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The Power of Pictures: Vertical Picture Angles in Power Pictures

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Conventional wisdom suggests that variations in vertical picture angle cause the subject to appear more powerful when depicted from below and less powerful when depicted from above. However, do the media actually use such associations to represent individual differences in power? We argue that the diverse perspectives of evolutionary, social learning, and embodiment theories all suggest that the association between verticality and power is relatively automatic and should, therefore, be visible in the portrayal of powerful and powerless individuals in the media. Four archival studies (with six samples) provide empirical evidence for this hypothesis and indicate that a salience power context reinforces this effect. In addition, two experimental studies confirm these effects for individuals producing media content. We discuss potential implications of this effect.

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Throughout history, humans have utilized both verbal and nonverbal cues to establish and reinforce power structures. Although verbal means such as commands and speeches are the most obvious displays of power, nonverbal means such as interpersonal distance and body postures can equally serve to communicate and establish power relations (Hall, Coats, & Smith LeBeau, 2005; Tiedens & Fragale, 2003). In this realm, cues of order in space, such as size and elevation, seem to be especially important (Fiske, 2004; Giessner & Schubert, 2007).

Today, people's attitudes toward, and judgments about, others are heavily influenced by the way they are portrayed in the media and in art (Arnheim, 1957; Livingston, 1958; Messaris, 1994; Tiemens, 1970; Zelizer, 2004). Conventional wisdom suggests that media subtly influence power perceptions via nonverbal cues, and make use of nonverbal cues to corroborate the power of the depicted subject (Mandell & Shaw, 1973; Tiemens, 1970). Yet, there is only partial scientific evidence for these assumptions.

The current studies were designed to demonstrate how the power of a given person, in combination with the salience of power in the context, systematically influence how vertical picture angle is used to depict this person, thus, creating an illustration that reinforces this power. In testing our assumption by means of archival media material and experimental studies, we seek to extend previous research and show how simple cognitive associations can impact on the media content we consume in our everyday life.

VERTICALITY AND POWER JUDGMENTS

Previous research has demonstrated that vertical picture angles influence power perceptions. Mandell and Shaw (1973) presented simulated newscast videos that varied in vertical picture angle. Participants evaluated the target person as more powerful if presented from below compared to from above. A more recent study by Mignault and Chaudhuri (2003) presented participants with pictures of three-dimensional modeled faces depicted from seven vertical angles. Participants evaluated each picture for submissiveness versus dominance. The results yielded support for the association between vertical picture angle and power perceptions. Similarly, Kraft (1987) showed a series of slide stories in which two characters were depicted from three vertical angles (above, below, frontal). For example, in one of these slide stories, participants saw a woman asking a man to put out his cigarette. Kraft showed that participants' evaluation of how dominant the man or woman appeared depended on the vertical angle.

Explanations for why the verticality of a picture angle should be related to power judgments come from a diverse range of theories including evolutionary approaches, learning theory, and embodiment theories (Giessner & Schubert, 2007; Schubert, Waldzus, & Seibt, 2011). Evolutionary theories con-

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tend that physical height often serves as a cue for strength and formidability (Freedman, 1979), and that as a result there is an instinct-driven association between height and dominance that has functional value for many animal species—both to identify chances to dominate and to identify utility of submission (Archer, 1988; Parker, 1974). Vertical picture angles may suggest a difference in body height (and, thus, strength and dominance) between the depicted person and the perceiver, who places himself or herself at the center of projection (Kubovy, 1986).

Another explanation for the association between picture angle verticality and power judgments stems from theories that argue that such associations are learned. For example, children are confronted by taller parents whom they look at from below, and who have power over them (Schwartz, 1981; Schwartz, Tesser, & Powell, 1982). Experiences with situations where height and power are associated continue throughout life. Individuals often use their physical height advantage to gain power (Felson, 2002). Winners of competitive events traditionally stand on top of a podium, organizations use tall buildings to represent their power and economic success, and the economic status of organizations is tracked by the rise and fall of stocks. Moreover, the relationship between physical height and power has a significant impact on our lives. For instance, taller persons on average attain higher job status (Egolf & Corder, 1991; Melamed & Bozionelos, 1992), earn higher salaries, and emerge more frequently as leaders (Judge & Cable, 2004). All in all, such relationships create a social context where powerful people tend to be tall and elevated, further reinforcing the association between power and physical height (Schwartz et al., 1982).

