg, 1995) for the bivariate correlations. Furthermore, in exploratory analyses the strength of halo effects (i.e. correlations between the four perceived attributes) and of associations between facial and bodily ratings on the same attributes were compared for German versus Japanese observers employing Fisher's z transformation (Fisher, 1915). Additional analyses (e.g. on hormonal correlates of observer perceptions, on correlated perceptions of faces and bodies as suggested by the one ornament hypothesis, Třebický et al., 2023) mentioned in the preregistration were omitted as they turned out to be beyond the scope of this article.

Results

Table 2 shows descriptive statistics for all German and Japanese ratings of faces and bodies with corresponding observers' sample sizes and correlations between German and Japanese observers' ratings. Overall, German and Japanese observers' ratings of faces and bodies were highly correlated (r = .29–.91).

Facial Ratings

Table 3 depicts correlations between the four attributes' ratings of faces, separately for Japanese and German observers (all results using the initially preregistered 2-item measure for facial attractiveness for German female observers were virtually identical, see Tables S9-S12). Facial attractiveness correlated positively with facial prosociality and facial health for both German and Japanese observers (Table 3). Facial health showed a positive association with facial prosociality for German and Japanese observers. Facial attractiveness was not significantly related to facial physical dominance for either German or Japanese observers (Table 3). Facial physical dominance inversely correlated with facial prosociality for German

and Japanese observers and was positively associated with facial health in German raters. All correlations remained virtually unchanged when controlling for target men's age and relationship status (Table S1). Applying a Benjamini-Hochberg correction for multiple testing did not affect the correlations' statistical significance (Table S2). Exploratory analyses using z-tests after Fisher's z-transformations indicated that most halo effects for faces were not significantly different between German and Japanese observers. These correlations were not significantly different for Japanese versus German observers (all unsigned zs < 1.94, ps > .054, see Table S3).

Table 1. Overview of Rater Numbers per Attribute and Rater Nationality.

	#German raters		#Japanese raters	
Stimuli and attributes	Men	Women	Men	Women
Facial				
Attractiveness		10		10
Health	11[a]			10
Prosociality	10	10	10	10
Physical dominance	11[a]		10	
Bodily				
Attractiveness		30[b]		10
Health		20[b]		10
Prosociality	20[b]	20[b]	10	10
Physical dominance	20[b]		10	

[a]Facial health and physical dominance were rated by the same German men.
[b]ratings of bodies were performed in 2 sets of bodies by 10–15 German raters each.

Bodily Ratings

Table 4 shows correlations between the four attributes' ratings of bodies, separately for Japanese and German observers. Bodily attractiveness correlated positively with bodily health, physical dominance, and prosociality for both German and Japanese observers (Table 4). Bodily physical dominance was positively related to bodily health for both German and Japanese observers. Bodily health and physical dominance showed a positive relationship with bodily prosociality for Japanese but not German observers. All these bivariate associations were robust to controlling for target men's age and relationship status (Table S4) and to applying a Benjamini-Hochberg correction for multiple testing (except for the positive association between bodily attractiveness and prosociality for German observers turning non-significant, p = .06, Table S5). Exploratory analyses using Fisher's z-transformations revealed that the following four halo effects for bodies were significantly stronger for Japanese than German observers: associations between health and attractiveness (z = 2.29, p = .022), prosociality and attractiveness (z = 6.00, p < .001), health and prosociality (z = 6.29, p < .001), and between prosociality and physical dominance (z = 4.66, p < .001, other unsigned zs < 1.41, ps > .080, Table S6).

Discussion

We investigated cross-cultural differences and similarities in the attractiveness halo effect and further halo effects for German men's faces and bodies for observers from an individualistic (German) and a collectivistic (Japanese) culture. We replicated and extended earlier findings on halo effects regarding associations between the perceived

Table 2. Means and Standard Deviations of All Facial and Bodily Ratings and Correlations Between German and Japanese Observers.

