

JoVE: Science Education
Thinking Too Much Impairs Decision-Making
--Manuscript Draft--

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Science Education Title: Thinking Too Much Impairs Decision-Making

Overview

When we are considering a tough choice between two or more attractive options, we often end up actively weighing the pros and cons of each alternative. By reflecting on their advantages and disadvantages, we attempt to fit a complex, subjective decision into an orderly set of criteria. However, research in psychology suggests that this sort of introspective approach might not always yield the most optimal outcomes ~~(Wilson & Schooler, 1991).~~¹

In other words, sometimes thinking hard about a problem or a choice may not produce desired results. Similar results have been demonstrated in the domains of emotion (participants who ruminated about a bad mood showed less mood improvement than participants who were merely distracted from their mood;² ~~Morrow and Nolen-Hoeksema, 1990~~) and memory (verbalizing the details of a criminal's face led to poorer recognition in a photo array of possible suspects; ~~Schooler and Engstler-Schooler, 1990~~).³ Furthermore, Wilson and colleagues observed that reflecting on the reasons behind one's attitudes (*i.e.*, considering "why" one feels a certain way) can disrupt the consistency between attitudes and behavior, and can even change attitudes ~~(see Wilson, Dunn, Kraft, & Lisle, 1989).~~⁴

Why might this be the case? Wilson and colleagues speculate that often we don't typically have a very good understanding of why we actually feel the way we do ~~(e.g., Nisbett & Wilson, 1977).~~⁵ Upon introspection of our feelings, we may hone in on irrelevant but salient details that may offer plausible explanations, but may also have little direct influence on our actual attitudes. Wilson and Schooler devised an experiment designed to test this possibility in the domain of subjective preferences. Specifically, they compared participants' evaluations of a series of jams with experts' evaluations, and tested whether asking participants to analyze the reasons for their choices would have a negative impact on their evaluations.

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Principles

This investigation capitalizes on what might be termed the **unreliability of introspection**, or the **introspection illusion**. Evidence in social psychology suggests that we have very little direct access into the mental processes giving rise to our perceptions and behavior ~~(Nisbett & Wilson, 1977).~~⁵ When we attempt to introspect on these processes, we often miss the mark—providing plausible but inaccurate post-hoc explanations based on implicit **causal theories** of what is most likely to have affected our mental states.

Procedure

1. Conduct a power analysis and recruit a sufficient number of participants and obtain informed consent from the participants.
2. The study will require two experimenters—one to administer the jam taste test, and another (blind to condition) to obtain participants' ratings of each jam.
3. Recruit volunteers for a study entitled "Jam Taste Test". Instruct volunteer subjects not to eat anything for 3 hours prior to the study.
4. Purchase five brands of strawberry jams or preserves that vary in their overall quality. To provide participants with a large range of jam quality, the original researchers purchased the 1st-, 11th-, 24th-, 32nd-, and 44th-ranking jams in a report produced by *Consumer Reports* magazine of 45 different jam brands ("Strawberry Jams," 1985). This report contained expert rankings based on the ratings of seven consultants who were trained sensory panelists. Each expert consultant rated 45 jams across 16 specific sensory characteristics, such as sweetness, aroma, *etc.* (Averages were calculated across all seven expert consultants' ratings to yield rankings of all 45 jams.)
5. Prior to running each participant, set up the ~~running-testing~~ room. You'll need a table, a chair, plates, spoons, jams, labels, and a trash can. Arrange the five jams in a random on the table, labeled A through E. Keep track of which jam receives which label for each participant, and in which order the jams are arranged. Take one teaspoon of Jam A and place that spoonful on a plate in front of the Jam A jar. Repeat for Jams B through E.
6. Participants should be run individually. Experimenter 1 should inform each participant that the purpose of the study is to evaluate different kinds of jams under different conditions, as part of a consumer psychology experiment. Explain that some participants will taste jams on crackers, while others will taste jams on plastic spoons. Critically, inform the participant that they have been randomly assigned to the condition in which they'll be tasting jams on spoons. Specifically, after tasting the jams, they will rate their liking for each one.
7. ~~The Have each~~ participant ~~should now~~ sign a consent form, giving their informed consent to participate.

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8. ~~The participant is now r~~Randomly assign ~~participants~~ed to either the “reasons-analysis” condition, or a control condition.

8.1 Provide “reasons-analysis” participants with written instructions asking them to “analyze why you feel the way you do about each” jam,” in order to prepare yourself for your evaluations.” Inform these participants that they will be asked to list their reasons for liking or disliking each jam after tasting. Describe this task as a means of organizing participants’ thoughts prior to rating, and further, inform participants that they will not be asked to hand in their list of reasons.

8.2 The rest of participants (e.g., control participants) should not receive any additional instructions.

9. Ask participants to be seated at the table where the five jams have been arranged. spoon with approximately 1 ~~teaspoon-tsp~~ of strawberry jam.

9.1 For “reasons-analysis” participants, Experimenter 1 should ask the participants to taste each of the five jams. During the tasting, leave the room. Upon returning, administer the reasons questionnaire. This questionnaire should ask participants to list their reasons for liking or disliking each of the Jams A through E. Reiterate that the purpose of the questionnaire is to organize the subjects' thoughts and that they would not be asked to hand it in. Leave the room once again. Upon returning, explain that the completed questionnaire will no longer be needed, and should put the questionnaire in the trash can.