Finally, embodiment theories of cognition provide theoretical and empirical support for a generalized relationship between verticality and power perceptions. Such theories are based on recent advances in cognitive psychology demonstrating that humans ground their conceptual thinking perceptually (Barsalou, 1999; Glenberg, 1997; IJzerman & Koole, 2011), such that mental representations of concepts, even abstract ones, are tied to a perceptual basis (Barsalou, 2008; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005). In other words, people's mental representations of abstract concepts (like power) are embodied in modal information about space and the body. This embodied view of cognition has been used to explain how power is mentally represented arguing that thoughts about power are automatically connected to a vertical dimension in space (Schubert, Waldzus, & Seibt, 2008, 2011). In this way, when people think about power, they automatically interpret "up," "above," and "large" as cues for power, and "down," "below," and "small" as cues for powerlessness (Giessner & Schubert, 2007; Lakens, Semin, & Foroni, 2011; Meier & Dionne, 2009; Meier, Hauser, Robinson, Friesen, & Schjeldahl, 2007; Schubert, 2005; Schubert, Waldzus, & Giessner, 2009; Zanolie et al., in press; van Quaquebeke & Giessner, 2010).

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All of these associations are also reflected in our use of language (Schwartz, 1981). Indeed, people often use metaphors that connect power with verticality when we communicate about powerful persons (e.g., high status, top management, superiors) and powerless persons (e.g., low status, subordinates). Accordingly, the metaphorical use of language corroborates the argument that the cognitive system mentally represents the concept of power on a vertical dimension (Landau, Meier, & Keefer, 2010; Lakoff & Johnson, 1990).

USE OF VERTICAL PICTURE ANGLES TO REPRESENT POWER

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Given the rich theoretical and empirical foundations of cognitive associations between verticality and power judgments, it is reasonable to assume that variations in picture angle should be utilized when powerful or powerless individuals are portrayed in the media. Thus, with this article, we seek to investigate whether and when the media make use of picture angle to represent power.

Surprisingly, apart from anthropological fieldwork (e.g., Fiske, 1991; Toren, 1999), there is little research on the use of such cues in practice. We are aware of only a few empirically restricted studies. First, there is case evidence of the use of vertical picture angle in visual media to represent power (Messaris, 1992, 1994; Kepplinger, 1991). Second, Fahmy (2004) analyzed Associate Press (AP) photographs of Afghan women before and after the fall of the Taliban regime. She found that, on average, the camera angles changed from a downward perspective to a frontal perspective, reflecting the increased status of the Afghan women as a result of the regime change. Although this study provides some evidence for our reasoning, it is unfortunately not conclusive due to a) the highly specific context, b) a sole focus on rather powerless people, c) only marginal significant results, and d) an unclear theoretical framework regarding the conditions under which the association between vertical picture angle and power may or may not be present.

To address these limitations, we will test two related hypotheses, and we do so in two different arenas of research. First, we seek to demonstrate that existing media make consistent use of vertical picture angles when the context in which individuals are portrayed addresses power-related aspects, such that powerful persons are more likely to be portrayed from below and less powerful persons are more likely to be portrayed from above (Hypothesis 1). If, however, media present photos of potentially powerful persons in contexts that are not about power, for example, where social information or just pure knowledge is portrayed, vertical picture angles should be of less importance. Therefore, we predict that vertical picture

angles are especially utilized to portray the power of a target person if power is salient (Hypothesis 2). In other words, we expect the association of power and vertical cues to be moderated by social context.

Formulating the hypotheses in this manner predicts a difference in actual media representations. However, we also wish to test the hypotheses in relation to individuals producing media content. Thus, we also test whether individuals are more likely to portray powerful targets with photos depicted from below, compared to less powerful targets (again Hypothesis 1). Furthermore, the use of the vertical angle should again be more pronounced in salient (vs. nonsalient) power contexts (Hypothesis 2). Thus, we test our prediction that the power of a target influences its depiction using vertical picture angles in both actual media content and in (lay people's) content production.

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OVERVIEW AND RATIONALE OF THE CURRENT STUDIES

We conducted six studies to test our hypotheses. The first four studies (with a total of six samples) are archival in nature and investigate actual media content, while the final two studies are experimental and investigate individual behavior.

For Studies 1a and 1b, we examined two different sets of pictures that represent powerful individuals: "The *Time* 100: The people who shaped our world" (n.d.) and "The *Time* 100: The most important people of the century" (n.d.). For each individual on these lists, *Time* magazine publishes a picture. We chose these picture sets because they overtly aim to represent individuals as being powerful. In other words, individuals portrayed in these pictures are presented in a context in which power is salient. Given that these individuals have been chosen as the most influential persons in their fields, we would expect that they are perceived as powerful and, therefore, that the pictures of them would, on average, be depicted from below.

Because the *Time* lists depict only powerful individuals, we conducted Study 2 to contrast powerful and nonpowerful individuals. We used pictures from World Press Photo (2007), a collection of the world's most prestigious annual press photography. Many of these pictures capture scenes of wars or catastrophe and, thus, depict individuals in both situations of powerlessness and power.

