Experiencing Psychological Processes and Understanding Their Implications

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ABSTRACT This article presents three classroom demonstrations designed to help instructors who would like to include some political psychology in their classes. All three demonstrations involve student participation and give the students direct experience with psychological processes relevant to political science. Specifically, I describe how I present the Stroop task, a priming task, and Tversky and Kahneman's Asian disease experiment in my own teaching. For each of the demonstrations, I give practical advice for classroom use, a short description of the psychological processes the demonstration illustrates, and a brief discussion of how those processes have been applied in political science.

Much of political psychology applies psychological theories to political science questions (Krosnick and McGraw 2002). Often, students never read the original research in psychology. Then they have to believe, on faith alone, that psychological effects are real and strong enough to influence politics. The three demonstrations described in this article allow students to experience several of the psychological findings that have been most influential in political science.

First, through the Stroop task, students experience mental processes that interfere with each other. Next, the accessibility task demonstrates how the operation of people's memory can be influenced by external cues. Finally, Kahneman and Tversky's Asian disease experiment shows students how probability and risk alter the way people make decisions. The rest of this article explains how to give students these experiences and some of the demonstrations' theoretical implications.

INTERFERENCE: THE STROOP TASK

The Stroop task requires two lists of words. In the first list, the color of the words matches the word, so red is in red ink, black is in black ink, yellow is in yellow ink, and so on (see the left column in the example in of appendix A). In the second list, the color names and the color of each word's ink do not match (see the right column of appendix A). The lists can be arranged side by side or on opposite sides of a single piece of paper.[1] First, I begin the experience by distributing the papers to students and asking the students to not look at the papers yet. Then, I ask the students to cover the right column (or place the paper so that side one is facing up). Now they start the task: I ask them to say aloud—*and as quickly as they can*—the color of the ink of each word on the list from top to bottom. The students will complete the entire list rapidly and easily.

Next, I ask the students to flip over the paper or cover up the first column. The task remains the same: they are to say out loud the color of the ink of each word as quickly as they can. This time, however, the colors of the letters and the words they spell do not match. Instead of many voices in unison going quickly down the list with accuracy, the time it takes people to finish the task will vary.[2] Many students will make mistakes and it takes more time to read the list. By the time the bulk of the class gets to the end of the list, giggles and side conversations break out as the students marvel at how difficult this ostensibly identical task is. Nonetheless, it is an enjoyable experience for all those involved. In my experience, students then swivel their attention to the instructor. They are eager for an explanation of what they just experienced.

The Stroop task demonstrates what psychologists call the interference paradigm. The first version of the task is easy because all cues point in the same direction. In the second version, however, two of the brain's systems give different answers. The color-sensing system automatically perceives the colors of the words, as it should. The semantic system automatically perceives the words. Because these two systems are giving different answers about what is on the page, the executive portion of the brain has to adjudicate among the systems and decide which system is presenting the most relevant information to the color-identification task. This extra step takes more cognitive effort and more time to complete, and thus reading the second list takes more time.

The general idea is that the length of time it takes a person to use their memory tells us about how their memory is organized. Things that go together are more easily and quickly retrieved together. When items that do not go together are retrieved for the same task, the brain needs to sort out which is relevant, and this takes the brain extra time.

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Stroop Task: Applications

One of the most fascinating, well-publicized, and politically relevant applications of the interference paradigm is the Implicit Attitudes Test (IAT), which can be completed using any computer connected to the Internet.[3] In the words of one of the principal investigators, "The Implicit Association Test is a flexible task designed to tap automatic associations between concepts (e.g., math and arts) and attributes (e.g., good or bad, male or female, self or other)," (http://projectimplicit.net/nosek/iat/).

The first, and perhaps most provocative use of the IAT, is to measure implicit racial attitudes. In one battery, words are flashed on the screen and the subjects are asked to press one key if a word is good (e.g., happy, joy) and another key if the word is bad (e.g., murder, evil). Then, subjects are shown a series of pictures of people's nose and eye regions, and they are asked to classify the images as belonging to black or white people, using different keyboard strokes, as quickly as possible. All of the preceding stimuli are then presented again in two more rounds. In one round subjects are asked to hit one key if the word/image is either black or good and another key if the word/image is either white or bad. In another round they are asked to hit one key if the word/image is either white or good and another key if the word/image is either black or bad. By comparing the times it takes people to complete these tasks, the IAT determines whether pairing black and good or black and bad is more consistent with what the subject already has in memory. Thus, the test's creators claim that the test's results yield a valid measure of racial attitudes even when subjects are "unwilling or unable" to explicitly report these attitudes (https://implicit.harvard.edu/implicit/demo/background/).

