

# The influence of verticality metaphor on moral judgment and intuition

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**Abstract**—Lakoff and Johnson’s theory of conceptual metaphor predicts that the notion of verticality is often used as a basis for understanding concepts: so, for example, physically higher locations are associated with morally good, and lower locations are associated with immorality. As the moral dimension plays a crucial role when we judge other people, one would expect that verticality metaphor is also connected with moral evaluation of other people. We present here two experiments to explore this issue. Results of the first experiment suggest that the judgment of a morally ambivalent behaviour description is more favourable when presented at the top of the page in comparison to presenting it at the bottom of the page. The second experiment shows that participants are more willing to stop to talk to a volunteer asking for donation for charity after they ride up the escalator rather than after riding down. These results together lead to the conclusion that activation of verticality metaphor influences moral judgment, both when it comes to deliberate and conscious evaluation (first experiment), and also when the decision is based on the first impression, intuition and automatic reaction (second experiment).

**Keywords**—metaphor; morality; social judgment

## (i) METAPHORS IN SOCIAL AND MORAL COGNITION

Based on language analysis, Lakoff and Johnson postulated that our cognition is mostly metaphorical. In this sense, metaphors are defined as understanding and experiencing certain kinds of things in terms of different kinds of things. Metaphors exist as language expressions because they are inner part of our conceptual system. One basic type of metaphors is orientational metaphor. It consists of two aspects: a source domain, which is how our bodies are built and how they interact with the external world, and a target domain, which is our understanding of abstract concepts. Most of these metaphors are connected with expressions describing spatial orientation, for example: up-down, in-out, front-back, on-off, deep-shallow, central-peripheral [13]. In this article we focus on the up-down metaphor.

There are many examples showing how metaphorical orientations arise from our physical and cultural experience. For instance, upright posture typically goes with positive emotional state and dropping posture is connected with negative emotional state [14]. As a result, the metaphor ‘happy is up/sad is down’ is common in everyday language: as in ‘I’m feeling up’, ‘my spirit rose’, ‘I fell into a depression’, ‘I’m feeling down’. In general, many positive aspects are usually connected with the up dimension; e.g. healthy is up (‘he is at the peak of health’), more is up (‘my income rose’), high status is up (‘she is climbing the ladder’). Conversely,

expressions such as ‘he dropped dead’, ‘she is underage’, ‘he fell in status’ suggest that the down dimension is usually connected with negative occurrences. Verticality metaphor is also broadly related with morality, which is visible in expressions such as ‘she is so high minded’, ‘he is really of low moral character’ and ‘she fell into disgrace’ [10,11]

Another interesting conceptualisation of the role of verticality metaphor in moral cognition was proposed by Brandt and Reyna [4]. The idea is that humans understand and perceive abstract and real social targets through the metaphor of chain of beings. The top of the chain is occupied by supernatural entities, humans are situated in the middle of the chain, and demons at the bottom. Hence, the chain ranges from the most to the least moral beings. It has implications for the perception of other people, as social targets perceived higher on the chain will be treated better, while the ones lower on the chain will experience worse treatment for their deeds.

## (i) EMBODIED COGNITION AND METAPHOR

The relationship between metaphor and morality is connected with embodied cognition because metaphorical concepts are often considered as resulting from bodily experiences. The theories of embodied cognition assume that to a large extent our mental processes depend on bodily states and modal representations [2, 26]. This claim is supported by several current empirical findings. For instance, experiments show that there is a close connection between empathy and mirror neurons, which fire when performing an action but also when watching the same action being performed by another person [22]. Additionally, there are studies suggesting that our conceptual representations are tightly related to certain corresponding modalities [12].

Most importantly, research shows that embodiment influences complex social and moral cognition processes [16]. Embodied approach is of great relevance for how we understand human social cognition. A number of metaphors we commonly use to describe social and moral concepts are restricted by bodily experience and our interactions with the external world. Especially relevant for moral domain are various experiences connected with physical well-being, e.g. being upright, strong, clean [15].