	Japanese ratings			German ratings			Correlations	
	M	*SD*	α	*M*	*SD*	α	*r*	95% CI
Facial								
Attractiveness	−0.62	1.16	.85	−0.61	1.39	.89	.71***	[.63, .78]
Health	0.10	1.55	.83	0.51	1.39	.84	.51***	[.38, .61]
Prosociality	0.12	1.22	.72–.87†	0.67	1.00	.69–.79†	.67***	[.57, .74]
Physical dominance	0.50	1.35	.71	0.40	1.43	.88	.72***	[.63, .78]
Bodily								
Attractiveness	0.11	2.00	.94	−0.18	1.83	.92–.94†	.90***	[.87, .93]
Health	−0.26	1.76	.93	0.57	1.80	.91–.95†	.91***	[.87, .93]
Prosociality	0.27	0.79	.48–.82†	0.46	0.64	.26–.55†	.29***	[.14, .43]
Physical dominance	−0.07	1.65	.89	0.37	1.67	.91–.92†	.87***	[.82, .90]

Note. N indicating number of observers; N for target stimuli = 152–164; α = Cronbach's alpha interrater reliability, separately for male and female observers; † = range for the three prosociality items, or two rating sets for bodies for German observers; 95% CI = 95% confidence intervals; ***p < .001 (one-tailed due to preregistered hypotheses).

Table 3. Bivariate Pearson Correlations Between All Attributes' Facial Ratings for German and Japanese Observers.

	Attractiveness	Health	Prosociality	Physical Dominance
Attractiveness		.62*** [.51, .71]	.53*** [.40, .63]	.11 [-.04, .27]
Health	.60*** [.49, .69]		.56*** [.44, .65]	.19** [.04, .33]
Prosociality	.60*** [.50, .69]	.69*** [.60, .76]		−.25*** [-.39, −.10]
Physical dominance	−.09 [-.24, .06]	−.01 [-.16, .14]	−.16* [-.30, −.01]	

Note. Correlations for Japanese observers are in the bottom-left, for German observers in the top-right half; 95% confidence intervals in square brackets; *p < .050, **p < .010, ***p < .001 (one-tailed due to preregistered hypotheses).

Table 4. Bivariate Pearson Correlations Between All Attributes' Bodily Ratings for German and Japanese Observers.

	Attractiveness	Health	Prosociality	Physical Dominance
Attractiveness		.90*** [.86, .92]	.17* [.02, .33]	.44*** [.31, .56]
Health	.94*** [.92, .96]		.10 [-.05, .26]	.43*** [.29, .55]
Prosociality	.70*** [.61, .77]	.68*** [.59, .76]		.01 [-.15, .17]
Physical dominance	.30*** [.15, .44]	.37*** [.22, .50]	.50*** [.37, .61]	

Note. Correlations for Japanese observers are in the bottom-left, for German observers in the top-right half; 95% confidence intervals in square brackets; *p < .050, ***p < .001 (one-tailed due to preregistered hypotheses).

attributes attractiveness, prosociality, health, and physical dominance for faces, with similar associations for German and Japanese observers. Novel effects were shown for perceptions of bodies (omitting information on targets' faces), in that more attractive bodies were seen as healthier, more prosocial, and more physically dominant by both German and Japanese observers. A further consistent halo effect was shown for physical dominance for bodies, but not faces. Bodies perceived as more physically dominant were seen as healthier, more prosocial (only for Japanese observers), and more attractive. Exploratory analyses showed that halo effects for faces were of comparable strength for German and Japanese observers, but some were stronger for Japanese than German observers for bodies, as we outline below.

