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BASICS

Abstract Thoughts? The Body Takes Them Literally

By [NATALIE ANGIER](#)

The theory of relativity showed us that time and space are intertwined. To which our smarty-pants body might well reply: Tell me something I didn't already know, Einstein.

Researchers at the University of Aberdeen found that when people were asked to engage in a bit of mental time travel, and to recall past events or imagine future ones, participants' bodies subliminally acted out the metaphors embedded in how we commonly conceptualized the flow of time.

As they thought about years gone by, participants leaned slightly backward, while in fantasizing about the future, they listed to the fore. The deviations were not exactly Tower of Pisa leanings, amounting to some two or three millimeters' shift one way or the other. Nevertheless, the directionality was clear and consistent.

"When we talk about time, we often use spatial metaphors like 'I'm looking forward to seeing you' or 'I'm reflecting back on the past,'" said Lynden K. Miles, who conducted the study with his colleagues Louise K. Nind and C. Neil Macrae. "It was pleasing to us that we could take an abstract concept such as time and show that it was manifested in body movements."

The [new study](#), published in January in the journal *Psychological Science*, is part of the immensely popular field called embodied cognition, the idea that the brain is not the only part of us with a mind of its own.

"How we process information is related not just to our brains but to our entire body," said Nils B. Jostmann of the University of Amsterdam. "We use every system available to us to come to a conclusion and make sense of what's going on."

Research in embodied cognition has revealed that the body takes language to heart and can be awfully literal-minded.

You say you're looking forward to the future? Here, Ma, watch me pitch forward!

You say a person is warm and likable, as opposed to cold and standoffish? In one recent study at [Yale](#), researchers divided 41 college students into two groups and casually asked the members of Group A to hold a cup of hot coffee, those in Group B to hold iced coffee. The students were then ushered into a testing room and asked to evaluate the personality of an imaginary individual based on a packet of information.

Students who had recently been cradling the warm beverage were far likelier to judge the fictitious character as warm and friendly than were those who had held the iced coffee.

Or maybe you are feeling the chill wind of social opprobrium. When researchers at the University of Toronto instructed a group of 65 students to remember a time when they had felt either socially accepted or socially snubbed, those who conjured up memories of a rejection judged the temperature of the room to be an average of five degrees colder than those who had been wrapped in warm and fuzzy thoughts of peer approval.

The body embodies abstractions the best way it knows how: physically. What is moral turpitude, an ethical lapse, but a [soiling](#) of one's character? Time for the Lady Macbeth Handi Wipes. One study showed that participants who were asked to dwell on a personal moral transgression like adultery or cheating on a test were more likely to request an antiseptic cloth afterward than were those who had been instructed to recall a good deed they had done.

When confronted with a double entendre, a verbal fork in the road, the body heeds [Yogi Berra's](#) advice, and takes it. In a [report published last August](#) in Psychological Science, Dr. Jostmann and his colleagues Daniel Lakens and Thomas W. Schubert explored the degree to which the body conflates weight and importance. They learned, for example, that when students were told that a particular book was vital to the curriculum, they judged the book to be physically heavier than those told the book was ancillary to their studies.

The researchers wanted to know whether the sensation of weightiness might influence people's judgments more broadly.

In a series of experiments, study participants were asked to answer questionnaires that were attached to a metal clipboard with a compartment on the back capable of holding papers. In some cases the compartments were left empty, and so the clipboard weighed only 1.45 pounds. In other cases the compartments were filled, for a total clipboard package of 2.29 pounds.

Participants stood with either a light or heavy clipboard cradled in their arm, filling out surveys. In one, they were asked to estimate the value of six unfamiliar foreign currencies. In another, students indicated how important they thought it was that a university committee take their opinions into account when deciding on the size of foreign study grants. For a third experiment, participants were asked how satisfied they were with (a) the city of Amsterdam and (b) the mayor of Amsterdam.

In every study, the results suggested, the clipboard weight had its roundabout say. Students holding the heavier clipboard judged the currencies to be more valuable than did those with the lightweight boards. Participants with weightier clipboards insisted that students be allowed to weigh in on the university's financial affairs. Those holding the more formidable board even adopted a more rigorous mind-set, and proved more likely to consider the connection between the livability of Amsterdam and the effectiveness of its leader.

As Dr. Jostmann sees it, the readiness of the body to factor physical cues into its deliberations over seemingly unrelated and highly abstract concerns often makes sense. Our specific clipboard savvy notwithstanding, "the issue of how humans view gravity is evolutionarily useful," he said.

"Something heavy is something you should take care of," he continued. "Heavy things are not easily pushed around, but they can easily push us around." They are weighty affairs in every tine of the word.

The cogitating body prefers a hands-on approach, and [gesturing has been shown to help children](#) master math.

Among students who have difficulty with equations like $4 + 5 + 3 = _ + 3$, for example, performance improves markedly if they are taught the right gestures: grouping together the unique left-side numbers with a two-fingered V, and then pointing the index finger at the blank space on the right.

To learn how to rotate an object mentally, first try a pantomime. “If you encourage kids to do the rotation movement with their hands, that helps them subsequently do it in their heads,” said Susan Goldin-Meadow of the [University of Chicago](#), “whereas watching others do it isn’t enough.”

Yesterday is regrettable, tomorrow still hypothetical. But you can always listen to your body, and seize today with both hands.

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