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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. However, 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 observers from individualistic and collectivistic cultures. Facial photos and 3D body scans of 165 German men were judged separately for attractiveness, prosociality, health, and 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 dominance halo effect for bodies, but not faces. Further predictions of the one ornament hypothesis were supported. This study provides new insights on halo effects as consistent cognitive biases in person perception for faces and bodies for observers with different cultural backgrounds.

Keywords: halo effect, attractiveness, person perception, individualistic culture, collectivistic culture

Introduction

As one of the most renown phenomena in social psychology, the *halo effect* has received considerable theoretical and empirical attention since its first mentioning in the early 20th century (Thorndike, 1920). It describes a consistent cognitive bias in person perception in which the impression of a person is influenced by their specific traits or characteristics. One prominent version, also referred to as the *physical attractiveness stereotype* or the *"what is beautiful is good" principle*, suggests that attractive people are attributed higher degrees of positive traits such as social competence, intelligence, prosociality, health, and dominance, compared to less attractive individuals (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, such as people's decisions about whom to approach, trust, and cooperate with, whom to compete with or avoid in social interactions, and whom to choose as a romantic partner (e.g. Harris & Garris, 2008; Haselton & Funder, 2006). A range of studies has demonstrated the halo effect for judgments based on facial appearance for attributes like attractiveness and prosociality, and 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; Lee et al., 2017; Moore et al., 2011).

While most evidence so far comes from individualistic Western cultures, 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 (mostly in Western countries) versus interdependent (mostly in Eastern countries) have meaningful implications for social phenomena, including an individual's perception of others. Hence, 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 perceived by observers with a different cultural background related positively to attributes like dominance

or prosociality as well? Attributes signalling a stronger interdependent orientation in social relationships, like prosociality, may be valued more in collectivistic compared to 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 separately (i.e., omitting information on targets' faces). Thus, this study aims at replicating and extending earlier findings on the halo effect, comparing the effect 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.

Various studies within individualistic Western cultures provided empirical evidence for the attractiveness halo effect, with the central tenet prominently summarised by the phrase "what is beautiful is good" (p. 285, Dion et al., 1972). For example, one study found attractive male and female stimuli to be perceived as having more socially desirable personality traits such as altruism, kindness, and stability (N = 60 male and female observers, Dion et al., 1972). However, based on its very low number of stimuli (N = 6), the study's results cannot be seen as particularly robust. A meta-analytic review 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). A more recent study showed mid-sized to large positive correlations between attractiveness, health, and masculinity ratings based on facial photographs (rs = .42–.80, N = 57 male targets, N = 11–25 male and female observers, Boothroyd et al., 2013). Perceived trustworthiness has been found to be related positively to attractiveness, but inversely to dominance (unsigned rs = .24–.58, N = 100 male and female targets, N = 1200 male and female observers, Fruhen et al., 2015; unsigned rs = .25–.26, N = 718 male targets, N = 7 male and female observers, Lee et al., 2017). Thus, there is abundant support for halo effects for faces at least in individualistic Western cultures, including the attractiveness halo effect and further associations between

attributes implicated in first impressions and following social interactions, like trustworthiness, health, and dominance.

Cross-cultural convergence of halo effects

Even though most studies mentioned so far were conducted using Western samples, further studies demonstrated that perceptions of facial attractiveness are cross-culturally highly convergent. Observers from different cultural backgrounds mostly agreed 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). Some studies have shown that the strength and content of the attractiveness halo effect may differ between cultures. Initially, the halo effect has been suggested to be weaker in observers from collectivistic (e.g. Asian) compared to individualistic cultures (e.g. North American or European), because people from individualistic cultures were assumed to place more value on features like attractiveness than people from collectivistic cultures (Dion et al., 1990, N = 12 facial photos as stimuli, N = 60 raters). More recent studies revealed that the attractiveness halo effect may not be smaller overall in collectivistic compared to individualistic cultures, but might differ in its exact manifestation. For example, on the one hand, 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. On the other hand, 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 previous findings within 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. Another study by Shaffer and colleagues (2000, N = 8 facial photos as

stimuli, N = 137 raters) found similar attractiveness halo effects for Taiwanese and U.S. American observers. Halo effects on communal attributes were not stronger compared to individualistic attributes in Taiwanese participants. In sum, there is still little consensus surrounding cross-cultural similarities and differences in the attractiveness halo effect for judgments based on facial stimuli.