For both German and Japanese observers, we found attractiveness halo effects on perceived facial health and prosociality, but not physical dominance (replicating earlier findings except for dominance, e.g. Boothroyd et al., 2013; Eagly et al., 1991; Langlois et al., 2000). Healthy faces were perceived as more prosocial and physically dominant (the latter only by German observers, though note that physical dominance and health were rated by the same group of German observers, so that rater bias may play a role as well), while physically dominant faces were seen as less prosocial. The latter effect supports earlier findings (e.g. Fruhen et al., 2015) and the hypothesis that dominance and trustworthiness (as a facet of prosociality, Kogan et al., 2014) are orthogonal dimensions of interpersonal perception (Oosterhof & Todorov, 2008). There were no significant cross-cultural differences in face perceptions. Descriptively, associations of physical

dominance with attractiveness and health were (positive and) stronger for German compared to Japanese observers (as hypothesised for attractiveness, line with Wheeler & Kim, 1997), whereas the correlations between health and prosociality were stronger for Japanese than for German observers. These may reflect the weaker (or inverse) preference for individualistic attributes like dominance and stronger preference for collectivistic attributes like prosociality in more collectivistic cultures (in line with Eagly et al., 1991; Shaffer et al., 2000; Wheeler & Kim, 1997). Still, the fact that these differences were relatively small and non-significant is more in line with the recent large study on halo effects across eleven world regions (Batres & Shiramizu, 2022). Overall, our results indicate that attractive and healthy faces elicit robust halo effects in both German and Japanese observers, supporting previous studies (e.g. Bak, 2010; Eagly et al., 1991; Langlois et al., 2000; Moore et al., 2011).

We provided novel evidence for halo effects for bodies, extending the few extant studies, which mostly employed full body stimuli including head information (e.g. Eagly et al., 1991). We found attractiveness halo effects on health, physical dominance, and prosociality, in line with indirect evidence on observer perceptions' relationships with bodily characteristics (Swami et al., 2006; Tovée et al., 1999). In contrast to the respective effects for faces, we present new evidence on a physical dominance halo effect for bodies only. Bodies with a more physically dominant appearance were perceived as healthier, more attractive and prosocial. These correlations are in line with the few available findings, at least for associations of perceived attractiveness with dominance and health (Coy

et al., 2014; Crossley, 2015). While these halo effects are mostly in concordance with those for faces for German observers, they contradict those for faces for Japanese observers, pointing towards cross-culturally different halo effects for bodies compared to faces. Both German and Japanese observers judged more dominant bodily characteristics in men to be healthier and more attractive, purportedly as signals of desirable qualities like resource acquisition potential and protection ability, in line with evolutionary theorizing, based on mechanisms of intrasexual competition and mate choice (Coy et al., 2014; Sell et al., 2009a, 2009b; Snyder et al., 2011). Earlier studies reported associations of perceived attractiveness, health, and dominance with the waist-to-chest ratio, upper body "V-shapedness", body mass index (BMI), and the waist-to-hip ratio (Coy et al., 2014; Furnham et al., 1997; Swami et al., 2006; Tovée et al., 1999). Future studies should set out to examine which bodily cues and characteristics moderate the halo effects shown in this study. Further, the positive association between perceived physical dominance and prosociality for Japanese observers contradicts, while the null-effect for German observers supports the hypothesis that dominance and trustworthiness are orthogonal dimensions of interpersonal perception (Oosterhof & Todorov, 2008). The former positive effect is unexpected, given that physically dominant men tend to be more aggressive (Sell et al., 2009b, but see von Borell et al., 2019), and has not been shown in earlier research (see Fruhen et al., 2015 on faces). Especially based on the low interrater agreement for bodily prosociality, these findings should be replicated in future studies.

Overall, person perception of attractiveness and physical dominance based on bodies revealed similar, but not equivalent, halo effects as for faces. Such associated perceptions of bodies likely have consequences in social interactions, such as inferences concerning mate value (Thornhill & Grammer, 1999) and whether to compete with a focal individual or not (Sell et al., 2009a). The perceptions of bodies in this study were based on three-dimensional views of target men's bodies, with the men only wearing standardised underwear, rendering the results more valid than perceptions based on static two-dimensional body photos (e.g. Sell et al., 2009a). Since judgments in our study were based primarily on morphological information, future studies should set out to replicate our findings using stimuli providing information on skin colour and texture (relevant for health perceptions, for instance, Henderson et al., 2016).