## (ii) CURRENT RESEARCH IN VERTICALITY METAPHOR

Empirical findings show that there is a broad relationship between the verticality metaphor and good-bad and moral-immoral concepts. Some studies suggest that positive or negative affect is generally connected with word

placement (up vs. down) and selective attention to certain areas on the screen (towards top or bottom of the screen). For instance, Meier and Robinson [18] show that when word valence and position in the vertical dimension were congruent (up is connected with positive and down with negative meaning), the participants were faster in deciding whether the words presented were positive or negative. The connection between positivity/negativity and verticality metaphor is also shown in experiments where participants were engaged in actual physical movement or the illusion of movement. In a series of two experiments, Casasanto and Dijkstra [3] showed that the respondents asked to recall positive memories were faster when performing upward hand movements at the same time. Conversely, downward hand movements facilitated recall of negative memories. Additionally, when participants were asked to recall any memory, congruent hand movements resulted in an increased recall of memories with the corresponding value. Another interesting experiment on this topic used the illusion of self-motion to activate up vs. down metaphor. This illusion occurs when a broad area of the visual field moves while the viewer remains stationary resulting in the 'vection' experience for the viewer, which feels as if the viewer is moving herself or himself while the world remains stationary. Sasaki et al. [23] used a phenomenon called upward movement illusion, which is characterised by the feeling of going upward as a result of optic flow change. The results show that the upward movement illusion biased recall of positive memories. Conversely, positive sounds (e.g. baby's laughter) facilitated the perceived strength of vection experience during the upward movement illusion.

Yet another group of experiments explore the relationship between the vertical dimension and moral concepts. Hill and Lapsley [9] found that the participants took longer to categorise moral traits when presented in the upper visual field. Another study showed that the respondents were more willing to place moral terms in the space presented above the cartoon character, and immoral terms in the space below the character. This points to a congruency effect between immoral terms and down space and moral terms and up space. Furthermore, in an implicit priming task, respondents asked to keep moral concepts in their memory had a tendency to overestimate height of objects, while those asked to memorise immoral concepts underestimated height of objects [24]<sup>1</sup>. Meier et al. [19] found similar result showing that encoding of moral concepts is faster when they are shown on the top of the screen or coupled with upper visual cues.

Interestingly, coupling between verticality and morality does not occur in psychopaths [19]. This result suggests that moral concepts are indeed rooted in the embodied notion of verticality. In line with this result, Herve et al. [8] have shown that people with high levels of psychopathy had difficulties in understanding the meaning of emotions in complex metaphors. The participants understood the literal content, but failed to catch the culturally shared emotional connotation suggested by the valence of the metaphors. Psychopaths could

only catch the surface literal meaning of presented statements. This seems especially relevant in the light of contemporary theories that emphasise the role of emotions in moral judgment. For instance, Haidt [7] suggests that emotions are substantive for how people judge others in moral domain. According to Haidt's social-intuitionist theory, rational explanations of moral judgment are rather post hoc rationalisations of the results of emotional processes. Hence, the lack of understanding of complex emotional metaphors observed in psychopaths could be related to their problems with moral cognition, as both metaphors and emotions are crucial in this domain. This suggestion relates directly to the metaphorical understanding of morality, which is the core of Lakoff and Johnson theory of conceptual metaphor.

### (iii) MORAL DIMENSION IN JUDGMENT OF OTHER PEOPLE

When people make social judgments about other people — about their behaviour, or even just their faces — they usually do so in terms of moral categories. Wojciszke [28,29] introduced a distinction between moral and competence dimensions in social and self judgment. Competence in this sense refers to information about abilities and effectiveness in goal achievement. On the other hand, morality covers the range of information about maintaining social relationships by another person, the way her actions influence others' well-being and moral norms. These two categories are logically independent, however very often they are also used as alternative interpretation styles of information about other people. As moral content dominates our social cognition, moral categories are chronically activated and automatically influence our perception. Conversely, our own behaviour is frequently judged from the perspective of competence. For instance, participants asked to name features that are important for them in other people, listed characteristics strongly connected with morality rather than competence. On the other hand, when asked about features important in themselves, they listed traits connected with competence. Interestingly, even knowledge about other person's competence does not improve assessment of her behaviour as long as it is not accompanied by moral features. After all, a very clever person with bad intentions is rather a threat than an ally.