The IAT generates several avenues for classroom discussion. The technique's inventors claim that it is a direct measure of prejudice. The execution and interpretation of this measurement opens up a host of questions concerning the role of psychology in politics, normative questions about the degree to which events that are solely inside the head have political meaning, and epistemological questions concerning interpreting data from the IAT. For example, interpreting the IAT as a pure and direct measure of prejudice has been criticized for assuming that when people have *less* favorable evaluations of an attitude object that this means their evaluations are *un*favorable (see Arkes and Tetlock 2004; Banaji, Nosek, and Greenwald 2004; and Tetlock and Arkes 2004). Massive bibliographies of the research on the IAT are available at the websites dedicated to the IAT (e.g., http://www.projectimplicit.net/articles.php, https://implicit.harvard.edu/implicit/demo/background/bibliography.html, and http://faculty.washington.edu/agg/iat_validity.htm).

One of the best features of the IAT's online presence is that students can take the IAT privately, outside of class, after experiencing the Stroop task. Because the IAT often deals with attitudes that have strong social desirability effects, having a politically and morally neutral introduction to the interference paradigm through the Stroop task allays some students' suspicions that racism tests are tricks and/or always detect racism. Recently, the IAT has been expanded to cover other topics, such as preference in presidential candidates, weight, and sexuality.

ACCESSIBILITY: PRIMING CARROT

Accessibility is another concept linked to retrieving information from memory. Drawing on associative network and spreading activation models of memory, accessibility is based on the idea that when a memory is accessed, it becomes easier to access again. I sometimes think of memory as a thick stew. If you lift some chunk out then drop it back into the stew, and then immediately skim the top, you are likely to get that same chunk again because it takes some time for a chunk to sink back to the bottom. Memory works similarly. Information that has been recently accessed is easier to access again.

The accessibility demonstration can include some showmanship if that is something the instructor enjoys. I begin by asking for a volunteer. I hand the volunteer a sealed envelope that contains a piece of paper with the word "carrot" written on it in large letters. Next, I tell the volunteer that I will read a list of numbers to him or her and that I need the volunteer to repeat the numbers back to me, one at a time, out loud and that after the list of numbers I will ask one question. The volunteer's task is to answer that question as quickly as he or she can. When they are ready, I read a list of numbers such as this one:

14 28 67 37 24 5 11 9 18 56 14 78 24 10 23 18 9 3 18 14

The list needs to contain the numbers 14, 18, and 24 as many times as possible without being obvious. After reading the list of numbers, I say to the volunteer "Name a vegetable," and hope that he or she will say "carrot." After the volunteer responds, I ask her or him to open the envelope and show the paper inside to the class. If the volunteer said carrot then the contents of the envelope are proof that I expected the list of numbers to prime carrot.

The demonstration is based on the fact that 14, 18, and 24 are common karat weights of gold (I try to pick a volunteer who wears gold jewelry to ensure that this association already exists in their memory). Because the sound of the word karat is the same as the sound of the word carrot (i.e., they are homophones), the repeated stimuli related to karat increase karat's accessibility and, because of the similarity in pronunciation, the word carrot is also made more accessible. When I ask the volunteer to name a vegetable, carrot is the name of the most accessible vegetable (if all goes well).