Person perception based on bodies

Beyond faces, bodies signal crucial information in social encounters and hence play an important role in person perception. For example, while faces may have a somewhat stronger effect on overall perceptions of attractiveness than bodies (Currie & Little, 2009) and judgments of dominance have been shown to be more accurate based on faces compared to bodies (Rule et al., 2012), bodies may similarly influence perceptions of other attributes like sociability (Alicke et al., 1986). Also, compared to women, men are more likely to attempt to alter their bodies, as opposed to their faces, to augment their attractiveness (Coy et al., 2014). Furthermore, the perception of men's bodily dominance has a substantial positive effect on women's mate choice (e.g. Snyder et al., 2011). In intrasexually competitive contexts the assessment of men's appearance as cues to physical condition and dominance is central for deciding whether to compete with a given individual or not (Sell, Cosmides et al., 2009). The meta-analysis by Eagly and colleagues (1991) included 15 studies with full body stimuli (in the other studies, stimuli were faces or heads and shoulders), 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. A further study found a positive association between perceived attractiveness and dominance based on body avatars (also including heads) created from body scans (r = .45, N = 15 stimuli, N = 151 female observers, Coy et al., 2014). Later studies showed that bodily characteristics like the waist-to-chest ratio (WCR), upper body "V-shapedness", body mass index (BMI), and

the waist-to-hip ratio (WHR) simultaneously influence perceptions of attributes like attractiveness, health, and dominance (Coy et al., 2014; *N* = 24 figures as stimuli, *N* = 90 observers , Furnham et al., 1997; *N* = 50 bodily photos as stimuli, *N* = 82 observers, Swami et al., 2006; *N* = 50 bodily photos as stimuli, *N* = 30 observers, Tovée et al., 1999). Further research investigated stereotypes based on bodily characteristics such as weight. For example, one study showed that observers were more willing to engage in social, academic, and recreational activities with thin compared to overweight individuals (*N* = 274 observers, Greenleaf et al., 2006). In another study, an overweight job applicant was judged as less attractive and less suitable for a vacant position in organisation (*N* = 152 observers, Grant & Mizzi, 2014). Collectively, such indirect evidence would suggest considerable 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 & Tovée, 2005; Swami et al., 2006), a specific investigation of the halo effect for bodies is lacking so far.

One ornament hypothesis

Extant direct and indirect evidence suggests there should be similar halo effects for faces and bodies. This is underlined by empirical findings and theoretical reasoning that perceived attributes for different body parts are correlated. According to the *one ornament hypothesis*, different body parts comprise a single ornament signalling mate value, which has been hypothesized to be explicable by ontogenetic mechanisms of developmental stability manifested in body symmetry and, at least in women, involving hormonal variables (Thornhill & Grammer, 1999; Van Dongen & Gangestad, 2011). In line with this hypothesis, studies showed positive associations between targets' independently rated facial and bodily attractiveness (e.g. *r* = .49, *N* = 43 male targets, *N* = 52 female observers, Fink et al., 2010; *r* =

.52, *N* = 50 male and female targets, *N* = 13 male and female observers, Saxton et al., 2009; *r* = .30, *N* = 92 female targets, *N* = 20 male raters, Thornhill & Grammer, 1999). The study by Fink and colleagues (2010) further reported a positive association between perceived facial and bodily dominance (*r* = .53). While the one ornament hypothesis seems to be well established for attractiveness, it is unclear whether it robustly holds for further (bodily) fitness indicators like dominance or health (which could be hypothesized based on assumptions that bodily and facial characteristics affecting perceived dominance or health are similarly influenced by developmental stability and hormonal mechanisms, e.g. Foo et al., 2017; Kordsmeyer, Lohöfener, & Penke, 2019; Van Dongen & Gangestad, 2011), and whether it can be found for observers from a cultural background different to targets' background.

Aims and hypotheses

To tackle these unresolved questions, in this preregistered study different aspects surrounding the halo effect were investigated, engaging a cross-cultural perspective regarding observers' cultural backgrounds. Besides attractiveness, in our study we focused on three further attributes implicated in person perception and social interactions, namely dominance (which influences decisions whether to compete or avoid conflict with an individual, e.g. Stirrat & Perrett, 2010), prosociality (which is highly implicated in tendencies to trust and cooperate with an individual, e.g. Lee et al., 2017), and health (which, besides general effects on cooperativeness, crucially influences an individual's desirability as a mate and hence mate choice, e.g. Thornhill & Gangestad, 1999).