### (iv) OVERVIEW OF STUDIES

Most of the previous research focused on the influence of vertical dimension on word activation, memory recall and speed of word categorisation. However, to the best of our knowledge, the influence of spatial concepts on moral judgment of other people has not yet been investigated in a field study<sup>2</sup>. On the other hand, in the domain of purity metaphor research, there are several experiments exploring the influence of physical cleanliness on social and moral evaluation (see, for instance, [30,31]). It seems plausible to expect that as verticality metaphor activates concepts like good/bad, moral/immoral, it should also affect how we judge

<sup>1</sup> The full article by Wang & Lu [24] is not available in English language so the information about results was obtained only from the abstract.

<sup>2</sup> However, there has been some research on how the vertical metaphor influences the perception of power [20].

other people's actions and features. It is especially probable given that moral categories are the most important when we evaluate others. The features representing moral and social functioning connected with the benefits and losses other people get from one's behaviour are very willingly taken into consideration when we form opinions about others [29]. Hence, in the first experiment, we chose to study the hypothesis that descriptions of morally ambivalent behaviours of other people would be judged more favourably when presented at the top of the page in comparison to presenting it at the bottom of the page.

The second study was an attempt to additionally explain and elaborate the first experiment. It includes using a different manipulation to activate the verticality metaphor - through going up or down an escalator. Also, different measurement of moral evaluation was taken - participants were asked to take part in a volunteering action. The first hypothesis is that people after riding up the escalator will be more willing to express interest in volunteering and take the contact card offered. This assumption was based on the fact that the verticality metaphor is connected with abstract concept of morality and immorality. Hence, the participants after riding up the escalator should activate the concept of morality and conversely riding down should prime the notion of immorality. As volunteering for charity is commonly perceived as a moral action, the increase in the readiness to take up such action was predicted in the condition of riding up an escalator. On the other hand, after riding down the escalator, the concept of immorality should activate and as a result decrease the probability of interest in volunteering.

The second hypothesis of this study is that people after riding up the escalator will be more willing to stop to listen to the experimenter, while the ones riding down will rather tend to ignore the request right away. As the vertical dimension metaphor is connected with affect and understanding of good vs. bad, it should also facilitate positive or negative affective reaction tendency. Hence its activation should influence the readiness to listen and the openness for other people.

(v)

#### EXPERIMENT 1

The aim of the first experiment was to investigate the influence of vertical dimension activation on judgment of other people's behaviour. The first hypothesis was that the behaviour description shown at the top of the page will be perceived as more acceptable than when presented at the bottom of the page. Similarly, the second prediction was that the behaviour description shown at the bottom of the page will be evaluated as less acceptable compared to presenting it at the top of the page. Thus, through activating associated concepts (up-good/moral, down-bad/immoral) verticality metaphor should induce congruent behaviour judgment.

##### A. Participants

Thirty polish-speaking volunteers (nine males and twenty-one females) with mean age of 20 years participated in the study.

##### B. Materials

The participants were asked to fill in a questionnaire with five morally ambivalent behaviour descriptions and to judge the moral value of each behaviour on the Likert scale. The descriptions were based on the Defining Issues Test (DIT-2) [21] and Wojciszke's 'Etyk' Questionnaire [27]. There were two versions of the questionnaire. The first one included Adam's case at the top ('Adam steals food from another man during famine and his family starvation') and Susi's case at the bottom ('Susi comes from a poor family. She married a rich man whom she does not love but who supports her family financially'). In the second version, Susi's case was presented at the top while Adam's case was shown at the bottom of the page. In between the first and the last question, three other questions were presented in order to create a regular survey impression. On each questionnaire there was an instruction asking the participants to evaluate behaviours on the scale from -3 to 3, where -3 means 'very inappropriate', -2 'inappropriate', -1 'slightly inappropriate', 0 'neither inappropriate nor appropriate', 1 'slightly appropriate', 2 'appropriate' and 3 'very appropriate'. This scale was presented to Polish participants in Polish language. Scale points (from very inappropriate to very appropriate) were exactly the same as in Wojciszke's 'Etyk' questionnaire, which was investigated for its reliability and validity and recommended for use in individual diagnosis and scientific research. Hence, we assumed that the scale will be understood as linear [27]. The page was size A4, the distance between top and bottom behaviour descriptions was 11 centimetres. The full questionnaires are included in the appendix.