Figure 1 shows how this process is consistent with both associative network and spreading activation memory models. As constructs are accessed in memory, these become more salient and come closer to the "top of the head" or the "tip of your tongue" usage. In addition to the words themselves, accessing a memory also raises the activation of linked memory constructs. It is a bit like plucking a strand on a spider's web; the segment directly touched vibrates the most and the vibration travels to other segments of the web. The farther away a segment is (i.e., the number of nodes that have to be crossed), the less it vibrates. In the same way more distant nodes in memory are activated less. The many mentions of 14, 18, and 24 activate those nodes repeatedly. Their high level of activation is shown in figure 1 by the heavy lines connecting them. The activation energy spreads to related nodes including the words karat and gold. The increase in activation diminishes for each step away from the numbers and so the lines are lighter. Then, when the volunteer is asked to search his or her memory for a vegetable, one possible answer has been activated more recently (if the volunteer's memory has connections among those numbers, karat, and carrot), thus increasing the chance that volunteer one will answer the vegetable question with the word carrot. This is shown in figure 1 by the line from vegetable to carrot being heavier than the lines from vegetable to broccoli, onion, and celery.

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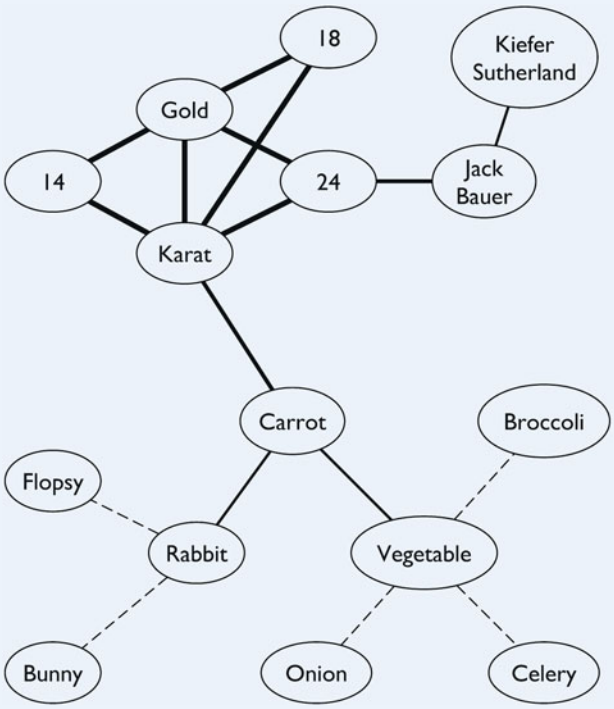
Figure 1



Priming: Applications

Accessibility has several applications in political science. One of the best-known applications is in the area of priming. Iyengar and Kinder (1987) claim that changes in accessibility are the mechanism that causes media priming in their book *News That Matters*. Iyengar and Kinder (1987) argue that the repetition of information about an issue increases its accessibility. In their view, when respondents are asked about their evaluation of the president they more easily retrieve their attitude toward the primed issue. In the same way that repeating the numbers made "carrot" an easier answer to the vegetable question, the primed issue becomes a more easily accessed tool for evaluating the president's performance. As defined in *News That Matters*, media priming occurs when increased news coverage of a particular issue causes that issue to become a larger ingredient in people's evaluations of the president than it would be otherwise.

Understanding the precise definition of accessibility is vital for understanding research on the causes of priming. Only by knowing what does and does not fit with accessibility-based explanations can students validly participate in debates about priming and the questions raised by Miller and Krosnick (2000), Lenz (2009), and others.

FRAMING: THE ASIAN DISEASE EXPERIMENT

My final demonstration of psychological processing is Tversky and Kahneman's (1981) Asian disease experiment. Before class I write two documents (both shown in the following text). One version has "Illness" written at the top and the other has "Flu" at the top. I print enough copies of each version to give one to half the class. Then I shuffle together the two sets of documents. When I pass them out in class, shuffling the two versions together randomly assigns the students to receive the Illness version or the Flu version.

Illness

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

If Program A is adopted, 400 people will die.

If Program B is adopted, there is a 1/3 probability that nobody will die, and a 2/3 probability that 600 people will die.

Which of the two programs would you favor?

_____ Program A _____ Program B

Flu

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved.

If Program B is adopted, there is a 1/3 probability that 600 people will be saved, and a 2/3 probability that no people will be saved.

Which of the two programs would you favor?

_____ Program A _____ Program B

Then I distribute papers from the stack I shuffled together. I tell the students to look only at their own paper, take as much time as they need, and mark their choice, A or B. Then, I write Flu at the top of the board and off to one side with Program A and Program B written under it just as they saw on their sheet and do the same on the other side starting with writing Illness on the top. We go through each of the four possible choices and ask the students who chose each to raise their hands. I tally up the number of students making each choice.

