Original Article

# Why Your Highness Needs the People

## Comparing the Absolute and Relative Representation of Power in Vertical Space

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**Abstract.** Earlier research (Schubert, 2005) showed that power is represented in vertical space: powerful = up and powerless = down. We propose that power is not simply structured in space in absolute terms, but that *relational differences* in power moderate the vertical representation of the powerful *above* the powerless. Two studies reveal that, when power differences are present (vs. absent), the vertical representation of power increases reliably. Power-related words were positioned higher in vertical space (Experiments 1A and 1B), and translated above guessing average by the upper higher one of two Chinese ideographs (Experiments 2A and 2B) when power was manipulated within rather than between participants in an experimental task. These studies support the view that power *relations* constitute an important aspect of the vertical representation of power.

**Keywords:** power, embodiment, representations, metaphors, concepts

Power is often metaphorically represented in vertical space, where the "high and mighty" are placed above those with less power. Schubert (2005) revealed that metaphoric expressions such as having *high* or *low* status are not mere linguistic conventions, but reflect the way we conceptually think about power. Although many studies have provided support for the assumption that abstract conceptual thought is influenced by perceptual and spatial information (e.g., Boroditsky, 2000; Giessner & Schubert, 2007; Glenberg et al., 2008; Jostmann, Lakens, & Schubert, 2009; Meier, Hauser, Robinson, Friesen, & Schjeldahl, 2007; Schubert, 2005; Zanolie et al., in press), an important challenge for an embodied approach to conceptual thought lies in providing a more detailed description of how and when perceptual representations influence conceptual processing (Barsalou, 2008; Bergen, Lindsay, Matlock, & Narayanan, 2007; Schubert & Semin, 2009; Zwaan, 2009). Here, we focus on the question whether power is represented in vertical space in absolute terms (e.g., powerful = up), or whether relative differences in power are structured by representing the powerful *above* the powerless.

## Structuring Power Relations

Studies by Schubert (2005) revealed that words describing powerful and powerless groups are categorized more quickly when presented in their *metaphor-congruent* spatial positions (*up* for powerful groups and *down* for powerless groups) compared to *metaphor-incongruent* spatial positions (*down* for powerful groups and *up* for powerless groups). Now that such metaphor congruency effects have been established in abstract domains such as time, valence, and power (e.g., Boroditsky, 2000; Lakens, Semin, & Garrido, 2011; Meier & Robinson, 2004; Meier et al., 2007; Schubert, 2005; Schubert, Waldzus, & Giessner, 2009), it becomes increasingly important to understand which aspects of abstract conceptual information are represented in space. In our experiments, we address what Zwaan (2009) refers to as the context challenge, which consists of detailing more precisely how simple contextual cues such as the relative spatial positions of stimuli can influence mental simulations. We investigate whether the presence or absence of relational differences in the power dimension moderates the strength with which power is represented in the vertical dimension.

Previous work on the spatial structuring of abstract concepts did not explicitly take a stance on whether relative differences in the conceptual dimension (e.g., power) are an important aspect of how these concepts are structured in space. For example, Schubert (2005) interchangeably uses an absolute spatial structuring of power (e.g., "Powerful = UP," p. 3), and a relative spatial structuring (e.g., "when we think of power differences, we actually think of spatial differences," p. 2). Researchers commonly summarize their results in absolute terms, for instance, by stating that "people automatically assume that objects that are high in visual space are good, whereas objects that are low in visual space are bad"




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(Meier & Robinson, 2004, p. 247), despite the fact that most studies use relative methodologies.