To increase the potential generalizability of results, we made use of the CORBIS database in Studies 3a and 3b. The CORBIS database is a resource for advertising, marketing, and media professionals, providing a comprehensive selection of photography and illustration. Internet, newspapers, books, television, and films make use of pictures from this Web site. It has a collection

of over 100 million images. In other words, it is a representative Web site for media pictures. Using this Web site, we tested whether persons found using powerful or powerless search terms (via the search engine) are more often portrayed from below or above. In sum, the first five samples provide a variety of media sources to test Hypothesis 1.

Study 4 directly contrasted pictures of given individuals in power-related versus less power-related contexts. We used a picture dataset from the *Time* Web site, "The 2009 *Time* 100—The World's Most Influential People," and compared them with the pictures of the same individuals on Wikipedia (a Web-based, multilingual, free encyclopedia) and Facebook (a social network service). Our reasoning is that both Wikipedia and Facebook represent media contexts in which the power of portrayed persons is not the central focus. Wikipedia is produced by voluntary users with a primary aim to collect relatively "neutral" knowledge and make it freely available to a wide audience. Similarly, Facebook is a social network with the aim to facilitate contacts between users. Therefore, we test Hypothesis 2 by comparing "The 2009 *Time* 100" pictures, which purposely portray powerful persons with the more neutral pictures presented on Wikipedia and Facebook.

Finally, two experimental studies test the extent to which individuals are influenced by the association between power and vertical angle when choosing pictures. In Study 5, we examine how target power influences the choice of pictures varying in vertical picture angle. Finally, in Study 6 we manipulate the salience of the power context while keeping target power constant.

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STUDY 1a

Materials and Method

We downloaded the pictures of "The *Time* 100—The people who shaped our world, 2006" from the *Time* magazine Web site. The pictures are divided into five categories (artists and entertainers, builders and titans, heroes and pioneers, leaders and revolutionaries, scientists and thinkers) and we presented them separately to two professional photographers in a random order on a computer screen. The photographers were unaware of the nature of pictures they had to evaluate. Their task was to estimate the angle from which each picture was depicted on a scale from 3 (= *above*) to −3 (= *below*). We presented this scale vertically on the right side of each picture. We averaged the scores, $r(98) = .60$, ICC = .67.[1]

Additionally, we coded the pictures for the number of people in the picture (85 depicted one person, 15 depicted more than one person), the kind of picture (81 were photographs, 19 were paintings), and the gender of

the target person (75 men, 25 women). Preliminary analyses indicated that neither the five categories, $F(4, 95) = .50$, $p = .74$, $\eta_p^2 = .02$, the number of people depicted, $t(98) = 1.07$, $p = .29$, $d = .21$, the kind of picture, $t(98) = 1.25$, $p = .22$, $d = .25$, nor the gender of the target person, $t(98) = .95$, $p = .35$, $d = .19$, had a significant impact on picture angle.

Results

A t test comparing the estimated picture angle to 0 (i.e., frontal) yielded a significant result, $t(99) = -5.87$, $p < .001$, $d = .59$. The professional photographers judged that, on average, the pictures had been depicted from below ($M = -.86$, $SD = 1.47$).

STUDY 1b

Materials and Method

We followed the same procedure used in Study 1a, with the pictures from the "The *Time* 100—The most important people of the century, 2006" collection. Again, we used the average verticality scores of the photographers, $r(98) = .77$, ICC = 87.

As in Study 1a, the pictures were divided into five content categories and coded for the number of people in the picture (87 depicted one person, 13 depicted more than one person), the kind of picture (99 were photographs, 1 was a painting), and the gender of the target person (84 men, 16 women). Again, the unit of analysis in this study was the picture. Preliminary analyses indicated that neither the five content categories, $F(4, 95) = 1.50$, $p = .21$, $\eta_p^2 = .06$, the number of people depicted, $t(98) = -1.46$, $p = .15$, $d = .29$, nor the gender of the target person, $t(98) = .49$, $p = .31$, $d = .10$, had a significant impact on picture angle. We could not test for kind of picture, as there was only one painting. However, excluding this picture from analyses did not change the main results.

Results

A t test comparing the estimated picture angle to 0 (i.e., frontal) yielded a significant result, $t(99) = -4.56$, $p < .001$, $d = .46$. The professional photographers judged that, on average, the pictures had been shot from below ($M = -.44$, $SD = .95$).

Discussion

Both samples support our Hypothesis 1 that powerful people are more likely to be portrayed from below than from above. An obvious shortcoming of the

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studies so far is that these picture data sets do not allow us to test whether low power individuals are more likely to be portrayed from below. To test for this, we made use of the World Press Photo from 2007. Using this picture set allowed us to contrast pictures depicting powerful individuals with pictures depicting powerless individuals. If our predictions are correct, we should find that, on average, vertical picture angle will correspond to the power of the portrayed individuals.