The expected value of all four options is the same (200 people living), so there should not be a strong pattern to the results. Even if there is a difference between certain outcomes and probabilistic outcomes, Program A and Program B offer exactly the same choice in both the Flu version and the Illness version. The only difference is whether the options are framed in terms of loss (people dying) or gains (saving people). In my experience, the distributions fall fairly close to what Tversky, Kahneman, and others (Druckman 2001) have found: when the choice is between guaranteed gain (saving 200 people) and a risky option (a one-third chance of saving everybody), people tend to choose the guaranteed gain. In contrast, when the choice is between a guaranteed loss (400 will die) and a risky option (a one-third chance that nobody will die), people tend to choose the risky option (Druckman 2001). These response patterns appear consistently when the original experiment's design is followed. Deviations from the original experiment reduce the size of the framing effect (Kühberger 1998; Kühberger et al. 1999).

Asian Disease Experiment: Applications

The point to make to students is that how alternatives are framed affects what people choose, even when the outcomes are actually

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identical. People deal with risk and uncertainty in ways that depart from pure cost-benefit analysis, but that are nonetheless systematic and predictable. This finding has obvious implications for campaigns and media. This experiment directly leads to the work on equivalence framing pursued by James Druckman and Dennis Chong (Druckman 2001; Druckman and Chong 2007). Preference reversals and reactions to uncertainty (Kahneman and Tversky 1979) directly led to Kahneman's Nobel Prize and to prospect theory, which continues to influence political science, especially the subfield of international relations.

Prospect theory is not a fad. It was introduced in the 1980s and 1990s (Quattrone and Tversky 1988; Levy 1992, 1997), weathered critiques and reexamination in the 2000s (McDermott 2001, 2004; Mercer 2005), and continues to drive new research (Asgary and Levy 2009; McDermott, Fowler, and Smirnov 2008). Because of their direct experience, the students realize that these effects are not something that "happen" to other people. Their own minds also work this way.

The flu outbreak experiment differs from the interference and accessibility demonstrations in some interesting respects. This task does not ask the students to make a quick decision and does not overwhelm them with information. This point is important because sometimes it seems that "psychology" only matters when people do not devote their full attention to their decisions.

PRACTICAL EXPECTATIONS AND CONCLUSION

The Stroop task and the flu outbreak demonstration have never failed me, but the carrot priming test only "works" (i.e., the volunteer answers the vegetable question by saying "carrot") about two thirds of the time. When it does not work, I explain to the class what I expected to happen and then we discuss what vegetable names went through the head of the volunteer and through the heads of the rest of the class as well. There are also some more direct demonstrations. Here is one that always "works." Ask a volunteer to answer two questions as rapidly as they can. When the volunteer agrees, ask them to spell the word "silk." As soon as they finish ask, "What do cows drink?" (most people will say "milk").

These three experiences allow students to have direct experience with some of the processes that we teach. Student may continue to see them as tricks, but they do realize that these are tricks that "work" on them. These experiences are not things that only happen to other people. It is also important to note that the ways that these demonstrations turned out were systematic and very predictable, even if they were surprising. ■

NOTES

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1. For online classes, the Stroop task could be delivered as a pdf or using one of the Internet versions of the Stroop task. A list of online resources can be found at the Stroop task's Wikipedia page at http://en.wikipedia.org/wiki/Stroop_task.
2. This can be useful for explaining the difference between states (external or situational influences on behavior) and traits (internal or dispositional influences on behavior). Changing the task (i.e., changing their external stimuli) affects all of the students, but they are not all affected in the same way or to the same degree. Internal aspects (e.g., differences in their ability to focus on a task) cause variation across people (otherwise, they would all slow by the same amount and their voices would still be in unison). This allows the instructor to demonstrate both aspects of a distinction that comes up many times in the social sciences: structure versus agency; nurture versus nature; environment versus personality; etc.
3. For a list of other implicit measures, including the AMP used in the 2008 American National Election Study, see http://www.bgu.ac.il/~baranany/imp.html.

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APPENDIX A: The Stroop Task

Note: For a color version of this image, please check http://www.journals.cambridge.org/psc2011001.

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