In the domain of power, the repeated experiential co-occurrence of up vertical space with powerful groups (e.g., looking up to your parents) is argued to have resulted in the automatic activation of the concept "powerful" when stimuli are presented up in the visual field, and the activation of the concept "powerless" when stimuli are presented down in the visual field (Schubert, 2005). Thus, the vertical position of a word (e.g., up) is assumed to activate the associated abstract concept (e.g., powerful). The associations activated by the vertical position of stimuli are argued to be obligatory (Meier & Robinson, 2004) and to be processed automatically (Schubert, 2005). Lakoff and Johnson (1980) refer to the one-to-one grounding of abstract concepts as structural metaphors, where an abstract concept is metaphorically structured in terms of a concrete concept.

Other theoretical views on the spatial representation of abstract concepts focus on the relational structure that concrete dimensions provide to abstract domains. These accounts, such as structure-mapping (Gentner, 1983), metaphoric structuring (Boroditsky, 2000), or the structural similarity view (Gattis, 2002), propose that it is the *relationship* between concepts in the abstract domain that can be structured by importing the relational structure from concrete domains. Lakoff and Johnson (1980) refer to such metaphorical representations as orientational metaphors, where physical polar oppositions (e.g., up–down, in–out) structure a whole system of concepts. When applied to the domain of power, the prediction from such a relational view is that vertical spatial relations (i.e., above) are used to structure and represent differences in power by placing those who have more power above those who have less power. This type of metaphoric structuring explicitly stresses the relational nature of the metaphoric representation, and proposes that the vertical representation of power is a representation of differences in power.

If the relational structure of the power dimension is part of the vertical representation of power, then processing powerful groups without relating them to powerless groups will render the function of the vertical dimension to structure the concept of power of limited use, and there should be little reason to import a relational structure from a concrete domain. On the other hand, when the relational difference in power is salient, then the vertical dimension should be used to structure these power differences. The literature so far has not examined whether the presence or absence of relational differences in the power dimension influences the strength of the vertical representation of the power concept. Research investigating the spatial representation of power has always used stimuli high and low in power within the same task (i.e., manipulating power within participants). Because of the within-participant manipulation of power differences in previous studies, it remains to be seen whether the vertical representation of powerful groups would be present if examined outside of the relational context with powerless groups.

## Asymmetries in the Representation of Power Differences

Although statements such as "powerful = up and powerless = down" (Schubert, 2005, p. 3) have an intuitive appeal and give the impression that power is represented in space in absolute terms (see also Lakoff & Johnson, 1980), previous work stressed that power is in fact a relational quality. Power does not express *how* powerful a person is per se, but only whether someone is more or less powerful than another person. According to Fiske's (1992) relational models taxonomy, power relationships (or authority ranking relationships) are not represented as a dimensional construct, but as ordinal categories (Haslam, 1994). As such, this view on the concept of power stresses that people think about power relations, not about absolute levels of power as attributes of people. The salient fact about power is whether someone is more or less powerful than you. According to this relational view on the representation of power, "Highnesses" are not up per se, but simply above the people.

Power differences can be represented by placing the powerful above the powerless, or by placing the powerless below the powerful. Clark (1973) details how the natural asymmetry in vertical space (with downward being limited by the ground, and with upward being unbounded) is reflected in spatial language. He proposes that statements such as "John is above Mary" places John higher then Mary, while Mary remains at ground level (see also Tversky, Kugelmass, & Winter, 1991). The way people think about power and verticality is asymmetrical, where the default endpoints (powerful and above) are used more often in language (Greenberg, 1963; Zajonc, 1968) and are processed more efficiently (Clark, 1969). Therefore, we propose that the most efficient way for people to perceptually represent the relational difference between the powerful and the powerless is to position the powerful above the powerless in vertical space.

If people set the powerful apart from the powerless in vertical space, the spatial anchoring of powerless groups might therefore be less pronounced. Indeed, previous research has observed such an asymmetry in the vertical representation of power. Schubert (2005, p. 17) noted that "the judgments of groups as powerless were less clearly influenced by vertical position than judgments of groups as powerful." If the main function of the vertical representation of power is to structure power differences by placing the powerful above the powerless, then the vertical representation of power should especially concern powerful groups, whereas the position of powerless groups should be less clearly anchored in vertical space.