STUDY 2

Materials and Method

Two professional photographers evaluated pictures from the World Press Photo (2007) yearbook across five different categories (spot news, general news, people in the news, contemporary issues, and daily life). We provided the book and a questionnaire to the photographers. Their task was to evaluate the angle from which the central scene of each picture was shot, on a scale from 3 (= *above*) to −3 (*below*). Altogether, the photographers evaluated 101 pictures. We averaged the scores, $r(99) = .85$, ICC = 91.

We also asked three other raters (i.e., Ph.D. students who were unaware of the hypotheses and did not engage in photography as a hobby or a profession) to evaluate whether the intent of each picture was to represent a) powerfulness, b) powerlessness, or c) whether it was neutral or unclear, through a forced-choice item. They first rated the pictures individually and, where there was disagreement, discussed those decisions and reached a consensus. Initial disagreement occurred for nine pictures (in which at least one rater deviated for the others). The raters agreed to place eight of these pictures in question into the neutral or unclear category and one picture in the category powerful. Thus, the raters agreed that 46 pictures portrayed a powerless situation and 12 pictures portrayed a powerful situation. For 43 pictures, the raters concluded that the intention of the picture was neutral or unclear.

Additionally, we coded the pictures for whether they actually included people (85 pictures depicted people, 16 did not) and whether children were depicted in the picture[2] (21 pictures portrayed children with adults; 80 pictures did not portray children). We included only the 85 pictures with people in our analysis. Note, however, that preliminary analyses indicated no significant difference for picture angle comparing pictures with persons with pictures without persons, $t(99) = 1.02$, $p = 31$, $d = .21$. Additional preliminary analyses indicated that neither the categories of the World Press Photo (2007) yearbook had a significant impact on the angle judgments, $F(4, 80) = 1.36$, $p = .25$, $\eta_p^2 = .06$, nor did having children (vs. no children) in the picture, $t(83) = -.98$, $p = .33$, $d = .20$.

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TABLE 1 Study 2: Picture Choices

Picture power context	*N*	*M*	*SD*
Powerful	9	$-.44^{b}$	.67
Neutral/unclear	35	$.61^{b}$	.23
Powerless	41	1.30^{a}	.22

Note. The final number of pictures per power context is represented by *N*. Means above 0 represent angles from above and means below zero represent an angle from below (scale −3 to 3). Different superscripts indicate a significant difference in simple comparisons with Bonferroni adjustment.

Results

A one-way analysis of variance (ANOVA) on the judgments of picture angle with picture intent as the factor yielded a significant effect of the intercept, $F(1, 82) = 6.31$, $p = .01$, $\eta_p^2 = .07$. The professional photographers judged the pictures as being on average shot from above ($M = 1.07$, $SD = .95$). More importantly, however, the analysis yielded a significant main effect of picture intent, $F(2, 82) = 6.07$, $p = .003$, $\eta_p^2 = .13$. Those pictures representing powerless situations were, on average, rated as being shot from above whereas those pictures representing powerful situations were, on average, rated as being shot from below (see Table 1). As expected, the mean for picture angle of the pictures in which the central scene was neutral or unclear was in between the two other means.

Discussion

Study 2 yielded further support for Hypothesis 1. Using a more varied picture data set and contrasting powerful and powerless individuals, we could demonstrate that powerless individuals are, on average, portrayed with an angle from above whereas the opposite is true for powerful individuals. We aim to confirm this effect in the following study using a larger picture dataset which also includes prejudged information on the picture angle (below vs. above) used in the target pictures.

STUDY 3a

Materials and Method

We made use of the CORBIS database (see http://www.corbisimages.com/). Each photo includes a variety of information, including "point of view" with the categories: aerial, close-up, above, below, and from space. Hence, the Web site can distinguish between pictures depicted from above or below. We then searched for pictures using 18 different powerful group descriptors (e.g., lawyer, manager, professor) and 18 powerless group descriptors

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TABLE 2 Study 3a: Group Labels and CORBIS Percentages of Pictures with an Angle from Below

Powerful		Powerless	
Group label	Percentage	Group label	Percentage
chief	66.67	maid	56.00
lawyer	65.71	servant	53.33
inspector	52.17	secretary	35.14
minister	56.52	pupil	48.78
master	44.83	victim	13.95
priest	82.86	patient (medical)	26.37
policeman	56.25	handicapped person	52.08
professor	57.14	labourer	52.70
attacker	74.55	tea lady	22.44
president	72.73	sick person	25.87
politician	81.82	help	58.33
entrepreneur	48.76	elderly person	52.81
officer	70.97	assistant	51.54
boss	73.33	cleaning lady	22.42
leader	69.82	student	51.16
physician	66.77	baby	25.31
manager	68.33	citizen	60.95
businessman	62.99	worker	57.07

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(e.g., secretary, pupil, assistant; see Table 2) adapted from Schubert (2005) and Zanolie et al. (in press). We limited the search for pictures with one person and recorded how many pictures were stored in the database that are depicted from below and from above for each of the group descriptors. This search was conducted on November 11, 2010, with pictures dating back one year.[3] As the results of this search varied greatly in number (from 21 to 4,107), we calculated the number of pictures taken from below as a percentage of the total number of pictures. As a comparison, the number of pictures depicting one person below and above for the entire database in this search period was 8,018 and 7,623 (equaling a total of 15,641) resulting in a baseline percentage of 51.26—thus, nearly equaling 50%.