In our study, halo effects were mostly consistent between German and Japanese observers. Explorative analyses revealed that some associations for bodies were stronger for Japanese than German observers, namely the associations of prosociality with attractiveness, health, and physical dominance and of attractiveness with health. A stronger link between perceived attractiveness and prosociality for observers from a collectivistic culture can be explained by traits and characteristics associated with the promotion of harmonious relationships being valued more (Wheeler & Kim, 1997). At least for bodies, this may mean that in individualistic cultures people are assessed more analytically, with their characteristics being perceived more separately, whereas in collectivistic cultures individuals are seen more holistically and embedded within their social networks (e.g. Markus & Kitayama, 1991). The finding of stronger halo effects for bodies in observers with a collectivistic versus an individualistic cultural background deserves further investigation and needs to be replicated in subsequent studies. This study underlines the notion that observers from both collectivistic and individualistic cultures show halo effects, while the exact manifestations differ, more so for bodily than for facial stimuli (cf. Shaffer et al., 2000; Wheeler & Kim, 1997). The cross-culturally more similar halo effects for faces are in line with evolutionary accounts of halo effects, whereas stronger cross-cultural differences in halo effects for bodies are more in accordance with socialisation and self-fulfilling prophecy theories (Langlois et al., 2000). This pattern may seem surprising, since faces are highly prevalent in social interactions and cross-culturally different norms, values, and stereotypes should elicit a stronger divergence in halo effects. The only descriptively noteworthy differences were found for perceived physical dominance, corroborating earlier findings for this more individualistic attribute (Eagly et al., 1991; Wheeler & Kim, 1997). For bodies, cross-cultural differences were detected for associations with perceived prosociality only, whereas effects were very similar when this attribute was not involved, more in line with evolutionary accounts of person perception (Langlois et al., 2000). Since reliability was very low for this attribute, results on cross-cultural differences are less robust. Future studies should set out to replicate these differential findings, striving for increased reliability of ratings by using a larger number of observers, reducing the number of bodies per observer, or even adding original skin colour and texture information (rather than showing bodies in standardised greyscale only).

Within all cultures, a crucial question is whether these halo effects predict actual behaviour and outcomes, in that more attractive people behave in a more dominant way and are healthier, on average, or whether these correlated perceptions are indeed biases resulting in invalid stereotypes (as suggested by Thorndike, 1920). In line with recent claims that it remains unclear what attractiveness signals (Jones et al., 2021), initial findings on the validity were mixed (e.g. on perceived facial attractiveness and dominance and health measures, Bulczak & Gugushvili, 2023; Foo et al., 2017; Hume & Montgomerie, 2001; Skrinda et al., 2014; Thornhill & Gangestad, 2006; for a

review see Weeden & Sabini, 2005; on perceived bodily attractiveness and objectively measured strength or health, Sell et al., 2017; Smith et al., 2007). Thus, it seems that some of the halo effects may have partial external validity, though these associations need to be examined further.