To summarize, the view on metaphoric representation that stresses that a target concept (e.g., powerful) is structured in terms of a source concept (e.g., up) provides a one-to-one mapping, whereas a relational structuring view highlights the role of concrete spatial dimensions to struc-

 

ture relative differences in the abstract domain (e.g., the powerful are above the powerless). If this latter perspective is correct, the presence of power differences is an important moderator that might contribute to the vertical representation of power. Furthermore, the presence or absence of power differences should influence the vertical representation of powerful groups more than it influences the vertical representation of powerless groups. If, on the other hand, the vertical representation of power does not depend on the presence of absence of power differences, than identical spatial representations of power should be observed irrespective of whether differences in power are manipulated within or between participants. The following studies were performed to test the hypothesis that the relational salience of power differences moderates the vertical representation of power.

## Overview of the Studies

To examine whether the representation of power in vertical space at least partly expresses relative differences in power, we manipulated the presence or absence of power differences in two experiments. We used either both powerful and powerless stimuli in the experimental task (i.e., manipulating power *within* participants), or only powerful or only powerless stimuli (i.e., manipulating power *between* participants). When both powerful and powerless groups are presented in the same experimental task, the relative differences in power should be salient and strengthen the vertical spatial structuring of power differences. On the other hand, when power is manipulated between participants, relative differences in power should be absent in the experimental task, and the tendency to structure power differences in vertical space should be less pronounced. Therefore, the vertical anchoring of powerful groups was expected to be stronger when powerful groups can be represented above powerless groups. Whereas a relational view on power predicts that the vertical representation of power relies on the copresence of powerful and powerless groups (or the within participant manipulation of the power dimension), the one-to-one grounding view would predict the same vertical representation of power irrespective of whether power differences are activated or not.

## Experiments 1A and 1B

In Experiments 1A and 1B, participants were asked to position 60 words on a vertical line. Depending on whether power differences were manipulated within or between participants, the list included words describing powerful groups and words describing powerless groups (Experiment 1A); or, depending on condition, only words describing powerful groups or only words describing powerless groups (Experiment 1B). If the powerful are represented above the powerless, the vertical position of powerful words should be more pronounced when powerless groups are present (by manipulating power within participants in Experiment 1A) compared to when powerless groups are absent (by manipulating power between participants in Experiment 1B). If spatial positions are automatically associated with absolute levels of power, then no differences between experiment 1A and 1B should be expected.

Since power differences were expected to be represented asymmetrically, with the powerful above the powerless, we expected powerful groups to reveal a stronger deviation from the vertical midpoint of the scale than powerless groups. Although powerless groups were not expected to be strongly anchored spatially (see Schubert, 2005), the positioning task used in the current study requires a deliberative spatial response and is considered to induce participants to apply spatial metaphors more reflexively (Richardson, Spivey, Barsalou, & McRea, 2003; Santiago, Lupiáñez, Pérez, & Funes, 2007; Schubert, 2005). We therefore expected that powerless groups might show a significant, but less pronounced deviation from the vertical midpoint when participants had the explicit instruction to position words in vertical space.

### Method

#### Participants

Fifty-five students (40 females, mean age = 20 years) participated in the current experiment for course credit or a monetary reward. Participants were randomly assigned to either Experiment 1A or the powerful or powerless group conditions of Experiment 1B.

#### Procedure

Participants were asked to position 60 words on a vertical line. Participants saw one word at a time in the center of the screen and answered by dragging a vertical slider either up or down from its initial position halfway a vertical line. The instructions read:

> We want to ask you to indicate for each word how high or low what the word represents should be positioned. You can indicate this by sliding the button on the vertical line upward (for high words) or downward (for low words). There are no right or wrong answers. Please answer intuitively, even if you can't give a clear reason for your answer.