The first aim of this preregistered study (https://osf.io/q3kzf/?view_only=eb6d8f254e894298aab8570de7db7b9d; the preregistration contains further hypotheses besides those mentioned in the following, which are beyond the scope of this article) was to replicate the attractiveness halo effect and to examine further halo effects for men's faces, investigating associations between perceived attractiveness,

dominance, prosociality, and health. We hypothesised positive correlations between these four attributes (except for associations between perceived dominance and prosociality, which have been suggested to be 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 dominance may be weaker in Japanese compared to German observers (in line with Wheeler & Kim, 1997). Thirdly, we aimed to extend the few initial findings on the attractiveness halo effect for bodies only (omitting the head and face for an exclusive focus on the body), 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. Tovée et al., 1999; Swami et al., 2006), we hypothesised similar halo effects for bodies as for faces (and respective cross-cultural differences for observers). Finally, this study aimed to replicate and extend findings based on the one ornament hypothesis. We hypothesised positive associations between facial and bodily ratings for attractiveness, dominance, and health for observers from both an individualistic (Germany) and a collectivistic culture (Japan).

Methods

Data availability. The data and analysis script associated with this research are available at https://osf.io/k9fru/?view_only=c5bea4b089ed4911a04db01313aa73b6.

Facial and bodily stimuli. As part of a larger study involving further variables not relevant to this investigation (for details see Kordsmeyer & Penke, 2019 and Kordsmeyer et al., 2018), 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

metres, with the participants directly facing the camera (Canon EOS 350D) and asked to show 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; for more details see 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 (see 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, the final sample's 152 beauty turns were divided into two sets of 76 videos each matched for BMI to yield sets similar in both mean and variation of body composition. These two sets were rated by separate groups of (German) observers, while Japanese observers rated the full set, as outlined below. Sensitivity power analyses conducted using G*Power 3.1 (Faul et al., 2009) suggested that for faces a sample size of 164 would allow to detect a small-to-medium effect size of $\rho \geq .19$ with 80% power at $\alpha = .05$ (one-tailed for preregistered hypotheses, Cho & Abe, 2013; Lakens, 2016), and for bodies a sample size of 152 would allow to detect a small-to-medium effect size of $\rho \geq .19$ with 80% power at $\alpha = .05$ (one-tailed).

Figure 1. Screenshot of a beauty turn video used for the bodily ratings.

Observers. Overall 62 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 (96.4 % indicated to be students), 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 (100 % indicated to be students), judged target men's facial and bodily stimuli in separate groups of 10-12 observers (see below; small deviations of observer group sizes from the preregistered size of 10 are due to some rating data having been collected before the preregistration was published, 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. At first, observers saw a preview of the whole sample, with each picture being displayed for 0.5 sec., to provide a first impression of the target men's whole sample. Then, each observer 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 were instructed to watch a beauty turn until it had completed a full 360° turn, and turns were repeated until the observer made a choice. Observers initially watched a preview

with screenshots of the whole sample, with each beauty turn being displayed for 1 sec., to provide a general impression about the range of different body statures in this study. Each observer viewed the beauty turns in randomised order, one at a time and for as long as they wanted (after the first full turn), directly followed by the rating item (see below).

Ratings by German observers. Faces (photographs) and bodies (beauty turn videos) were rated for short- and long-term attractiveness (2 items: "How sexually attractive is this man?" and "How attractive for a romantic long-term relationship is this man?") and prosociality (aggregate of three items: "How trustworthy/kind/compassionate is this man?", Kogan et al., 2014) by the 62 German women in six groups of 10–12 observers each (1 group each for facial attractiveness and prosociality, 2 groups each for the 2 body stimuli sets) using 11-point Likert scales (ranging from -5 = "not at all attractive/trustworthy/kind/compassionate" to +5 = "very attractive/trustworthy/kind/compassionate"). The 61 German men rated target men's faces and bodies in six groups of 10–11 observers each (1 group rating both facial dominance and health, 1 group for facial prosociality, 2 groups (for the 2 body stimuli sets) rating both bodily dominance and health, 2 groups (for the 2 body stimuli sets) rating bodily prosociality; 1 item for dominance: "How likely would this man win a physical fight against another man?", 1 item for health: "How healthy is this man?"; same 3 items averaged as above for prosociality) on 11-point Likert scales (ranging from -5 = "not at all dominant/healthy/trustworthy/kind/compassionate" to +5 = "very dominant/healthy/trustworthy/kind/compassionate).

Ratings by Japanese observers. The same faces and bodies were each rated for global attractiveness (1 item: "How attractive is this man?"), health, and prosociality (same items as above for German observers) by the 60 Japanese women in six groups (the 3 attributes attractiveness, health, and prosociality rated by separate groups for faces and bodies, equalling 6 groups of raters overall) using the same 11-point Likert scales as above. Target men's faces

and bodies were each rated for dominance and prosociality (same items as above for German observers) by the 40 Japanese men in four groups (the 2 attributes dominance and prosociality for faces and bodies rated by separate groups) on the same 11-point Likert scales. Thus, the four attributes attractiveness, dominance, health, and prosociality were rated by separate groups of raters (except for groups of German men rating both dominance and health).