Results

A *t* test between the pictures found using the powerful and powerless group descriptors yielded a significant difference for picture angle, $t(34) = 5.07$, $p < .001$, $d = 1.74$. Pictures found using powerful descriptors were more often depicted from below ($M = 65.12$, $SD = 10.70$) compared to pictures of powerless descriptors ($M = 42.57$, $SD = 15.54$). Both powerful and powerless pictures significantly differed from 50%, such that powerful pictures were, on average, taken from below, $t(17) = 25.42$, $p < .001$, and powerless pictures were, on average, taken from above, $t(17) = 11.35$, $p < .001$.

STUDY 3b

Materials and Method

Again we used the CORBIS Web site search options to gather data. Instead of focusing on various powerful and powerless group descriptors, we aimed to test comparable groups that differ in perceived power and status. The most general group differing in perceived status or power is certainly gender (Goodwin & Fiske, 2001). The stereotype of men is related to dominance and strength whereas the stereotype of women is related to submission and weakness. As a result, vertical cues, such as picture angle, should be related to these groups.[4] Therefore, we searched for pictures of men and women using the same procedure used in Study 3a.

Results

A Pearson chi-square test indicated that observed choices significantly differ from the expected choices, $\chi^2(1) = 184.57$, $p < .001$, $\varphi = .12$. As expected, men were more often portrayed from below than above (see Table 3; 60.51% from below), $z = 15.90$, $p < .001$ (one-sample z-test comparing to a 50% distribution). In contrast, women were more often portrayed from above, although less pronouncedly (48.09% from below), $z = -3.24$, $p < .001$ (one-sample z-test comparing to a 50% distribution).

Discussion

Again, these studies confirm Hypothesis 1. Powerful individuals are more likely portrayed from below than above. In contrast, powerless individuals are more likely portrayed from above than below. In Hypothesis 2, we predict that vertical angles will be more likely to be used in a context where power is salient, compared to when it is not. Study 4 aimed to test this prediction with another picture data set from the *Time* magazine Web site and matched picture data sets from Wikipedia and Facebook fan pages.

TABLE 3 Study 3b: CORBIS Search Results

	Picture angle		
Gender	Above	Below	Total
Man	2251 (2633)	3398 (3061)	5649
Woman	3735 (3353)	3460 (3842)	7195
Total	5986	6858	12844

Note. Expected frequencies are in parentheses.

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STUDY 4

Materials and Method

We downloaded the pictures of "The 2009 *Time* 100—The World's Most Influential People" from the *Time* Web site. These pictures were divided in five categories (artists and entertainers, builders and titans, heroes and icons, leaders and revolutionaries, scientists and thinkers). Preliminary analyses indicated again that these categories did not have a significant impact on evaluated picture angle, $F(4, 95) = 1.87$, $p = .12$, $\eta_p^2 = .07$.

Pictures were presented separately in a random order on a computer screen. Seventeen students estimated the angle from which each picture was depicted on a scale from 3 (= *above*) to −3 (= *below*), ICC = .91, and an average score was created. In a second step, we searched Wikipedia (English version) for the individuals included in the 2009 *Time* 100 list. For each individual we downloaded (January 14, 2010) the pictures presented on the top right-hand side of the Web page in Wikipedia. Because some individuals from the *Time* magazine were not represented in Wikipedia, or did not have a picture provided on the Wikipedia Web site, we could only gather a sample of 73 pictures from Wikipedia. Again we randomly presented these pictures on a computer screen to another seventeen students who were asked to estimate the picture angle, ICC = .96. The average picture angle score was used in our analysis. Finally, we downloaded (January 12, 2011) profile-pictures of the *Time* 2009 individuals from their official Facebook fan pages. As with Wikipedia, some persons did not have a fan page or did not have a picture. Furthermore, some persons had a Facebook fan page that exactly mirrored the Wikipedia site. These fan pages were not considered (final $N = 62$). For some individuals there were more than one fan page and it was unclear which page was the official fan page. For these cases, we downloaded the profile pictures from the two fan pages with the most fans and computed an average score. Eighteen students evaluated the randomly presented pictures on a computer screen, ICC = .90 and the average score was used in our analysis.