The scale ends ranged from 0 *(completely down)* to 100 *(completely up)*. Forty filler items were identical across all three conditions, consisting of positive words (e.g., love, party), negative words (e.g., hate, poison), objects usually located up (e.g., cloud, airplane) or down (e.g., pit, submarine). In Experiment 1A, participants received 10 powerful

(e.g., king, boss) and 10 powerless (e.g., defendant, slave) words in addition to the 40 filler items. The power words were Dutch translations of the words used by Schubert (2005)[1]. In Experiment 1B, participants received either 10 powerful words or 10 powerless words. In the two conditions in Experiment 1B, the total number of words was supplemented by 10 spatially neutral words (e.g., audible, glove) to reach an equal number of trials across the two experiments. Thus, power was manipulated within participants in Experiment 1A and between participants in Experiment 1B.

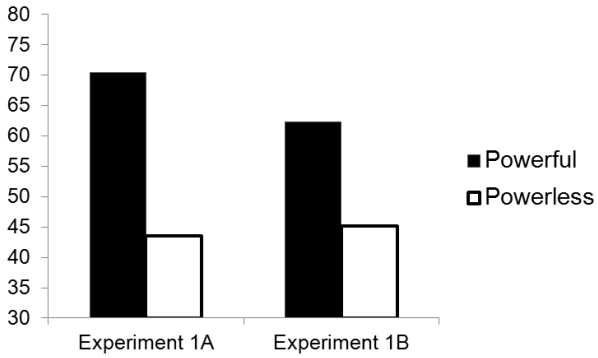


*Figure 1.* Average vertical positioning for powerful and powerless groups in Experiment 1A and 1B, from 0 (down) to 100 (up).

## Results

### Experiment 1A

The average vertical placement was calculated for the 10 powerful and 10 powerless words. Powerful words were placed higher on the vertical line ($M$ = 70.47, $SD$ = 13.01) than powerless words ($M$ = 43.56, $SD$ = 8.59), $t(13) = 5.55$, $p < .001$. The average position deviated significantly from the midpoint of the scale (50) for both powerful as powerless groups, $t(13) = 5.86$, $p < .001$ and $t(13) = 2.80$, $p = .015$, respectively. As predicted, the vertical representation of power was more pronounced for powerful groups than for powerless groups, as indicated by a stronger deviation from the midpoint of the scale for powerful ($M$ = 20.47, $SD$ = 13.08) than powerless groups ($M$ = 6.44, $SD$ = 8.59), $t(13) = 4.15$, $p = .001$.

### Experiment 1B

When power was manipulated between participants, powerful words were placed higher on the vertical line ($M$ = 62.27, $SD$ = 9.00) than powerless words ($M$ = 45.14, $SD$ = 4.67), $t(32) = 6.83$, $p < .001$. The average position deviated significantly from the midpoint of the scale for both powerful as powerless groups, $t(17) = 5.78$, $p < .001$ and $t(15) = 4.16$, $p = .001$. As in Experiment 1A, powerful groups deviated more from the midpoint of the vertical scale ($M$ = 12.27, $SD$ = 9.00) than powerless groups ($M$ = 4.86, $SD$ = 4.67), $t(32) = 2.96$, $p = .006$.

### Manipulating Power Within vs. Between Participants

We subsequently tested the difference in the vertical representation of powerful groups, depending on whether powerless groups were present or absent. As expected, the average vertical position for powerful groups in Experiment 1A was higher than the vertical position for powerful groups in Experiment 1B, $t(30) = 2.10$, $p = .04$ (see Figure 1). The difference between the powerless groups did not differ between Experiment 1A and 1B, $t(28) = –0.64$, $p = .53$. Powerful groups were thus positioned higher on a vertical line when powerless groups were copresent in the same task, whereas no differences were observed for powerless groups based on the presence of absence of powerful groups.[2]

