Emergence of Spatial Metaphor in Children
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EXPERIMENT ONE:
Do children have the mental metaphor ‘Good is Up’?

Methods
Participants. 114 English-speaking children completed two diagram tasks (Mean Age=7.4, SD=1.3), yielding analyzable data from 81 children in the first task and 95 children in the second task.

Procedure. Children responded to positively and negatively framed questions in both tasks. Diagrams were presented one at a time, oriented vertically against a table-top easel.

Explicit Spatialization Task: Toy Boxes
A picture of a bookcase with two boxes along the vertical axis was presented, and the children were asked to point to the box where they would put (1) a toy they like to play with, and (2) a toy they do not like to play with (or vice versa)

Incidental Spatialization Task: Animals
Two pairs of animals drawn along the vertical axis were presented, and the children were asked to judge the animals’ friendliness (“Which animal is nicer/meaner?”) or intelligence (“Which animal is smarter/dumber?”). Animals’ up/down location, order of presentation and perception valence were counterbalanced across participants.

EXPERIMENT ONE RESULTS
Kids’ vertical valence metaphors mirror patterns in language and bodily experience.

Across Tasks: 72% of responses followed a good=up pattern. Wald X²=24.4, df=1, p<.0001.

Vertical Boxes Task
Boxes: 81% of responses followed an up=good pattern. Wald X²=14.5, df=1, p<.0001.

Vertical Animals Task
Animals: 55% of responses followed an up=good pattern. Wald X²=7.39, df=1, p=.007.

Children implicitly associate Good with UP.

EXPERIMENT TWO:
Where do mental metaphors come from?

Two potential sources:
Correlations in Linguistic Experience: We talk about being ‘on top of the world’ or feeling ‘down in the dumps’.
Correlations in Bodily Experience: We stand upright when happy and slouch when sad.

Linguistic and bodily accounts make the same prediction for vertical mental metaphors: Up = good in both our language (‘high spirits’) and body (upright posture).

Can we distinguish possible effects of Linguistic Experience and Bodily Experience?

For mental metaphors that link valence with vertical space, these sources of experience seem inextricable. To tease them apart, we investigated mental metaphors that link valence with horizontal space, comparing right- and left-handers.

In language, good is associated with right (e.g., my right hand man, ‘two left feet’). In bodily experience, we interact with our environment more fluently with our dominant hand. Do we come to associate good things with our dominant side?

Predictions
If children’s mental metaphors from horizontal space to valence are based on linguistic experience, then they will show a good is right bias.

But if mental metaphors for valence are based on bodily experience (asymmetries in motor fluency), then righties will show a good is right bias but lefties will show a good is left bias.

Methods
Participants. Children from Exp One (12 lefties, 102 righties) were Procedure. Identical to Exp One except the toy boxes and animals were arranged left-right within each diagram.

EXPERIMENT TWO RESULTS
Kids’ horizontal valence metaphors are body-specific.


Handedness modestly predicts direction of space-valence mappings. Wald X²=8.64, df=1, p<.001.


Righties associate Good with Right. Lefties associate Good with Left.

CONCLUSIONS

Vertical Mental Metaphors
• Children implicitly associate good with up and bad with down.
• This mapping could arise due to patterns of linguistic experience or bodily experience (or both).
• The relative contributions of linguistic/cultural and bodily experience remain unknown.

Horizontal Mental Metaphors
• Right-handed children implicitly associate good with right, but left-handers associate good with left.
• The lefties’ data (and the interaction) cannot be explained by patterns in language or culture.
• Some mental metaphors are body-specific (Casasanto, 2009), varying with body-world interactions.

REFERENCES


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