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Results

To first compare the *Time* 2009 picture set with the results from our Studies 1a and 1b, we conducted a *t* test comparing the estimated picture angle to zero. Again, and in support of Hypothesis 1, on average, pictures were depicted from below, $t(99) = -8.19$, $p < .001$ ($M = -.46$, $SD = .57$).

Second, in a repeated measure analysis of variance, we compared the picture angles of the *Time* 2009 pictures with the picture angles of the Wikipedia pictures and of the profile pictures from the Facebook fan pages. This analysis was conducted for the 54 individuals for which there were both

Wikipedia and Facebook photos. The analysis yielded a significant effect of the source of pictures, $F(2, 52) = 3.76$, $p = .03$, $\eta_p^2 = .13$. As expected, the pictures of *Time* 2009 yielded a more extreme angle from below ($M = -.48$, $SD = .55$) than the pictures from Wikipedia ($M = -.38$, $SD = .73$) and Facebook ($M = -.16$, $SD = .68$).

As the repeated measures ANOVA only allows for a restricted subsample, we also tested for significant difference between the picture angles of *Time* 2009 and Wikipedia using the matched 73 pictures and *Time* 2009 and the Facebook fan pages using the 62 matching pictures. The pictures set of the *Time* 2009 were shot from a lower angle than the pictures of Wikipedia, $t(72) = -2.02$, $p = .047$. Similarly, the pictures from *Time* 2009 were shot from a lower angle than the ones from Facebook, $t(61) = -3.11$, $p = .003$. Overall, the average picture angle from *Time* 2009 as well as the average picture angle from Wikipedia were significantly different from zero (*Time* 2009, $t(72) = -7.60$, $p < .001$; Wikipedia, $t(72) = -2.72$, $p = .008$). The pictures from Facebook were not significantly different from zero, $t(61) = -1.66$, $p = .10$.

Discussion

Study 4 supports our Hypothesis 2, namely, that the association between the use of vertical angles in pictures to represent power is more pronounced in media contexts in which power is salient. Interestingly, the pictures of powerful persons on Wikipedia also tended to be taken from below, albeit to a lesser degree. This is not surprising given that the pictures are of the most powerful persons on earth. This fact in itself may elicit a salient power context in the online encyclopedia. In contrast, the Facebook context is more about networks and friendship and may, therefore, more likely reduce the salience of power. Importantly, however, vertical picture angles were most extreme on the *Time*s Web site dedicated toward portraying the most powerful person on the world. This is true compared to both Wikipedia and Facebook.

After having provided evidence for both of our hypotheses, our final two studies aim to confirm these effects for individuals producing media content.

STUDY 5

Method

Participants and design. One hundred fifteen students from a UK university participated in this study (51 male, 64 female). The age of the participants varied between 18 and 32 years ($M = 20.34$, $SD = 2.44$). Participants

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received a chocolate bar in return for participation. We manipulated the power of the target person (low vs. high) as a between-participant factor.

Procedure. Participants received a short questionnaire asking for their help finding a suitable picture for a booklet of the Association of European Management Students. The demographic information was asked at the beginning. In the high power condition, participants were asked to choose a picture of the new CEO of the association, a person who set out the future goals of the association, represented the association within the European Union, monitored activities, and communicated to local leaders. In contrast, the target person in the low power condition was described as an interim assistant, a person who supported the secretary by doing administrative work (e.g., copying, data input), writing notes during meetings, and catering. Next, we presented three pictures, either taken from above, the front, or below (see Figure 1). Participants were asked to indicate which picture they would chose for the booklet. We used four different picture sets of target persons (i.e., two men and two women; each participants saw only one picture-set). As the choice patterns were not different across the pictures, we collapsed the data across this factor.[5]

Results

Table 4 displays the obtained distribution of choices. Central to our hypothesis, the Pearson chi-square test indicated that observed choices significantly differed from the expected choices, $\chi^2(2) = 23.59$, $p < .001$, $\varphi = .45$. In line with our reasoning, participants were more likely to choose a picture from below when the target person was high versus low in power. Thus, the power of the target influenced picture choice.

Discussion

The results of this first experimental study provide support for our prediction that individuals choose pictures with vertical angles that are congruent with the power of the target person (Hypothesis 1). Next, we tested whether this effect is influenced by the salience of the power context.

TABLE 4 Study 5: Picture Choices

	Choice of picture			
Condition	Above	Frontal	Below	Total
Powerful	2 (7.4)	37 (40.8)	22 (12.7)	61
Powerless	12 (6.6)	40 (36.2)	2 (11.3)	54
Total	14	77	24	115

Note. Expected frequencies are in parentheses.

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FIGURE 1 Pictures used in Study 5 (A, B, C, and D) and Study 6 (A and E).