Statistical analyses. Bivariate Pearson correlations were calculated to examine associations between the main variables perceived attractiveness, dominance, prosociality, and health for both faces and bodies. Since short- and long-term attractiveness (rated by German women) were highly correlated (r = .96, p < .001), they were aggregated to achieve a more comparable measure to the Japanese women's global attractiveness ratings. 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 and for both faces and bodies). All analyses were performed using R (R Core Team, 2015). Since the study had been preregistered, 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 for differences in strengths of halo effects for young versus older faces) and target men's relationship status (binary: single vs. open relationships/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 with z-tests after Fisher's z transformation (Fisher, 1915). Additional analyses mentioned in the preregistration (e.g. on moderating effects

of body measures and facial measures) were omitted as they were beyond the scope of this article.

Results

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 are shown in Table 1. Overall, German and Japanese observers' ratings of faces and bodies were highly correlated (r = .29–.91, Table 1).

Table 1
Means and standard deviations of all facial and bodily ratings and correlations between German and Japanese observers.

	Japanese ratings				German ratings				Correlations	
	M	*SD*	*N*	*α*	*M*	*SD*	*N*	*α*	*r*	95% CI
Facial attractiveness	-0.62	1.16	10	.85	-1.35	1.43	12	.86–.87†	.65***	[.55, .73]
Facial health	0.10	1.55	10	.83	0.51	1.39	11	.84	.51***	[.38, .61]
Facial prosociality	0.12	1.22	20	.72–.87†	0.67	1.00	20	.69–.79†	.67***	[.57, .74]
Facial dominance	0.50	1.35	10	.71	0.40	1.43	11	.88	.72***	[.63, .78]
Bodily attractiveness	0.11	2.00	10	.94	-0.18	1.83	20	.88–.93†	.90***	[.87, .93]
Bodily health	-0.26	1.76	10	.93	0.57	1.80	20	.91–.95†	.91***	[.87, .93]
Bodily prosociality	0.27	0.79	20	.48–.82†	0.46	0.64	40	.26.–55†	.29***	[.14, .43]
Bodily dominance	-0.07	1.65	10	.89	0.37	1.67	20	.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, short- and long-term attractiveness, or two rating sets for bodies for German observers; 95% CI = 95% confidence intervals; ***p < .001 (one-tailed due to preregistered hypotheses).

Facial ratings. Correlations between the four attributes' ratings of faces, separately for Japanese and German observers, are depicted in Table 2. Facial attractiveness correlated positively with facial prosociality and facial health for both German and Japanese observers (Table 2). Facial health showed a positive association with facial prosociality for German and Japanese observers. Facial attractiveness was not significantly related to facial dominance for either German or Japanese observers (Table 2). Facial 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 *z*s < 1.94, *p*s > .054, see Table S3).

Table 2

Bivariate Pearson correlations between all attributes' facial ratings for German and Japanese observers.

	Attractiveness	Health	Prosociality	Dominance
Attractiveness		.55*** [.44, .65]	.56*** [.45, .66]	.08 [-.07, .23]
Health	.60*** [.49, .69]		.56*** [.44, .65]	.19** [.04, .33]
Prosociality	.60*** [.50, .69]	.69*** [.60, .76]		-.25*** [-.39, -.10]
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).

Bodily ratings. Correlations between the four attributes' ratings of bodies, separately for Japanese and German observers, are depicted in Table 3. Bodily attractiveness correlated positively with bodily health, dominance, and prosociality for both German and Japanese observers (Table 3). Bodily dominance was positively related to bodily health for both German and Japanese observers. Bodily health and 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 compared to

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 dominance (z = 4.66, p < .001, other unsigned zs < 1.41, ps > .080, see Table S6).

Table 3

Bivariate Pearson correlations between all attributes' bodily ratings for German and Japanese observers.

	Attractiveness	Health	Prosociality	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]
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).

One ornament hypothesis. Regarding intra-attribute correlations, all associations between facial and bodily ratings were positive and significant for both German and Japanese observers, with mostly small- to medium-sized effects (Table 4). That is, the bodies of target men with healthier, more attractive, and more dominant faces were on average perceived as healthier, more attractive, and more dominant, respectively. Exploratory analyses using z-tests after Fisher's z-transformations indicated that these intra-attribute correlations did not differ significantly for German versus Japanese observers (Table 4).