##### C. Procedure

The experiment was conducted in the city centre of Cracow, where participants were asked to take part in a scientific research. Next, they were asked to individually fill in the questionnaire. During the study participants were standing in order to eliminate potential differentiation in verticality metaphor activation caused by varied body posture among respondents. Additionally, the nearest surface was flat, without any escalators, elevators or hills.

##### D. Results

As we stated directional hypothesis predicting specific of the relationship between variables, we have decided to perform one-tailed *t* test for equal variances. The test revealed that there were significant differences in judgment of Adam's behaviour depending on whether it was presented at the top ( $M = -0,47$ ,  $SD = 1,46$ ) or at the bottom ( $M = -1,4$ ,  $SD = 1,4$ ) of the page,  $t(28) = -1,79$ ;  $p < 0,05$  (Fig. 1). The effect size ( $d$  Cohen = 0,65) suggests medium relationship between behaviour evaluation and the placement of the description. Hence, the behaviour was evaluated as more appropriate when presented at the top than at the bottom of the page.

In Susi's case one-tailed *t* test for equal variances revealed that there were no significant differences in evaluation depending on whether the behaviour was shown at the top ( $M = -1,20$ ,  $SD = 1,61$ ) or at the bottom ( $M = -1$ ,  $SD = 1,73$ ) of the page,  $t(28) = -0,327$ ;  $p > 0,05$  (Fig. 2).

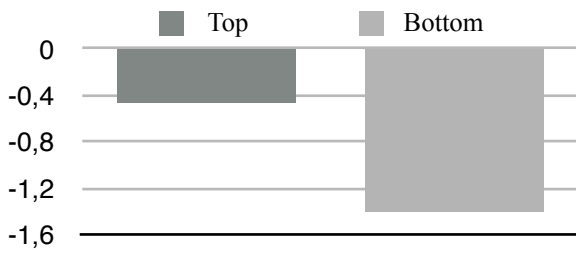


Fig. 1. Moral judgment depending on the localisation of the behaviour description in Adam's case.

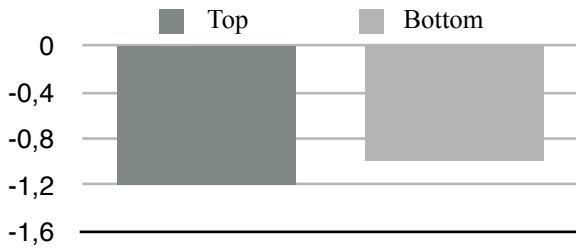


Fig. 2. Moral judgment depending on the localisation of the behaviour description in Susi's case.

*E. Discussion*

The first case presented in the study suggests that the participants judged morally-ambivalent behaviour description as more appropriate when it was presented at the top of the page in comparison to the bottom of the page. This result confirms the hypothesis that the up/down dimension is connected with abstract concepts e.g. good/bad, moral/immoral.

However, the second case did not show any statistically relevant difference between presenting the behaviour description at the top or at the bottom of the page. The lack of statistically significant effect in Susi's case may be a result of the fact that the behaviour described turns out to be ambivalent rather in a conventional way than in a moral way. The original assumption of this item was to make it similar to Adam's case - the situation described in both cases is based on a schema where someone had to do something immoral in order to provide for one's family. Hence, the ambivalence arises between one immoral and one moral action. However, Susi's case appears to be rather stereotypical so probably the participants already had certain opinions about women who marry for money.

Another aspect worth noticing is that it is possible that morality of the person whose food was stolen (in Adam's case) and the person who married Susi (in Susi's case) could have been the object of judgment, rather than morality of Adam and Susi themselves. During the experiment participants did not express doubt about which person they should judge, so this possibility does not seem very probable. However, it would be informative to repeat the study controlling for this issue.