The 10 spatially neutral filler items did not differ between the powerful ($M$ = 52.33, $SD$ = 6.93) and the powerless ($M$ = 51.20, $SD$ = 5.86) conditions of Experiment 1B ($t < 1$), nor did the average vertical placement for the positive, negative, up, and down filler words differ between the two experiments (all $p$s > .05). However, "up" words were generally placed higher on the vertical line ($M$ = 72.93, $SD$ = 13.82) than "down" words ($M$ = 32.59, $SD$ = 11.74), $t(47) = 12.34$, $p < .001$, and positive words were generally placed higher on the vertical line ($M$ = 77.20, $SD$ = 8.64) than negative words ($M$ = 23.74, $SD$ = 11.35), $t(47) = 19.97$, $p < .001$, in line with related literature that valence is represented in vertical space (Meier & Robinson, 2004).

## Discussion

Powerful groups are positioned higher in vertical space when powerless groups are copresent in the same task, compared to when powerless groups are absent. These results support our hypothesis that the vertical positioning of powerful groups is moderated by the presence or absence

[1] Powerful items: boss, judge, professor, chancellor, government, general, king, president, warder, head physician. Powerless items: secretary, defendant, student, child, apprentice, prisoner, worker, soldier, sick person, slave.

[2] Note that the nature of the current investigation – comparing the manipulation of power within-participants against between-participants – does not permit an omnibus ANOVA or repeated measures GLM, since the translation judgments for powerful and powerless groups are dependent for half of the participants, and independent for the other half of the participants. Although technically Experiment 1A and 1B (and 2A and 2B) could be seen as three conditions of the same study for the ease of interpretation the data are presented as two separate experiments.

 

of powerless groups, but not vice versa. The vertical representation of powerful groups is more pronounced when power differences are salient, indicating that the vertical representation of power is at least partly relational in nature. Based on the assumption that differences in power are structured by setting the powerful apart from the powerless groups in vertical space (while powerless groups themselves are less clearly spatially anchored) we predicted and found that the vertical position of powerless groups did not depend on the within- or between-participant manipulation of power. The presence or absence of the powerful group did not change the positioning of the powerless groups. This result speaks against the possibility of a mere contrast effect, with more extreme responses when power was manipulated within (vs. between) participants, since a contrast effect would predict both a higher vertical placement for powerful groups, and lower vertical placement for powerless groups.

On average, powerful groups deviated more from the midpoint of the vertical scale than powerless groups. Nevertheless, powerless groups were still placed significantly below the midpoint of the scale in Experiment 1. This result mirrors findings by Schubert (2005, Study 1), who found that powerless groups were clearly structured in vertical space when the task required a deliberative spatial response. Researchers investigating the spatial representation of concepts differentiate between tasks that allow participants to simply apply a metaphor by explicitly asking participants to structure concepts in space as the task used in Experiment 1 (e.g., Richardson, Spivey, Edelman, & Naples, 2001; Schubert, 2005, Study 1; Tversky et al., 1991) and paradigms where the influence of the vertical dimension on judgments or responses emerges more unintentionally (e.g., Richardson et al., 2003; Santiago et al., 2007). In these latter cases, where instead of the spatial positioning of stimuli reaction times or judgments under uncertainty were used as the dependent variables, no clear vertical positioning of powerless groups is observed (e.g., Schubert, Studies 2 to 6).

In order to investigate the vertical representation of power-related words in a task where participants are not deliberatively structuring concepts in vertical space, Experiment 2 resorted to a measure that did not require participants to purposefully position words in vertical space (see Schubert, 2005).

# Experiments 2A and 2B

This experiment investigated the vertical representation of power-related words in a task where participants were not required to deliberately place stimuli in space. We used a Chinese translation paradigm (Lakens, Semin, & Foroni, in press), where participants are asked which of two Chinese ideographs is the correct translation of a Dutch word. The perceptual characteristics of the ideographs (i.e., their spatial position) are manipulated to examine how spatial positioning would influence participants' answers of whether an ideograph correctly represented the meaning of a stimulus word. Importantly, the Chinese translation paradigm allows for the abstract conceptual dimension under investigation to be manipulated between participants. In Experiment 2A, participants received words referring both to powerful *and* powerless groups, whereas in Experiment 2B participants received words either referring to powerful *or* powerless groups. In other words, power was manipulated within participants in Experiment 2A and between participants in Experiment 2B.