Table 4

Bivariate Pearson correlations between facial and bodily ratings, separately for German and Japanese observers, and differences between the two observer groups.

	German	Japanese	Difference (z)
Attractiveness	.42***† [.28, .55]	.30***† [.15, .44]	1.19
Health	.45***† [.31, .57]	.26***† [.10, .40]	1.89
Dominance	.44***† [.31, .56]	.27***† [.12, .41]	1.69

Note. 95% confidence intervals in square brackets; ***$p < .001$ (†one-tailed due to preregistered hypotheses), all *p*s for *z*-differences > .060 (two-tailed).

Discussion

The present study investigated cross-cultural differences and similarities in the attractiveness halo effect and in further halo effects for faces and bodies of German men for observers from an individualistic (German) and a collectivistic (Japanese) culture. We replicated and extended earlier findings on halo effects regarding associations between the attributes perceived attractiveness, prosociality, health, and dominance for faces, with similar associations for German and Japanese observers. Similar and 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 dominant by both German and Japanese observers. A further consistent halo effect was shown for dominance for bodies, but not faces: Bodies perceived as more dominant were seen as healthier, more prosocial (not by German observers), and more attractive. Exploratory analyses showed that halo effects for faces were of comparable strength for German and Japanese observers, but stronger for Japanese compared to German observers for bodies (e.g. associations of attractiveness with prosociality and health). Predictions derived from the one ornament hypothesis were supported by positive correlations between facial and bodily perceptions of attractiveness, health, and dominance.

For both German and Japanese observers, we found attractiveness halo effects on perceived health and prosociality, but not dominance (replicating earlier findings except for dominance, e.g. Boothroyd et al., 2013; Eagly et al., 1991; Langlois et al., 2000). Halo effects were also shown for further attributes. Healthy faces were perceived as more prosocial and dominant (the latter only by German observers, though it should be noted that dominance and health were rated by the same group of German observers, so that rater bias may play a role as well), while dominant faces were seen as less prosocial. The latter effect supports earlier

findings (e.g., Fruhen et al., 2015) and is in line with the hypothesis that dominance and trustworthiness (as a facet of prosociality, Kogan et al., 2014) are orthogonal dimensions of interpersonal perception (Oosterhof & Todorov, 2008). Overall, our results indicate that attractive and healthy faces elicit robust halo effects in both German and Japanese observers. This supports previous studies in that more attractive people are ascribed more positive attributes like social competence, intelligence, prosociality, health, and dominance (Bak, 2010; Boothroyd et al., 2013; Dion et al., 1972; Dion et al., 1990; Eagly et al., 1991; Engell et al., 2007; Langlois et al., 2000; Moore et al., 2011).

We further demonstrated halo effects for bodies as well, considerably extending the few extant studies, which mostly employed full body stimuli including head information (e.g. Eagly et al., 1991). We found consistent attractiveness halo effects for bodies (in line with Eagly et al., 1991), in that more attractive bodies were seen as healthier, more dominant, and more prosocial. This is in line with indirect evidence on observer perceptions' relationships with objectively measured bodily characteristics (Tovée et al., 1999; Swami et al., 2006). In contrast to the respective effects for faces, we present new evidence on a potential dominance halo effect for bodies only. Bodies with a more dominant appearance were perceived as healthier (though again it needs to be noted that dominance and health were rated by the same group of German observers), more attractive and prosocial (the latter only for Japanese observers). The positive association between perceived 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). Especially the former positive effect is unexpected, given that physically dominant men tend to be more aggressive (Sell et al., 2009, but see von Borell et al., 2019), and has not been shown in earlier research (Fruhen et al., 2015 found a significant inverse correlation for faces in a Western sample). This effect should be replicated, for example using observers from another collectivistic country besides Japan, to examine whether indeed dominant bodies are

seen as more prosocial within collectivistic cultures more generally. It may as well be a false positive, because interrater agreement (and agreement between German and Japanese observers) in ratings of bodily prosociality was considerably lower than for the other rated attributes for both German and Japanese observers. This might be explained by a difficulty to judge prosociality from bodily stimuli, questioning the robustness of the reported association. Hence, replication of the effects concerning bodily prosociality is required in general.

Overall, person perception of attractiveness and dominance based on bodies only (omitting information on the head) shows 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 (e.g. Thornhill & Grammer, 1999) and whether to compete with a focal individual or not (Sell, Cosmides et al., 2009). 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, arguably rendering the results more valid than perceptions based on static two-dimensional body photos (e.g. Sell, Cosmides et al., 2009). Since judgments were based primarily on morphology and information on skin colour and texture was lacking (which are relevant for health perceptions, for instance, Henderson et al., 2016), future studies should set out to replicate our results also focussing on these aspects.

