

Science Education Collection

# Manipulating an Independent Variable through Embodiment

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## Overview

Source: Laboratories of Gary Lewandowski, Dave Strohmets, and Natalie Ciarocco—Monmouth University

In any experiment, the researcher attempts to manipulate participants in one group to have different thoughts, experiences, or feelings than the other groups in the study. Some manipulations are overt, while others can be quite subtle. Embodiment is a growing research area focused on the theory that subtle physical experiences can unconsciously influence a person's thoughts. For example if a person physically smiles, it often leads to elevated mood. That is, the physical experience of smiling changes the way a person feels.

This video uses a two-group experiment to see if the physical sensation of weight will lead people to be stricter by giving harsher forms of discipline to fellow students who violated campus policies.

## Procedure

### 1. Define key variables.

1. Create an operational definition (*i.e.*, a clear description of exactly what a researcher means by a concept) of embodiment, or embodied cognition.
  1. For the purposes of this experiment, embodiment, or embodied cognition, involves the participant directly experiencing the physical sensation of weight in a non-obvious way that can unconsciously influence cognitions.
2. Create an operational definition (*i.e.*, a clear description of exactly what a researcher means by a concept) of discipline.
  1. For purposes of this experiment, discipline is defined as the severity of sanctions or punishment that a participant feels a fellow student should receive following a violation of campus policy (*e.g.*, drinking underage).

### 2. Conducting the study

1. Meet student/participant outside of the library.
2. Provide participant with informed consent, a brief description of the research (getting students' opinions on appropriate forms of discipline for campus conduct violations), a sense of the procedure, an indication of potential risks/benefits, the right of withdrawal at any time, and a manner to get help if they experience discomfort.
3. Have the participant sign the informed consent form on researcher's textbook in a way that the participant does not have to hold anything except the pen.
4. Tell participant that you would like him/her to complete a written survey and to make the task easier, he/she can fill it out using a clipboard.
5. The researcher should hand the participant the clipboard to hold, while the researcher takes 10 s to look for the proper survey in her bag.
  1. Heavy clipboard has ~ 5 lb weight inside/attached.
6. The researcher will then give the participant the survey and ask the participant to complete it (participant remains standing).
7. The survey asks the participant to indicate her/his thoughts on the appropriate level of punishment for various campus infractions such as vandalism, plagiarism, or cheating on a test (**Figure 1**).

**The Student Judicial Affairs Office on campus is looking for students' feedback regarding the appropriate levels of discipline for common violations of the student code of conduct. For each of the following please indicate what you think is most appropriate for a first time offender.**

1	2	3	4	5
Verbal Warning	Written Warning	Incident Documented in Student's File	Documented One-Week Suspension	Expelled from the University

- \_\_\_\_\_ 1) Plagiarism
- \_\_\_\_\_ 2) Cheating on a Test
- \_\_\_\_\_ 3) Excessive Noise in the Dorm
- \_\_\_\_\_ 4) Underage Drinking
- \_\_\_\_\_ 5) Use of a Fake ID
- \_\_\_\_\_ 6) Illegally Downloading Copyrighted Material
- \_\_\_\_\_ 7) Vandalism

**Figure 1: Sample student opinion survey given to participants.**

### 3. Debrief.

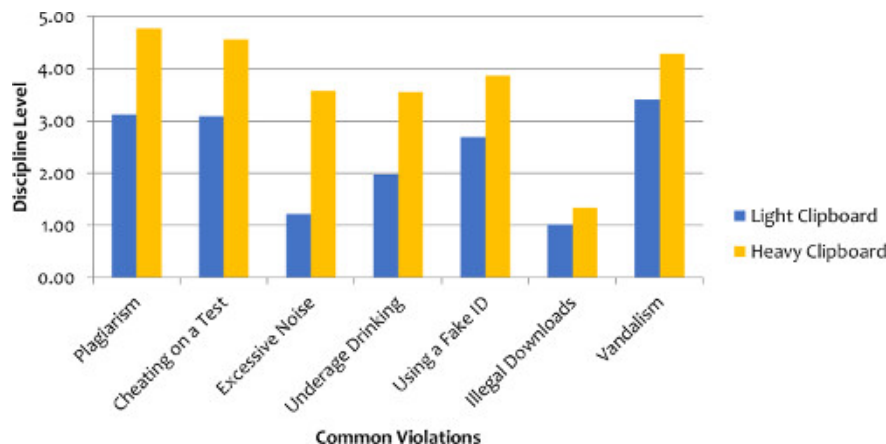
1. Participant is told the nature of the study.
  1. "Thank you for participating. In this study I was trying to determine if the experience of weight through holding something heavy would influence severity of discipline. There were two groups in the study, one group held a heavy clipboard, the other group held a standard clipboard. We hypothesized that those in the heavy clipboard condition would be stricter in their discipline by giving harsher penalties."
  2. "We could not tell you about our hypotheses ahead of time because this process (what psychologists call embodied cognition) is an unconscious process that occurs outside of your awareness. Because of the nature of the deception, it is quite natural for participants to not realize that they were being deceived."

**4. Go through the "Conducting the study" procedure twice, with two different participants (one per condition). Once for a person completing the survey with a heavy clipboard, and once for a person completing it with a standard clipboard. The idea is that we are highlighting one participant per condition, but that in running a real version of the study there would be 61 per condition.**

## Results

The data were collected from 122 participants. Recall that the discipline scale is calculated on the number assigned to each of the levels of discipline (e.g., 1 = verbal warning, etc.). To determine if there were differences between the heavy and light clipboard conditions on discipline levels, we performed a t-test for independent means.

The results indicated that participants who held the heavy clipboard gave stricter levels of discipline for 6 of the 7 violations (**Figure 2**). The only exception was for illegal downloading of copyrighted material, which did not demonstrate a significant difference between conditions.



**Figure 2: Discipline level for common violations by weight condition.**

## Applications and Summary

This two-group experiment shows how researchers can manipulate participants' cognition in a subtle way that participants are not aware of through embodiment.

This study replicates and extends previous research on embodiment by Jostman *et al.*, which showed that holding a weighted clipboard made participants think that fair decision-making through listening to students' opinions was more important.<sup>1</sup>

Embodiment effects are increasingly popular and have been studied in a variety of contexts. For example, a recent study by Kille *et al.* in Psychological Science found that participants who sat at a wobbly desk (which the researchers created by sawing two of the legs short) sought romantic relationship partners who were more stable (*i.e.*, reliable and trustworthy).<sup>2</sup>

## References

1. Jostmann, N. B., Lakens, D., & Schubert, T. W. Weight as an embodiment of importance. *Psychological Science*. 20(9), 1169-1174. doi:10.1111/j.1467-9280.2009.02426.x (2009).
2. Kille, D. R., Forest, A. L., & Wood, J. V. Tall, dark, and stable: Embodiment motivates mate selection preferences. *Psychological Science*. 24(1), 112-114. doi:10.1177/0956797612457392 (2013).