(vi)

EXPERIMENT 2

As the results in the first experiment were not fully consistent, we designed another experiment to test the influence of verticality metaphor on social judgment using a different methodology. This second study was a field experiment to allow for greater ecological validity and practical applicability of the results. As the main concern of our research is the social judgment, it is crucial to make it as realistic as possible. Additionally, the first study imposed judgment of behaviours that were right away presented as morally relevant and hence engaged intentional and purposeful opinions as it immediately activated aspects of behaviour people find especially important. In the second experiment however, more broad and rapid aspect of social judgment is measured, which can be defined as the first impression rather than deliberate and conscious opinion. Furthermore, in this study, the verticality metaphor was activated by manipulating the bodily experience itself, rather than placing words high or low on the screen/paper. This manipulation was assumed to be more effective as it is more consistent with the previous experiences with concrete notion of verticality.

In the second study, the participants' behaviour was observed in a real life situation where verticality metaphor was activated by the participants riding up or down on an escalator. Right after the ride, at the top or the bottom of the escalator, they were asked by the experimenter if they would be willing to volunteer for a charity organisation and they were offered a card with the contact information of the foundation. The first prediction was that after riding up the escalator, the participants will more often express interest in volunteering than after riding down the escalator. Additionally, we hypothesised that more participants after riding up will stop to listen to the volunteer, in comparison after riding down.

*A. Participants*

Sixty polish-speaking participants took part in this experiment. As the area was not very crowded, every person riding on the escalator was included in the sample except from people who were visibly in a hurry (walked very fast or ran).

*B. Material*

The material for this experiment was made available by the Polish Humanitarian Action. The experimenter received a badge with the ID, a folder with the logo and cards with contact information of the organisation. Polish Humanitarian Action is one of the well-known charity foundations in Poland so the logo was rather recognisable.

*C. Procedure*

The experimental procedure was conducted in the underpass near a big roundabout in the city centre of Cracow. In the first condition, right after riding down the escalator participants were asked if they are interested in volunteering for Polish Humanitarian Action and were offered a card with the contact information for volunteering. In the second condition, the same request was made right after participants went up the escalator.

#### D. Results

During the study only three participants, who were riding up the escalator, expressed interest in volunteering and took the information card. Hence, the first hypothesis could not be verified because there was not enough variation in the number of people who wanted to volunteer and the ones who did not. However, the second hypothesis was confirmed - participants who went up the escalator stopped more often to listen what the experimenter asked than people who went down the escalator (Fig. 3). In order to investigate the relevance of the relationship between analysed variables, two-tailed Chi-square test of independence was performed. The result allows to reject zero hypothesis and accept alternative hypothesis  $\chi^2(1, N = 60) = 5,41; p < 0,05$ .

#### E. Discussion

A lack of participation resulted in our not being able to confirm or refute the first hypothesis that the participants will be more willing to volunteer time when they were riding up the escalator compared to the condition when they were riding down. Probably the favour asked was too difficult for the participants because volunteering usually requires donating much time. Additionally, the time was not specified in the initial request, so only participants who stopped to listen had the opportunity to find out that they can spend only one or two hours per week for volunteering. However, even after learning that, most of the participants did not agree to volunteer.

The second hypothesis however was confirmed - respondents after riding up the escalator were more willing to stop to listen than participants who went down. The majority of the participants, after riding down the escalator, said right away that they are not interested or ignored experimenter completely. Most probably, riding in the upper direction activated the concept of good/moral, which resulted in the increase of readiness to make a contact with the experimenter as the moral categories are the most relevant in judging other people. In other words, participants in the riding up condition perceived the experimenter more positively, which resulted in their willingness to have a conversation.

One of the questions that may arise in the context of this experiment is whether the verticality metaphor was in fact activated by the introduced manipulation. The methodology was inspired by the experiment of Sasaki et al. [23], which showed that upward movement illusion biases the recall of positive memories and also positive sounds facilitate the perceived strength of vection experience during the upward movement illusion. As the mere illusion of upward movement activated verticality metaphor, it appears reasonable to assume that the actual upward movement will also have this effect.