9.2 For control participants, Experimenter 1 should also ask the participants to taste each of the five jams, and during tasting, should leave the room. Upon returning, administer a filler questionnaire instructing participants to list reasons why they chose their major, and leave the room once again. Upon returning, collect the completed filler questionnaire.

10. Experimenter 1 should now introduce the participant to Experimenter 2, who must be unaware of the condition that the participant was assigned to.

11. Experimenter 2 should administer a questionnaire to the participant asking them to evaluate each of the jams on a 9-point scale ranging from *disliked* (1) to *liked* (9). Instructed participants to complete the questionnaire and to place it through a slot in a covered box on the table, to maintain anonymity. Leave the room while participants are completing this questionnaire, and upon returning, fully debrief the participant regarding the purpose and procedures of the study.

Analysis

After running all participants, the critical analyses are a) to test whether evaluations of the jams varied between participants in the “reasons-analysis” condition (e.g., those who

analyzed how they felt about the jams) and those in the control condition (e.g., those who did not) via a 2 (condition: reasons analysis vs. control) x 5 (jams 1, 2, 3, 4, ~~and~~ 5) multivariate ANOVA, and more critically, b) to compare the degree of agreement with expert ratings between participants in the “reasons-analysis” condition and those in the control condition.

To perform this second analysis, simply compute the Spearman’s rank-order correlation between each participant’s subjective ratings of each jam and the expert ratings of each jam, on a subject-by-subject basis. Convert these values to z-scores via Fisher’s r-to-z transformation for purposes of analyses, and perform a) an independent-samples *t*-test examining how the average participant/expert correlation varies as a function of group, b) two one-sample *t*-tests comparing the average participant/expert correlation in the “reasons-analysis” condition and the control condition against zero separately¹.

Representative Result

In the original Wilson and Schooler (1991) investigation, the authors observed that asking participants to think about their reasons for their evaluations did indeed change their ratings of the set of jams, as compared to the ratings given by control participants.

Critically, when comparing against the objective criterion (e.g., experts ratings), the average correlation between “reasons-analysis” participants’ ratings and experts’ ratings was significantly lower than the average correlation between control participants’ ratings and experts’ ratings. Moreover, while this average correlation between participants’ and experts’ ratings was significantly greater than zero in the control condition, in the “reasons-analysis condition,” it was not.

Summary

Based on these results, the authors concluded that while the control participants formed jam preferences that were very similar to an objective criterion of quality (e.g., experts’ ratings), participants who spent time deliberating about the reasons supporting their evaluations showed much less correspondence with this criterion. The authors suggest that these participants’ preferences were influenced by the process of introspection, which likely caused them to focus on salient, but ultimately irrelevant attributes of the jams.

¹ These analyses describe the primary procedures carried out by the original authors. The authors also recovered each participant’s “reasons analysis” questionnaire from the trash can and coded it for the quantity and quality of reasons provided (e.g., what aspects of the jams did each participant focus on, how much subjective liking was conveyed in the reasons listed), and performed some supplementary analyses using these data.

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Applications

The results of this study have clear implications in the marketing domain, and for consumers in general. Introspecting on one’s preferences—specifically on the *reasons* supporting those preferences—may lead to less-than-optimal decision-making. In other words, a consumer who exhaustively deliberates on the pros and cons of a choice may end up feeling less satisfied with the ultimate results of that choice (e.g., see Wilson et al., 2003).

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These principles may also be extrapolated to other complex decision domains (e.g., legal, economic, and even interpersonal decision-making), though testing the boundary conditions of these results is critical. One could examine how manipulating various aspects of the choice architecture (e.g., the number of alternatives the participant is considering, the objective range of alternatives, the average quality of alternatives, etc.) or the instructions (e.g., asking participants to focus on abstract versus concrete reasons, pitting a “reasons analysis” against a “feelings analysis”, etc.) might exaggerate or attenuate this pattern of results. One could also test the degree to which these results generalize to other decision domains or attitude objects, or consider individual differences in these effects. For e.g., example, one might ask for whom will introspection *not* have a deleterious effect? One possibility is that people who enjoy thinking will prefer to engage in introspective and it might even lead to better outcomes, and why?. Of course, this is a question for future research.

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Legend

Figure 1. Mean liking ratings for the five jams as a function condition. Average liking ratings provided by participants in the Control (left) and Reasons conditions (right) are displayed for all five jams. Jam 1 was the top ranked jam, based on experts’ ratings. Jams 2, 3, 4, and 5 were the 11th-, 24th-, 32nd-, and 45th-ranked jams, respectively. Participants were more accurate in rating the jam in the Control condition (left).

Figure 2. Average correlation between participants’ ratings and experts’ ratings as a function of condition. Bars represent the average correlation between participants’ ratings of jam liking and experts’ rankings, as a function of whether they were in the Control (left) or Reasons condition (right). Within-participant correlations were Fisher-transformed and then compared against zero and against each other. The average correlation in the Control condition was different from zero, and significantly stronger than the average correlation in the Reasons condition, which was not different from zero.

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