A further step to better understand these halo effects would be to investigate which cues (facial and bodily characteristics) these associated perceptions are based on. For example, masculine facial traits have been proposed to signal genetic quality or immunocompetence, and hence mate quality in men, suggesting that masculine facial traits should not only predict perceived physical dominance, but also health and attractiveness (Boothroyd et al., 2007; Thornhill & Gangestad, 1999; Zhao et al., 2023). One component of facial masculinity is the facial width-to-height ratio (fWHR, Dixson, 2021). Earlier studies showed that fWHR is associated with perceptions of dominance and (inversely) attractiveness and trustworthiness (Lee et al., 2017; Stirrat & Perrett, 2010). Another masculine facial characteristic is the degree of sexual dimorphism (i.e. how typically masculine or feminine a face appears), which relates to both health and dominance perceptions (e.g. Kleisner et al., 2023; Rhodes et al., 2003). Further characteristics influencing perceptions are facial symmetry and averageness, which are linked to both facial attractiveness and health (e.g. Foo et al., 2017; Kleisner et al., 2023), and men's beardedness as a predictor of perceived attractiveness and dominance (Dixson et al., 2016; Neave & Shields, 2008). Concerning bodies, characteristics such as the BMI, waist-to-chest ratio, upper body "V-shapedness", body mass index, and waist-to-hip ratio influence men's perceived attractiveness, dominance, and health (Brierley et al., 2016; Coy et al., 2014; Furnham et al., 1997; Kordsmeyer, Stern, & Penke, 2019; Swami et al., 2006; Tovée et al., 1999). Another study demonstrated a cross-culturally consistent influence of men's gait on perceived attractiveness and physical strength (Fink et al., 2017). Future studies should examine these cues and moderating influences on halo effects.

Since in our study we aggregated observer ratings and used mean-level data, we did not focus on interindividual differences in observers. Further research could investigate cognitive and personality-related variables which influence these person perceptions and subsequent halo effects. Regarding person perception more generally, earlier studies have shown an impact of women's use of hormonal contraception, menstrual cycle status and relationship status on facial masculinity preferences (Feinberg et al., 2008; Little et al., 2002; Williams & Lee Apicella, 2023). Further, observers' own attractiveness has been shown to affect attractiveness judgments, so far mainly in animal species such as birds (Holveck & Riebel, 2010; Riebel et al., 2010), with only few studies in humans (e.g. Little et al., 2002). Regarding cross-cultural differences,

observers' interindividual differences in self-construals could be examined as a potential moderator (Markus & Kitayama, 1991). In earlier studies, observers' self-construal has been demonstrated to be a potential source of bias in performance judgments (e.g. Mishra & Roch, 2013; Tanaka & Ross, 2023). Thus, these variables influencing judgments of individual attributes deserve further attention to subsequently better understand halo effects and processes of person perception generally (for a review on personality-related processes, see e.g. Kuper et al., 2021).

Some limitations to our findings need to be acknowledged. Generally, third variables not assessed in this study may partly explain or confound the results observed, for example as a collider bias due to participants' educational status (for further explanation see Grosz et al., 2020; Rohrer, 2018). The influence of relevant confounding or collider variables should be investigated in future studies. As a further central limitation, this study included male targets only, thus restricting our findings' generalisability. Since earlier evidence already indicated a sex difference in halo effects for faces (e.g. Eagly et al., 1991; Wheeler & Kim, 1997), future studies should examine these associations for female targets, replicating and extending them by employing bodily stimuli. Also, facial and bodily stimuli only from Western Europe were used, so that German observers judged target men with an identical cultural background, but Japanese judged men from a different cultural background. Therefore, we cannot exclude the possibility that Japanese observers judged the German faces and bodies more superficially or with less motivation due to the *own-race effect*, the tendency that faces from the own ethnic group are recognised more accurately than faces from other ethnic groups (Tanaka et al., 2004; see Pavlovič et al., 2023 showing very similar associations between perceived facial attractiveness and facial shape cues for European vs. Asian observers judging Asian faces). However, interrater agreements were very similar for German and Japanese observers, suggesting that at least within the groups of Japanese observers the agreement was comparable to German observers. Still, future studies should compare results for stimuli from the same versus a different (relative to observers') ethnic group, also to examine whether halo effects are consistent across stimuli with different cultural backgrounds (e.g. as in Shaffer et al., 2000). One study compared Western observers' judgments of Western and Asian target men and women and showed similar intercorrelations between perceived attractiveness and health (Rhodes et al., 2007). Relatedly, even though in this study interrater reliabilities were good for most attributes, for prosociality low interrater reliabilities became apparent, especially for bodies. Apparently, the three items on trustworthiness, compassion, and kindness were more difficult to judge, particularly for bodies. This concords with an earlier finding in which interrater reliabilities were lower for