We expected that, when power differences were present (by manipulating power within participants), the likelihood of the top ideograph being chosen would be above guessing average for words describing powerful groups (Experiment 2A). We expected no deviation from guessing average for powerful groups when power differences were not salient by manipulating power between participants (Experiment 2B). Such a pattern of results would not be predicted if power is metaphorically represented in space in absolute terms, whereas it follows from the hypothesis that the vertical representation of power relations at least partly structures differences in power. Given our prediction that the concept "powerless" is not strongly anchored in vertical space and the use of a less reflexive measure of the vertical representation of power compared to Experiments 1A and 1B, we did not expect a clear bias toward the upper or lower ideograph for powerless groups (see Schubert, 2005).

## Method

### Participants

One-hundred and fifty-five students (98 females, mean age = 20.8 years) participated in return for a monetary reward. Participants were randomly assigned to either Experiment 2A or to the powerful or powerless group condition in Experiment 2B.

### Procedure

In Experiment 2A, 10 words describing powerful groups and 10 words describing powerless words (identical to the stimuli used in Experiments 1A and 1B) were presented one at a time in the center of the computer screen, together with two Chinese ideographs presented in the top right and the bottom right quarter of the screen. The words, ideographs, and the spatial assignment of each ideograph were randomly determined for each trial. Participants were instructed to choose the ideograph they judged to be the correct translation for the Dutch word. The task was identical for the participants in Experiment 2B, with the exception that they translated 10 words instead of 20 as in Experiment

2A. The words all described either powerful groups, or powerless groups, depending on the condition manipulated between participants.

## Results and Discussion

### Experiment 2A

Since choices for the upper and lower ideograph are mutually exclusive, the average number of times participants chose the upper ideograph to translate powerful and powerless words was calculated. Two one-sample *t*-tests against guessing average (5 out of 10) for powerful and powerless stimuli revealed that, as expected, powerful words were translated by the upper ideograph above chance, ($M$ = 5.62, $SD$ = 1.70), $t(75) = 3.16$, $p = .002$, Cohen's $d = .37$, whereas the likelihood that powerless words are translated by the upper ideograph did not differ from chance, ($M$ = 5.01, $SD$ = 1.57), $t(75) = 0.07$, $p = .94$, Cohen's $d = .01$. Furthermore, a paired-samples *t*-test revealed that participants were more likely to choose the upper ideograph for powerful words than for powerless words, $t(75) = 2.06$, $p = .04$ (see Figure 2).

### Experiment 2B

Two one-sample *t*-tests against guessing average (5 out of 10) revealed that the average number of choices for the upper ideograph did not differ from chance in the powerful ($M$ = 5.12, $SD$ = 1.15), $t(41) = .67$, $p = .51$, Cohen's $d = .10$) and powerless word condition ($M$ = 5.02, $SD$ = 1.36), $t(35) = .12$, $p = .903$, Cohen's $d = .02$). An independent-samples *t*-test revealed translation judgments did not differ between the two conditions ($t < 1$).

### Manipulating Power Within vs. Between Participants

To test whether stimuli referring to powerful groups were translated by the upper ideograph more often in Experiment 2A than Experiment 2B, we performed an independent samples *t*-test. As hypothesized, the predicted difference in choices for the upper ideograph, depending on whether power was manipulated within or between participants, was significant, $t(116) = 1.70$, $p < .05$ (one-tailed, see Figure 2). Translation judgments for powerless groups did not differ between Experiment 2A and 2B, $t(110) = 0.48$, $p = .96$. Participants preferred the upper ideograph as a translation for words describing powerful groups, but only when power differences were manipulated within participants. The vertical position of Chinese ideographs did not influence translation judgments for words describing powerless groups.