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STUDY 6

Method

Participants and design. One hundred fifty two students from a Business School in the Netherlands participated in this study (58 male, 50 female). The age of the participants varied between 17 and 29 years ($M = 20.25$, $SD = 2.32$). Participants received course credits for their participation. We manipulated the salience of power within the context (salient vs. not salient) as a between-participants factor.

Procedure. Participants were placed in separate cubicles in a laboratory. All instructions and questions were provided via computer. After having completed some unrelated studies (in which we gathered the demographic information of our participants), half the participants were ostensibly asked to help some business students who were publishing a short note about the 100 most influential students at the business school by choosing a picture for their purpose (power salient). The other half were ostensibly asked by philosophy students to help them choose a picture for their yearly Facebook of the course "Philosophy and the Mind" (power not salient). Next, participants saw a short text describing a student with the heading "100 Most Influential Students at the Business School" or "Facebook of Philosophy Students in the Course 'Philosophy and the Mind'" accompanied by three possible pictures varying in picture angle. We used two different picture sets that were randomly shown to our participants (from Study 5, see Figure 1). The task of the participants was to choose the most suitable picture.

Results

Table 5 displays the obtained distribution of choices. Central to our hypothesis, the Pearson chi-square test results indicate that observed choices differed significantly from the expected choices, $\chi^2(2) = 9.95$, $p = .007$, $\varphi = .30$. In line with our reasoning, participants were more likely to choose a picture

TABLE 5 Study 6: Picture Choices

	Choice of picture			
Condition	Above	Frontal	Below	Total
Power	11 (11.5)	28 (33.5)	15 (9)	54
Non-power	12 (11.5)	39 (33.5)	3 (9)	54
Total	23	67	18	108

Note. Expected frequencies are in parentheses.

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from below when power was salient compared to when it was not salient. Thus, power salience influenced the choice of pictures.

Discussion

Our final study reveals that differences in the salience of power influence the choice of pictures varying in vertical angle. Thus, Hypothesis 2 was supported, and the results of Studies 5 and 6 help to better understand the findings of the archival studies.

GENERAL DISCUSSION

Our research addresses the reciprocal nature of the relationship between vertical picture angle and the representation of power. This relationship draws support from a broad range of perspectives including evolutionary theories about power and physical height, social learning perspectives on the relationship between power and size and height, and an embodiment perspective on the spatial representation of power. Whereas former research has shown that vertical picture angles influence an observer's perceptions of a target's power (Kraft, 1987; Mandell & Shaw, 1973; Mignault & Chaudhuri, 2003), we provide comprehensive empirical evidence indicating that the media makes use of this association in power-related contexts. Studies 1–3 demonstrate that powerful individuals are most often portrayed from below, such that the observer is looking up at them, and persons seen as powerless are most often portrayed from above, such that the observer is looking down on them. Study 4 confirms our hypothesis that the use of vertical picture angles is more pronounced when the media context focuses specifically on power compared to when it is not. Finally, Studies 5 and 6 demonstrate that these effects in individual behavior, namely that choice of pictures (with regard to vertical angles), is influenced by a target's power and by the salience of power in the social context.

This research corroborates former case evidence of vertical angle use in visual media (Fahmy, 2004; Kepplinger, 1991; Messaris, 1992, 1994). In the following, we will first discuss the theoretical contribution of our research. Subsequently, we will take into consideration potential limitations and future research avenues. Finally, we will outline the practical implications for power and the media.

Our research extends previous research on cognitive embodiment. First, we provide evidence that the association between verticality and power is evident in media content. In other words, whether or not people producing media content are aware of the association, they do utilize vertical angles to represent powerful and powerless individuals. Second, we demonstrate that vertical picture angles are used especially in media contexts with an explicit

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reference to power, such as Web sites like the *Time*s 100, which portray powerful individuals employing a vertical angle from below. Similarly, in less explicit power contexts, such as the World Press Photos, picture angle from below is used for high power scenes and an angle from above for low power scenes, but vertical picture angle is not utilized systematically when power is not relevant or was ambiguous. In addition, the CORBIS picture database demonstrates that pictures associated with powerful or powerless groups are most often represented with a congruent vertical picture angle. This generalizes even to categories such as the gender of the target person, because these categories are connected to perceptions of power (Goodwin & Fiske, 2001).

Whereas these studies clearly demonstrate that the association between power and verticality transfers to the media, the results from Study 4 extend former theoretical thinking on this association. Previous research on the association between power and vertical cues have tended to establish that different types of vertical cues influence power perceptions and vice versa (Giessner & Schubert, 2007; Meier, Hauser, Robinson, Friesen, & Schjeldahl, 2007; Schubert, 2005). Only recently, researchers have started to examine the conditions under which this effect emerges (Lakens et al., 2001). Here, we show directly that varying degrees of vertical angle are used for portraying the same person depending on the media context (i.e., *Time* 100 portraying powerful persons vs. Wikipedia providing encyclopedic information and Facebook providing a social network context). In doing so, our research demonstrates that the association between power and vertical cues does not occur in a social vacuum. Rather, a social context within which power is salient seems to be necessary for a strong association between vertical cues and potentially powerful targets.