In our study these halo effects were mostly consistent between German and Japanese observers. Explorative analyses revealed that some associations for bodies were stronger for Japanese compared to German observers, namely the associations of health with prosociality and attractiveness and of prosociality with attractiveness and dominance. These findings are partially in line with our hypotheses and earlier evidence (Shaffer et al., 2000; Wheeler & Kim, 1997). 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). On the contrary, the

stronger correlation between bodily attractiveness and dominance for Japanese observers is opposite to the earlier null effect for attractiveness and dominance for observers from a collectivistic culture, though these were based on facial photos (Wheeler & Kim, 1997). Future replication studies should specifically set out to assess whether the stronger association between attractiveness and dominance for observers from collectivistic versus individualistic cultures holds (or whether it was a false positive, in line with the earlier null finding). Generally, the strength of halo effects for faces was very similar between German and Japanese observers, while most halo effects for bodies were stronger for Japanese compared to German observers. At least for bodies, this may be interpreted as being in line with claims 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). This may lead to stronger convergence between attributes for observers from collectivistic cultures. The more holistic perception within collectivistic cultures may be more pronounced for bodies, because purportedly faces are more salient in face-to-face social interactions (as for instance indicated by faces more strongly influencing perceptions of attractiveness than bodies, Currie & Little, 2009), so that attributes can be differentiated more easily based on facial compared to bodily stimuli (especially taking into account that for our body stimuli information on skin colour and texture was lacking). This may at least partly explain the differences in halo effects between German and Japanese observers especially for bodies. Still, 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. Overall, 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, and may depend on cultural values (cf. Shaffer et al., 2000; Wheeler & Kim, 1997).

The halo effects and differences between observers from individualistic versus collectivistic cultures shown in this study may also be explained by cultural factors beyond an individualism-collectivism dimension. Three types of cultures have been distinguished, located in different parts of the world: dignity cultures (in which the inherent worth of equal individuals is stressed, mainly in Western European and North American countries), face cultures (marked by cooperativeness in settled hierarchies, in East and Southeast Asian countries), and honour cultures (in which both the internal and external worth of individuals is stressed, in the Middle East and Latin America, Aslani et al., 2013; Leung & Cohen, 2011). Since these types of cultures only partly overlap with the individualism-collectivism dimension (Aslani et al., 2013), cultural influences and hence specific manifestations of the halo effect may vary also within individualistic and collectivistic cultures based on different meanings of individual differences in these culture types (Leung & Cohen, 2011). For example, in honour cultures men protecting their families appear as dominant and may also be seen as attractive. On the contrary, in face cultures attractiveness may be more closely associated with characteristics linked with sociability, such as prosociality. In this study, for bodies the association between prosociality and attractiveness was particularly strong for Japanese observers (and stronger compared to German observers), whereas the correlation between dominance and attractiveness was clearly smaller (albeit still significantly positive). For faces, the link between attractiveness and prosociality was strongly positive for Japanese observers, whereas attractiveness and dominance showed a small negative correlation. These patterns underline the potential influences of cultural factors on differential halo effects for observers with individualistic versus collectivistic backgrounds and from dignity versus face cultures, for example. Further research should more closely investigate potential cultural influences, for example by comparing effects in observers from honour versus face cultures which would more generally be classified as collectivistic.

Within all cultures, a crucial question is whether these halo effects are valid in terms of predicting actual behaviour and other characteristics (e.g. do facially attractive individuals tend to behave more prosocially, but not in a more dominant way? Are attractive individuals healthier on average?), or whether they are indeed biases resulting in false stereotypes (as originally suggested by Thorndike, 1920). In line with recent claims that it is still unclear what exactly attractiveness signals (Jones et al., 2021), initial findings on the validity of these associations were mixed. A range of studies showed positive associations of observer-judged facial dominance and facial morphological measures consensually perceived as dominant with health measures (e.g. immune function, fewer past health problems, semen quality, Foo et al., 2017; Skrinda et al., 2014; Thornhill & Gangestad, 2006). On the other hand, associations of health measures with facial attractiveness were mostly non-significant (e.g. Foo et al., 2017; Hume & Montgomerie, 2001; Skrinda et al., 2014; Thornhill & Gangestad, 2006; for a review showing weak effects in women and mostly null findings in men see Weeden & Sabini, 2005). Moreover, morphological measures of facial dominance were inversely related to trustworthy behaviour in trust games or negotiations (e.g. Haselhuhn & Wong, 2012; Stirrat & Perrett, 2010). In contrast, a further study showed no significant correlations of reciprocal prosocial behaviour in a social dilemma game with a morphological measure of facial dominance or observer-perceived facial attractiveness (Efferson & Vogt, 2013). The halo effects detected in our study are mostly in line with these findings. Perceived facial dominance was inversely correlated with prosociality, and positively with health (German observers only), whereas perceived attractiveness was strongly positively associated with health and prosociality (both contrary to the earlier null findings reported above). Regarding bodies, a study showed a positive correlation between perceived attractiveness and objectively measured strength (Sell et al., 2017), which concords with the positive association between perceived attractiveness and dominance in our study. A further study failed to find a significant link between women's perceived bodily attractiveness and a health measure (cardiovascular fitness, Smith et al., 2007),