Although Experiment 2A and 2B differed in the number of trials (10 vs. 20), we believe it is highly unlikely the number of trials caused the difference between the two experiments. First, preferences for the upper or lower ideograph did not differ between the first 10 translation judgments and the second 10 translation judgments ($t < 1$). Second, translation judgments for powerless groups did not differ between Experiment 2A and 2B, even though the number of trials differed. Furthermore, previous experiments revealed reliable differences from guessing average in the Chinese Translation Paradigm when participants translated only words related to one endpoint of an abstract dimension (e.g., only negative words) by choosing between two ideographs, or when indicating whether or not a single Chinese ideograph was the correct translation of a Dutch stimulus word (Lakens et al., in press). Therefore, we can safely conclude that the vertical representation of power depends upon the presence or absence of powerless groups, supporting the hypothesis that relational differences in power are an important moderator that determines the strength of the vertical representation of power.

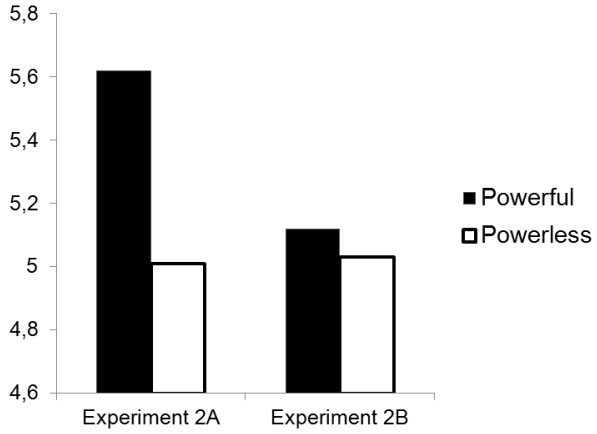


*Figure 2.* Average translation choices for the upper ideograph in Experiments 2A and 2B for terms indicating powerful and powerless groups.

## General Discussion

Previous research revealed that power is represented in vertical space (Giessner & Schubert, 2007; Schubert, 2005; Schwartz, Tesser, & Powell, 1982), where powerful groups are represented above powerless groups. The present research examined whether power is represented in space in absolute terms (powerful = up), or whether the vertical representation at least partly structures *power relations*. The results from two experiments support the hypothesis that the vertical representation of power is moderated by the presence or absence of differences in power. Using an explicit spatial positioning task (Experiment 1), we showed that the vertical representation of powerful groups was more pronounced when powerless groups were copresent in the task, compared to when powerless groups were absent. Experiment 2, using

 

a judgment under uncertainty paradigm that did not require the deliberative spatial positioning of power-related words, revealed that the spatial representation of power was present only when power differences were manipulated within participants (i.e., powerless groups are present), but not when power differences were manipulated between participants (i.e., powerless groups are absent). These findings suggest that the degree with which power is represented in the vertical dimension is moderated by the presence of relative power differences. The idea that the vertical representation of power structures differences in power is in line with previous work on the function of metaphors, which in addition to mapping an abstract concept to a concrete concept (structural metaphors) are argued to sometimes organize a whole system of concepts with respect to one another (orientational metaphors, see also Boroditsky, 2000; Gattis, 2002; Gentner, 1983). In other words, especially when "Highnesses" stand *above* the people is their relative power represented in vertical space.

The current research manipulated the presence or absence of power differences by manipulating power within versus between participants. In terms of experimental design, this approach is difficult, not only because of the lack of statistical tests directly comparing within- and between-participant manipulations, but also because of the need to either complement the number of trials when manipulating the power dimension between participants with additional stimuli (Experiment 1B) or to reduce the number of trials (Experiment 2B). Future research could approach the importance of power differences for the vertical representation of power by priming power relations and testing whether the vertical representation of power is more pronounced compared to a control condition. However, an important contribution of the current studies is the fact that manipulating power differences within participants (e.g., Schubert, 2005) can reliably strengthen the vertical representation of power. Our results suggest that the vertical representation of power observed previously (Meier et al., 2007; Schubert, 2005; Zanolie et al., in press) might somewhat depend upon the presence of power differences.

