Applying Cognitive Psychology Methods Activity 1: Attention

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Visual Search Task

This study was designed to study how *search*—scanning of the environment for particular features—functions. To be more specific, the researchers utilized *conjunctive search*—sifting through a combination (or conjunction) of two or more features in the same stimulus—in their experimentation to highlight a specific subset of search.

During the experimentation my goal was to identify an upright red 'T'. In the procedure, I was to focus on a white cross that would briefly flash. After the flash, a varying number of upside down red 'T's that were presented for me to search through. Additionally, there would be blue upright 'T's that were designed to mimic the orientation of the target—the upright red 'T'. In some cases, the upright 'T' would not be present among the noise, but when it was, I would be signaled to press the space bar. In doing this experiment, I aligned the most with the *Guided Search Theory*—an observer looks for a target among several distracting items. In that, I knew exactly what I was looking for, so when I across an upright, blue 'T', I was able to tune it out because I knew any object of that color would be a red herring. This allowed me to focus specifically on the red 'T's, but this still did not allow me to instantly identify the upright 'T's among the others.

Let's examine what would happen if we looked at this theory from the lens of *Signal Similarity Theory*—the task's difficulty is dependent on the similarity of stimulus to distractor. If this theory was utilized during the task of search, then I would not be able to tune out the blue upright 'T's because they would be the most familiar to me. Thus, I would take more time, and be more inaccurate.

I think that this experiment correctly isolated the focus of attention that it was after. That being, I was tasked to *search* through a variety of objects that had combined traits in order to find the target. I believe this is the most pertinent type of experiment for this task.

Divided Attention

This study was designed to test *divided attention*—the distribution of attention among multiple tasks (see the last paragraph for discussion). Researchers had a rectangle diagram that was halved along the equator, exposing two sections that were labeled either shape or filling. In these sections, there are different rules, as shown below:

1. **Shape:** A shape would flash on the screen, and I was to press either `b` for a diamond shape, or `n` for a square.

2. **Filling:** In this section, two sets of dots flashed on the screen. I was to use the same characters again, but this time, the letters `b` corresponded to 2 dots inside of a shape, and the letter `n` corresponded to 3 dots.

This is a divided attention study because the dots were inside the shape on the top section. Similarly, the shapes containing the dots on the bottom section were the same diamond or square that I had to identify on the top screen. This mix-matching of signals made it difficult to differentiate what character to press. For instance, because the same characters were utilized for both the top and bottom sections, the assignment of the rules for each section 'bled' into the other section.

This 'bleeding' of rules can be attributed to Treisman's *Feature Integration Theory*—objects are analyzed into their features in the preattentive stage, and the features are later combined with the aid of attention. That is, when I first saw the object that flashed on my

screen (preattentive), I mentally noted how many dots were in the shape, and what the shape was. Depending on where the shape spawned in the diagram, I was primed to favor the numerical value or the shape's orientation. In a way, I was preemptively dialing down one aspect of the figure that was dependent on its placement in either half. Interestingly, after a few milliseconds, I would combine the two features into one, and that would complicate things; I learned the longer that I analyze the shape, the slower (and more inaccurate) I became.

This is in stark contrast to a theory posed by Broadbent's *Filter Model of Attention*—selective attention is the ability to focus on one stimuli and ignore other stimuli simultaneously. According to his early selection model, if I were to focus on either the top or bottom of the rectangle and associate the corresponding rule with either section, I would get the correct answer every time by completely tuning out the dots or the shape. This was not the case.

The researchers wanted to specifically study divided attention in this study, and I do not think this is the best method to use for this topic. In fact, I think this study is more akin to the *Conjunction Search* that was defined above. I make this claim because conjunction searches are designed to study *binding*—the process by which features such as color, form, motion, and location are combined to create our perception of a coherent object—and that was the primary distractor of the study. One could argue that juggling the rules in your head is divided attention, but I would disagree: the 'juggling' of rules is more appropriately attributed to binding. Instead of 'juggling the rules' a more fitting term would be 'entanglement of rules' (specifically, in dealing with the de-entanglement of the rules to find the correct one). Perhaps a study more akin to David Strayer and William Johnston (2001) would be a more viable research direction for distracted attention.