contrary to the strong positive correlations between men's perceived attractiveness and health in this study. Thus, it seems that some of the halo effects may have partial external validity, though these associations need to be examined further (e.g. clarifying the links of dominant facial appearance with health measures and prosocial behaviours, investigating dominant behaviour predicted by facial attractiveness, and studying further health measures in association with bodily perceptions).

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 dominance, but also health and attractiveness to women (Boothroyd et al., 2007; Thornhill & Gangestad, 1999). One component of facial masculinity is the facial width-to-height ratio (fWHR, Dixson, 2021). Earlier studies have shown fWHR to predict 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 should be related to both health and dominance perceptions (e.g. Rhodes et al., 2003). Further characteristics influencing perceptions are facial symmetry and averageness, which have been linked to both facial attractiveness and health (e.g. Foo et al., 2017), and men's beardedness, which has been shown to predict perceived attractiveness and dominance (Dixson et al., 2016; Neave & Shields, 2008). Concerning bodies, in earlier studies characteristics such as waist-to-chest ratio, upper body "V-shapedness", body mass index, and waist-to-hip ratio influenced men's perceived attractiveness, dominance, and health (e.g. Coy et al., 2014; Furnham et al., 1997; Kordsmeyer, Stern, & Penke, 2019; Tovée et al., 1999; Swami et al., 2006). 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 set out to examine these cues and their moderating effects on halo effects in more detail.

Our findings of correlated perceptions of facial and bodily attractiveness and dominance support initial studies in line with the one ornament hypothesis (e.g. Fink et al., 2010; Saxton et al., 2009; Thornhill & Grammer, 1999), and further underline that men's faces and bodies can be seen as a single ornament honestly signalling mate quality (e.g. Fink et al., 2010). The new evidence for perceived health can be interpreted similarly, with health being a desirable attribute in potential mates (e.g. Kenrick et al., 1990). One may ask why exactly these independent ratings of faces and bodies are relatively strongly associated. Previous speculations alluded to ontogenetic mechanisms manifested in body symmetry (Thornhill & Grammer, 1999), or general masculinity ascribed to hormonal, ontogenetic, and immunological mechanisms (Fink et al., 2010). The latter mechanisms may especially apply to perceived dominance and consequently male attractiveness, in that muscularity may be manifested in both the face and the body and hence explain associated perceptions. Correlated health ratings may be explicable by visible cues to immune functioning and ontogenetic mechanisms such as symmetry (Thornhill & Grammer, 1999). These findings suggest exciting avenues for future studies to pinpoint which cues and characteristics can explain these correlated perceptions for faces and bodies (sensu the one ornament hypothesis), to examine further modalities like voices (e.g. Feinberg, 2008), and also to investigate these effects involving the further attributes in women (as in Saxton et al., 2009 and Thornhill & Grammer, 1999 for attractiveness).

Some limitations to our findings need to be acknowledged. Firstly, as a central limitation, this study included male targets only, thus limiting 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 set out to examine these associations for female targets, replicating these findings and extending them by employing bodily stimuli.