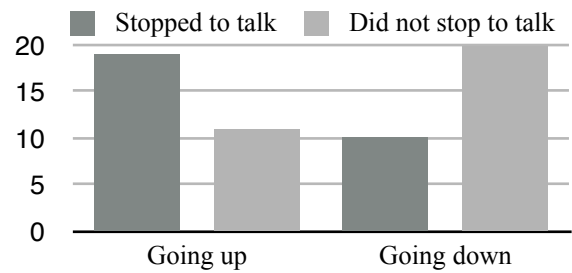


Fig. 3. The number of participants who stopped to talk to the volunteer depending on whether they rode up or down the escalator.

Another problem is connected with the fact that in this experiment the assumption was that the notion of vertical movement (and so bodily experience) will trigger the concepts of good or bad (and so abstract notions). However, Meier and Robinson [158] suggested that the activation of spatial dimension itself does not activate abstract concept as the metaphorical mappings are asymmetrical - the conceptual thought is created on the base of sensory experience, but not the other way around. Taking this into consideration, one should expect that the escalator manipulation should not have an impact on abstract concepts but rather activation of the abstract thought should induce changes in physical experience. In other words - as the direction of the relationship arises from conceptual thought to sensory experience, according to Meier and Robinson, only changes in abstract concepts should induce changes in physical experience. However, their conclusion does not seem to be the only possible interpretation of the theory of conceptual metaphor. Though Lakoff and Johnson [13] argued that conceptual thought arises from sensory experience, but not the opposite, this is rather a claim about how metaphors develop, and not about the direction of mutual relations. Additionally, research on purity metaphor and disgust suggests that the relationship between abstract and concrete concepts can be bidirectional (see, for instance, [5])

We acknowledge that the design of the experiment suffers from the Clever Hans effect in that the behaviour of the experimenter, who knew the research hypothesis, could have influenced the participants' response [25]. So a future extension would be to repeat the study with an experimenter who is blind to the purpose of the study.

Finally, there was the issue of informed consent. Given that the experiment was designed as a field study, it was difficult to get informed consent and to arrange for a debriefing session [6]. But we would like to point out that in this experiment no harm was done to the participants, and the experiment did not take much of their time. Similar volunteering actions have been performed in the past by different charity organisations. No debriefing was offered because it could have influenced the reliability of the charity institution. A similar research methodology was used in experiment by Lobel et al. [7], where volunteering behaviour was measured in different conditions. In that case informed consent was not obtained and debriefing was not offered.

#### F. Conclusions and future implications

The results of the studies presented suggest that verticality metaphor indeed influences social judgment, both in terms of deliberate and conscious opinion about moral behaviour and also when it comes to rather automatic and

rapid judgment. These findings are in line with Lakoff and Johnson’s theory of conceptual metaphor as they show that activation of the notion of up/high corresponds with the concept of moral/good while down/low metaphor activates the notion of immoral/bad.

A basic theoretical assumption of the above study is broadly related to cognitive linguistics, where it is assumed that language is embodied and situated in a certain environment. Vertical metaphor is understood as an embodied representation that arises when one interacts with the environment and influences the way people speak and think about morality. A possible implications of this phenomenon could be found in the field of cognitive infocommunications. Grounding linguistic communication between an artificial system and a human user in embodied paradigm have two basic consequences: 1) it makes the communication more intuitive for the user, and 2) incorporating human cognitive mechanisms in a computer program makes it more human-like. Cognitive systems could also benefit from the fact that humans process positive information faster when presented at the top and negative information when presented at the bottom - by making information sharing more efficient [1].

APPENDIX

A. Questionnaire: version 1

Adam steals food from another man during famine and his family starvation	-3	-2	-1	0	1	2	3
Tim doesn’t look for a job while receiving unemployment benefit	-3	-2	-1	0	1	2	3
Anna spends more time with her children than with her dying mother	-3	-2	-1	0	1	2	3
Jeremy blames his family for his defeats	-3	-2	-1	0	1	2	3
Susi comes from a poor family. She married a rich man who she doesn’t love but he supports her family financially	-3	-2	-1	0	1	2	3

In the second version of the questionnaire 'Susi's case' was presented at the top and 'Adam's case' was presented at the bottom.

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