Our findings further suggest that, because of the default ordering of the powerful above the powerless, powerless groups are less clearly anchored in vertical space. A deviation from ground level might emerge only for powerless groups when participants are more deliberatively positioning powerless groups in vertical space (Exp. 1, see also Schubert, 2005, Study 1). This relational perspective on the representation of power differences might also explain previously observed asymmetries in the representation of power, where powerless groups were less clearly influenced by spatial information (Schubert, 2005), and similar asymmetries in the vertical representation of God above the Devil (Meier et al., 2007). Although the presence or absence of both endpoints of the conceptual dimension may be especially important for the perceptual representation of an inherently relational construct such as power (Fiske, 1992; Haslam, 1994), future research is necessary to establish whether the presence or absence of both endpoints of the abstract dimension similarly moderates the perceptual representation of other abstract concepts such as valence or morality.

The spatial representation of the powerful above the powerless might reflect the general asymmetry of vertical space in daily life, where the ground level provides a natural boundary downward, but the sky above is considered unlimited (Clark, 1973; Tversky et al., 1991). Although above is the default endpoint of the vertical dimension (Chase & Clark, 1971; Clark, 1969; Logan, 1994; Seymour, 1973), and people might therefore by default represent powerful groups above a powerless reference group, this default way of representing power differences might change depending on the context. Banks, Clark, and Lucy (1975) found that people more quickly choose the higher (vs. lower) of two balloons (which we typically view as being above us), whereas the reverse is true for two yo-yo's (which we typically look down upon). This study reveals that, under certain circumstances, "below" can become the default. Perhaps individuals who are very powerful in daily life are more inclined to representing the powerless as being below themselves. Cultural differences might play a similar role in determining which representation of power differences is the default. Structuring powerless individuals below a powerful reference group might be more common in less egalitarian cultures. In The Netherlands, for example, looking down on others is frowned upon, and bowing before others is not common practice. Finding that in less egalitarian cultures the powerful are the default – and the powerless are represented below the powerful – might provide an interesting extension of the current findings.

Many researchers have questioned the role embodied representations play in language understanding. Perceptual representations have been argued to be ill-suited to represent abstract concepts (Dove, 2009; Mahon & Caramazza, 2008), that they provide only partial and imprecise understanding of the exact meaning of concepts (Murphy, 1996), and that people seem to be highly accurate in categorizing words even when perceptual information is incongruent with the meaning of words (see Schubert & Semin, 2009). An important step in clarifying the function of perceptual representations in language understanding would be to investigate which aspects of abstract concepts are perceptually represented (see also Bergen et al., 2007; Zwaan, 2009). The current studies indicate that an important function of perceptual representations is to structure abstract concepts (see Boroditsky, 2000). Making conceptual distinctions in the power dimension (by setting those who have more power apart from those who have less power) might be a more important function of the vertical representation of power than to understand the meaning of the concept *powerful* through associations with *up* vertical space. Determining which metaphors structure conceptual dimensions, and which metaphors express the meaning of an abstract concept in terms of a concrete concept, provides an interesting avenue for future research.

Differentiating two people or social categories in vertical space creates a meaningful framework for representing authority-ranking relationships, which allows people to learn about, represent, and express social relationships (Fiske, 1992). The current experiments provide a first indication that the vertical representation of power at least partly reflects power relations and not just absolute levels of power. While the function of perceptual representations to think about social concepts has been questioned (Dove, 2009), we believe perceptual representations can structure and constrain thoughts about social relationships in important ways.

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