Missouri State Human Subjects Protection Application

**Title:** Longitudinal Ratings of Associative Judgments

**Description:** A judgments of associative memory (JAM) task asks participants to guess at how often people would list two words together. For example, when given LOST about 75 people out of a 100 will list FOUND. In the JAM task, participants are shown two words together, such as CAT-MOUSE, to rate at the number of people out of 100 who would say MOUSE to CAT. In these tasks, judgments are very poor. They are biased upwards (too high), and participants cannot discern between low and high frequency pairs (Maki, 2007). Previous work in our lab has shown that these judgments cannot be made more accurate with different instructions or asking participants to guess at the number of words that are even related to one word (for example, COMPUTER has over 30 words related to it).

The databases that contain the word information were created with a free association task (Nelson, McEvoy, & Schreiber, 2004). The free association task is a list of words, and participants are asked to write down the first word that “comes to mind when given the word listed”. The current study will give participants the free association task several times to create individual participant word norms. At the end of the experiment, participants will be ask to list the number of times *they* put two concepts together, as opposed to the original instructions of how many times did *other people* put these two words together. The experiment will determine if judgments of association can be improved by using personal memories instead of guesses at other’s memories.

**Protocol:**

**Participants:** Participants will be recruited from the Psychology Undergraduate Pool by use of the SONA system. Generally, these participants will be undergraduates and over 18 years of age. They will sign up for the project online, take their credit hours online, and be given credit according to the number of sections they finish for the study. Each section should take 10-15 minutes, and one credit is given for every 30 minutes of participation according to Psychology Department standards.

***Materials.*** Stimuli will be selected from the free association word norms by Nelson et al. (2004). The database contains different word-pair combinations, along with the probabilities of those pairings. For example, with the pair STEAK-SIRLOIN, STEAK is the cue word that is paired with the target word, SIRLOIN. If a 100 people were asked to name the first word they associated with STEAK, about 5 people would list the word SIRLOIN. This number is the probability of the combination STEAK-SIRLOIN. Each cue word (the first word) has several different target words (STEAK-COW, STEAK-SAUCE). Cue words will be selected that have varying number of target combinations, but specifically words with more cue-target combinations (i.e. 10 or more). 30 cue words will be selected to use in the experiment.

**Procedure*.*** This study will be longitudinal in nature, so several different data collection points will be required. Research assistants will be used to help coordinate participants who are in different stages of the experiment. The entire experiment will be presented online, so that participants may complete the study from any computer with internet access.

***Procedure – Experimental Group.*** This group of participants will be given the chance to compare their own, actual paring probabilities instead of others’ likely judgments. This intervention will proceed as follows. In the norming stage of the experiment, participants will be given instructions on a free association task. The instructions describe free association as the “first word that pops into your mind when you hear a CUE word”. For example, many people talk about owning a CAT and a DOG, but we may also mention that it’s raining CATS and DOGS outside. These examples help portray free association as language *use* and not just language *meaning*, so that participants do not simply write only FUR, TAILS, WHISKERS when asked about CATS. After these instructions, participants will be given up to 30 cue words with four blanks each. Some pilot testing will be run to determine the number of cue words for each presentation, to keep response times at about 10-15 minutes for each survey. For each cue word, they will write the first four target words that come to mind, which is intended to create some variation in target words during the first stage. After they complete all the cue words, their answers are stored.

After a minimum of two days, participants will be allowed to take the survey again. The cue words on the survey will be randomly generated for each survey, so that cue words appear in a random order and are not tested twice until each cue word has been presented at least once. Participants will be sent email reminders when they are allowed to complete the next section of the study. Depending on when the participants sign up for the study, they will answer each cue word at the minimum of five times with a maximum of ten times. The second part of the experiment will be given when the participant has answered each cue word at least ten times or at the end of the semester for participants with at least five trials for each cue word. These trials will be averaged and probabilities will be created for each cue-target pairing, similar to the Nelson et al. database. For example, over the course of ten trials, participants may have listed many words for the cue COMPUTER, such as MOUSE, SCREEN, GAME, PROGRAM, KEYBOARD, DATA, FAST, etc. Each of those pairings will have a probability of occurring for that participant (i.e. they may have listed SCREEN on all 10 surveys / 10 possible = 100%). From these pairings, 30 cue-target combinations will be selected, one for each original cue word. A mix of low, medium and high probabilities will be selected for the final survey. Participants will be asked to estimate the probability of their combination of each cue-target pair. For instance, a participant might see the following: “When asked about COMPUTER, you listed the word PROGRAM. What percent of the time did you put COMPUTER and PROGRAM together?” After they finish the final survey, course credit will be finalized and a debriefing of the project will be shown.

***Procedure – Control Group.*** Results froma separate control group will be compared against the experimental participant judgment scores. Since each experimental participant’s final word pairs will be different, a group of cue-target pairings will be selected from the Nelson et al. database to match the experimental groups. The same 30 cues will be used, and target words will be mixed so that there is an equal number of low, medium, and high pairings. The control group will be given the same instructions about a free association task, along with examples. Next, the rating task will be explained as follows: “How many people out of a 100 would give the TARGET (second) word when asked the CUE (first) word?” Participants will estimate the probability of word pair occurrence for the next 30 words after some practice trials.

**Study Completion:** When the study is completed, the packets are entered into a spreadsheet for further analysis. The information collected in this experiment will be used to understand memory judgments and bias. This study will be combined with some previous research on associative judgments, which will be sent for publication in a cognitive psychology journal.

**Benefits:** There are no direct benefits to participants in this study. However, the general knowledge can be applied to judgments of learning. When studying, students often believe they have enough memory of the material to do well on an exam. As previous research has shown, these judgments are biased toward a better understanding of the material (which is not always the case). This research looks at more personal memory to see if that bias can be reduced to aid in judgments.

**Risks:** There are minimal risks involved in this study, as it is similar to taking a classroom exam.

**Informed consent**: Attached. Participants will be asked to provide consent at the beginning of the study. No penalty is given for withdrawing from the study.

I hereby agree to conduct this study in accordance with the procedures set forth in my project description, to uphold the ethical guidelines as set forth in the Code of Federal Regulations 45 CFR 46, 45 CFR 160 and 164, and the Missouri State University HIPAA Policy, and to report to the IRB any outcomes or reactions to the experiment which were not anticipated in the risks description which might influence the IRBs decision to sustain approval of the project.

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Department Head

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Other Investigators

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Other Investigators

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Principal Investigator (Faculty)

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Other Investigators

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Other Investigators