Also, facial and bodily stimuli only from one culture (Western European) were used, so that German observers judged target men with an identical cultural background, but Japanese judged men from a different cultural background, due to a lack of Japanese stimuli available. 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 compared to faces from other ethnic groups (e.g. Tanaka et al., 2004). However, interrater agreements were very similar for German and Japanese observers (even somewhat higher for facial dominance for Japanese observers, but lower for bodily prosociality), suggesting that at least within the groups of Japanese observers the agreement was comparable to German groups of observers. Still, future studies should employ and 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. It seems that particularly for bodies the three items on trustworthiness, compassion, and kindness were more difficult to judge, particularly for bodies. This is in line with an earlier finding in which interrater reliabilities were considerably lower for perceived facial trustworthiness compared to 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 et al., 2019), that is also more readily perceivable from facial and bodily stimuli. Hence, it would be interesting to

investigate halo effects and respective cross-cultural differences for other components of dominance, such as social dominance (e.g. Qu et al., 2017). Similarly, concerning attractiveness, the items used differed between Japanese and German observers. Whereas Japanese observers answered one item on global attractiveness, German observers judged short- and long-term attractiveness (i.e. more pertaining to sexual attractiveness). Although attractiveness judgments of German and Japanese observers were strongly positively correlated, future studies should examine nuances in halo effects depending on the specific definition and judgment of attractiveness (e.g. Eagly et al., 1991). Finally, besides faces and bodies further modalities could be investigated, such as voices, to extend the halo effects shown in this study. Previously, associations between perceived attractiveness and dominance, amongst others, 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 (such as fundamental frequency), 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 greatly extends earlier findings on halo effects as a persistent cognitive bias in person perception. New evidence is presented for a dominance halo effect for bodies, but not faces. These halo effects became apparent in observers from both collectivistic (Japanese) and individualistic (German) cultures not only for targets' faces, but also their bodies. For bodies some of these halo effects were stronger for Japanese compared to German observers. Moreover, in line with the one ornament hypothesis, the bodies of men with healthier, more attractive, and more dominant faces were perceived as healthier, more attractive, and more dominant. In conclusion, this study further underlines strongly associated perceptions in both collectivistic and individualistic cultures amongst attributes playing a crucial role in person perception, which should have far-reaching implications for social interactions.

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Table S1

Partial correlations between facial ratings for German and Japanese observers, controlling for target men's age and relationship status.

	Attractiveness	Health	Prosociality	Dominance
Attractiveness		.55***	.57***	.12
Health	.59***		.56***	.20*
Prosociality	.61***	.65***		-.25**
Dominance	-.08	.00	-.22**	

Note. Japanese correlations are in the bottom-left, German correlations are in the top right half; relationship status: 1 = single, 2 = vs. open or committed relationship/engaged/married; *p < .050, **p < .010, ***p < .001, other ps > .140; N = 164.

Table S2

Bivariate Pearson correlations between facial ratings for German and Japanese observers applying a Benjamini-Hochberg correction for multiple testing.

Bivariate correlations and p-values	Attractiveness	Health	Prosociality	Dominance
Attractiveness		.55***	.56***	.08
Health	.60***		.56***	.19*
Prosociality	.59***	.63***		-.25**
Dominance	-.09	-.01	-.21*	

Note. Japanese correlations are in the bottom-left, German correlations are in the top right half; *p < .050, **p < .010, ***p < .001, other ps > .363; N = 164.

Table S3

Differences (z) between German and Japanese observers in bivariate Pearson correlations between all attributes' facial ratings.

	Attractiveness	Health	Prosociality
Attractiveness			
Health	0.67		
Prosociality	0.54	1.93	
Dominance	-1.53	-1.82	0.84

Note. All ps > .054 (two-tailed).

Table S4

Partial correlations between bodily ratings for German and Japanese observers, controlling for target men's age and relationship status

	Attractiveness	Health	Prosociality	Dominance
Attractiveness		.90***	.19*	.45***
Health	.94***		.11	.45***
Prosociality	.70***	.68***		.01
Dominance	.32***	.38***	.50***	

Note. Japanese correlations are in the bottom-left, German correlations are in the top right half; relationship status: 1 = single, 2 = vs. open or committed relationship/engaged/married; *p < .050, ***p < .001, other ps > .180; N = 152.

Table S5

Bivariate Pearson correlations between bodily ratings for German and Japanese observers applying a Benjamini-Hochberg correction for multiple testing.

Bivariate correlations and p-values	Attractiveness	Health	Prosociality	Dominance
Attractiveness		.90***	.17	.44***
Health	.94***		.10	.43***
Prosociality	.70***	.68***		.01
Dominance	.30***	.37***	.50***	

Note. Japanese correlations are in the bottom-left, German correlations are in the top right half; *p < .050, **p < .010, ***p < .001, other ps > .062; N = 152.

Table S6

Differences (z) between German and Japanese observers in bivariate Pearson correlations between all attributes' bodily ratings.

	Attractiveness	Health	Prosociality
Attractiveness			
Health	2.29*		
Prosociality	6.00***	6.29***	
Dominance	-1.40	-0.62	4.66***

Note. *p < .050, ***p < .001, other ps > .080 (two-tailed).