Our two experimental studies give insight into the processes that may underlie these effects, namely individual behavior. We argued that if individuals associate power with vertical space in general, their choice of media pictures should be influenced by this association. This is exactly what our experiments show. Both studies demonstrate directly how this association results in picture choices that relate target power to vertical picture angle. Moreover, varying the social context through power salience influences the choice of vertical picture angle. Thus, this article provides both evidence for the effects of the association between power and vertical cues in the use of media pictures as well as evidence that individual picture choices is, at least in part, responsible for these effects. As a result, we show how simple associations between abstract concepts with embodied cues can have impact on our society via media use of pictures.

Our studies also add to the literature addressing media's use of nonverbal cues. For instance, there is evidence that media utilizes head canting, body canting, and smiling to demonstrate dominance (Halberstatt & Saitta, 1987), and head-to-body ratios to demonstrate intelligence (Archer, Iritani,

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Kimes, & Barrios, 1983). Similarly, positions on the horizontal axis are used to denote agency or lack thereof (Maass, Suitner, Favaretto, & Cignacchi, 2009). The present studies demonstrate another nonverbal cue of pictures: the picture angle.

The present research is not without its weaknesses and limitations. While we have used different picture sets in our studies in an attempt to examine representative pictures sets which receive wide media attention (i.e., from *Time*s 100, World Press Photo 2007, Wikipedia, Facebook, Corbis), it may be the case that these picture sets will not generalize to all media. However, we would predict similar effects in other media if the purpose of the media is power-related. Another point of potential criticism is related to alternative explanations of the archival effects. For instance, one might assume that photographers are more likely to shoot powerful targets from below, because powerful persons are more likely to be in contexts in which photographers would necessarily shoot upward at them (e.g., podium). Although this could potentially explain some variance in our archival studies, it cannot account for the results found for many of the powerful and powerless group examined in Study 3a or for the results for men and women in Study 3b. Likewise, our studies have largely focused on pictures taken by professionals who may have been trained to use camera angle as part of their picture setup. While this in itself does not dispute our findings, it would be interesting to explore in the future whether lay photographers would also intuitively make use of camera angle in the context of power. Importantly, though, our experimental evidence indicates that individual picture choices by laypersons of powerful and powerless target persons are indeed influenced by vertical angle. Furthermore, Studies 4 and 6 indicate that the use of picture angle is dependent on context, here the salience of power, and it is likely that other contextual features will also moderate these effects.

With regard to the practical implications of this research, the use of vertical angles to depict power is likely to affect perceivers' power attributions in that pictures depicted from above make the portrayed target appear powerless and pictures depicted from below lead to an inference of a powerful target (Kraft, 1987; Lee & Mandell, 1973; Mignault & Chaudhuri, 2003). By way of embodiment, evolution, and social learning, one might critically note that the use of vertical picture angles in media can itself create an almost "naturally felt," and thus supposedly legitimized, power relationship between the portrayed person and the media recipient. In this regard, vertical angles may be used as a vehicle for legitimizing power. Indeed, individuals who do not possess legitimate power or see their power fading, be it dictators or failing managers in organizations, may attempt to strengthen their authority via media depictions, such as using pictures depicted from below. While it is the job of psychological research to uncover such effects, it is the job of the media to not falsely fall for such orchestrations in which those who covet power insist that on shots from below.

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NOTES

1. Please note that Cohen's Kappa would not be a good estimator of agreement, because we have used a continuous scale and not a categorical scale. Further, if we would treat the seven answer possibilities as categories, Kappa values will be relatively low, because Kappa becomes lower with more categories.
2. We controlled for this fact, because children are smaller and might, therefore, naturally more often being photographed from an above camera angle.
3. We had to restrict our search by these means, because the maximum picture results was 10,000 (at the time of our study). Increasing the database (e.g., by looking for 10 instead 1 year) would have resulted in search results of >10,000—not enabling us to calculate usable statistics.
4. Interestingly, many of the jobs outlined in Table 2 might actually be stereotypically gendered—especially some of the ones with the strongest and lowest percentage of pictures from below (e.g., priest, politician, president, boss, leader vs. tea lady, cleaning lady, secretary etc.).
5. We could not conduct a log-linear regression for the different pictures to test, for instance, whether target gender significantly impact the found interaction between target power and picture angle, because some expected cells are zero (i.e., violating assumptions of the chi-square and log-linear tests). Therefore, we used Fisher's exact probability test for the female and male target persons. Both times the test was significant (male: $p = .001$; female $p = .009$). Distributions are very similar.

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