perceived facial trustworthiness than attractiveness and masculinity (Lee et al., 2017). A follow-up study should replicate these findings, potentially providing definitions of these three facets, to enhance observers' understanding and render the judgments being more consistent between observers. Regarding dominance, the item observers answered for this attribute was focussed on one aspect of dominance, which could be termed physical dominance (Kordsmeyer, Freund et al., 2019) or formidability (Eisenbruch et al., 2016; Lukaszewski et al., 2016), that is also more readily perceivable from facial and bodily stimuli than other facets of dominance. It would be interesting to investigate halo effects and respective cross-cultural differences for other facets, such as social dominance (e.g. Qu et al., 2017). Finally, besides faces and bodies further modalities could be investigated, such as voices and body odour (Williams & Lee Apicella, 2023), to extend the halo effects shown in this study. Previously, associations between perceived attractiveness and dominance based on short vocal samples were demonstrated (McAleer et al., 2014). Another study pointed out that health perceptions from voices may be related to masculine vocal characteristics, but not to targes' self-reported health (Albert et al., 2021). Thus, the halo effect may be detectable not only for faces and bodies, but also for voices, with differing validities of these perceptions, which should be clarified in future research.

Overall, this study extends earlier findings on halo effects as a persistent and cross-culturally relatively consistent cognitive bias in person perception. Novel evidence is presented for a dominance halo effect for bodies, which was not detected for faces. These halo effects became apparent in naïve observers from both collectivistic and individualistic cultures not only when judging targets' faces, but also their bodies. For bodies, some of these halo effects were stronger for Japanese than German observers, differences which should be replicated in future studies. In conclusion, this study underlines strongly associated perceptions in both collectivistic and individualistic cultures amongst attributes playing a crucial role in person perception, adding to an understanding of more positive social outcomes for more attractive people, as they are being perceived as healthier, more dominant and prosocial, with both faces and bodies contributing to these biases.

Key insights

- Characteristics like attractiveness globally bias person perceptions (termed halo effect).
- Individualistic and collectivistic observers judged men's faces and bodies (preregistered).

- Halo effects were mostly consistent between German and Japanese observers.
- We found strong attractiveness halo effects for faces and bodies.
- A new physical dominance halo effect for bodies was shown.

Relevance statement

In a preregistered study, we extend findings on the halo effect as a cross-culturally ubiquitous bias in person perception not only for male faces, but also for bodies only, with similar effects in individualistic and collectivistic judges.

Author contributions

Atushi Ueshima: Data curation; Methodology; and Writing – review & editing.
Daniel Freund: Data curation; Formal analysis; Investigation; Visualization; Writing – original draft; and Writing – review & editing.
Kiri Kuroda: Data curation; Methodology; Software; and Writing – review & editing.
Lars Penke: Conceptualization; Resources; Supervision; and Writing – review & editing.
Tatsuya Kameda: Conceptualization; Resources; Supervision; and Writing – review & editing.
Tobias L. Kordsmeyer: Conceptualization; Data curation; Formal analysis, Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Validation; Visualization; Writing – original draft; and Writing – review & editing.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

ORCID iD

Not applicable.

Data accessibility statement

The data, materials, and preregistration required for reproducing the study results can be found on the OSF: https://osf.io/k9fru for data, documents, stimuli, images, scripts, codes, and other supplements; and https://psyarxiv.com/j23ny for pre-registration (a pre-data pre-registration was conducted; results of most preregistered analyses are reported and deviations are mentioned in the paper).

Supplemental material

Supplemental material for this article is available online. Depending on the article type, these usually include a Transparency Checklist, a Transparent Peer Review File, and optional materials from the authors.

Notes

Not applicable.

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