The "Mozart Effect": A Psychological Research Methods Case

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Part I—Enhanced Performance?

"Hey, Bill, what are you listening to?" asked Fred.

"I'm listening to these CDs of classical music that I bought. They're supposed to help me concentrate more and become more creative," answered Bill.

Fred frowned. "How can listening to classical music do all of that? Where did you hear about this?"

"Well, I was flipping through this magazine at my girlfriend's house and I saw this ad where you could buy these CDs that are supposed to stimulate the right side of your brain and improve your ability to concentrate and stuff," said Bill.

"And how much did you pay for these CDs?"

"Just $45, and there's a money back guarantee if they don't work. In the ad it said that some researchers found that listening to this music made people do better on different mental tests and that it made your brain release these chemicals that made you feel better," Bill said excitedly.

Fred still felt a little skeptical about the power of Bill's new CDs. "So, what else did the ad say?"

"All kinds of cool things. Like, when they played the music for these cows, they gave more milk, and immigrants who were learning English learned faster when they listened to the music, and, this one is really cool, when they played the music next to this yeast, it made better sake," said Bill.

Fred laughed. "So, have you been giving more milk or what?"

"Hey, don't make fun of me. I haven't been doing so great in some of my college classes so I figured I might as well give it a chance," Bill answered. "Here, you can check it out for yourself on this website at http://www.springhillmedia.com/b.php?a=DCAMPBELL.

"You know, this might just be the kind of thing I could do for my project in my research methods class. Our professor is encouraging us to be more skeptical about claims just like this one. We've been talking about something called the principle of falsifiability," Fred said.

"The principle of what-ability?" asked Bill.

"The principle of falsifiability. It's a scientific term, which basically says that when we study something,

like whether these CDs improve concentration and creativity, we have to do it in a way that will allow us to confirm whether the prediction is false. So, if people study this effect using the scientific method and they don't find that the CDs improve concentration and creativity, then we have to accept that there's no truth to the claim being made by the person who produced them," replied Fred.

"Well, that makes sense to me. You know, I think I want to help you with this study. I already have the CDs, so maybe it would be kind of cool to be part of a scientific study. What do we do next?" asked Bill.

Fred and Bill need to figure out how they can determine if listening to classical music really will produce the kind of effects that the product's maker claims. Fred and Bill decide to go visit Fred's psychology professor to see what she thinks about their study idea.

Questions

Answer the following questions based on Bill's description of the advertisement and the information on the website:

1. What claims are made for the product?
2. Is there evidence to support the claims?
3. What suggestions do you have for Fred and Bill?
4. How can Fred and Bill find out if there's any published evidence to substantiate the claims?
5. Evaluate the quality of the information presented on the website. The table below, which distinguishes between characteristics of non-scientific and scientific ways of acquiring knowledge, should be used to help you organize your response. For example, decide whether the observations posted on the website are based on a handful of anecdotes or rather on systematic, controlled experiments. Next, evaluate whether the reporting of results is biased and subjective, or unbiased and objective. Apply each category in turn and use the dialogue between Bill and Fred to justify your conclusions.

	Characteristics of a non-scientific, "everyday" approach to experience	**Characteristics of a scientific approach to experience**
Observation:	Casual, uncontrolled	Systematic, controlled
Reporting:	Biased, subjective	Unbiased, objective
Concepts:	Ambiguous, with surplus meanings	Clear definitions, operational specificity
Instruments:	Inaccurate, imprecise	Accurate, precise
Measurements:	Not valid or reliable	Valid, reliable
Hypotheses:	Untestable	Testable
Attitude:	Uncritical, accepting	Critical, skeptical
General Approach:	Intuitive	Empirical

Adapted from Shaughnessy, J.B., E.B. Zechmeister, and J.S. Zechmeister. *Research Methods in Psychology*, 6th ed., 2003. New York: McGraw-Hill.

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Part II—Outlines of an Experiment

Encouraged by Fred's psychology professor, Fred and Bill decide to conduct an experiment to test the effectiveness of the classical music CDs. Outline an experiment that they could conduct. Be sure to address the following:

1. What is the research question that Fred and Bill want answered?

2. What would the scientific hypothesis be?

3. What independent variable(s) could be tested?

4. How could the effect of the independent variable(s) be measured? In other words, what should the dependent variable(s) be?

5. What other variables should be controlled and how should this be done? Describe control procedures that Fred and Bill may want to use including (but not limited to):
    - holding some variables constant
    - eliminating the effect of some variables
    - choosing a random sample
    - randomly assigning participants to groups (levels of the independent variable)

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Part III—Research Report Analyses

(A) Rauscher *et al.*

Fred and Bill did a literature review and one of the research reports they found was from *Nature* (see: Rauscher, F.H., *et al.*, 1993, "Music and spatial task performance," *Nature* 365: 611). Read this report and respond to the following:

1. Identify the independent variable(s).
2. Identify the dependent variable(s).
3. What aspects of the study did the researchers control? What aspects did they fail to control?
4. What were the results of the study?
5. What conclusions do the researchers reach?
6. Based on the design and results of this study, do you believe that the researchers are justified in reaching these conclusions? Why or why not?
7. Now look at the study that you and your group designed. Did you control for any of the problems present in the Rauscher *et al.* study? If so, what?

(B) Steele *et al.*

Let's take a look at another research report that Fred and Bill found in the journal *Psychological Science* (see: Steele, K.M., *et al.*, 1999, "The mystery of the Mozart Effect: Failure to replicate," *Psychological Science* 10(4): 366–369). Read this report and respond to 1–6 above as they pertain to this article. In addition, point out ways in which this study is an improvement upon the Rauscher *et al.* study.

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Part IV—Replication? (Optional)

As a class project we are going to do our own study to see if we can replicate the study done by Rauscher. We will use the 1993 *Nature* article and the Steele article in *Psychological Science* as well as any additional articles that we come across in a literature review. Your next task is to use the database PsychInfo to conduct a literature review. Spend some time with your group generating some search terms that will be useful for this literature search. Don't forget to include authors' last names as appropriate terms.

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