MSU TEXAS

OFFICE OF SPONSORED PROGRAMS & RESEARCH

FACULTY RESEARCH GRANT APPLICATION

This application must be saved as a PDF document and uploaded to the web form linked on the Fall 2023 intramural grants web page.

I. PROJECT SUMMARY

PROJECT TITLE:

Exploring the Effects of List-Wise Relatedness on Judgment of Learning Reactivity

INVESTIGATOR INFORMATION

Add additional investigators' information below the table.

Name	College and Department	Faculty Rank
Primary Investigator: Nicholas Maxwell	**College:** Prothro-Yeager College of Humanities and Social Sciences **Department:** Psychology	**Rank:** Assistant Professor
Co-investigator: Click or tap here to enter text.	**College:** Click or tap here to enter text. **Department:** Click or tap here to enter text.	**Rank:** Click or tap here to enter text.

If applicable, add additional investigators' information here (Name, College/Department, and Rank)

SELECT THE RELEVANT FUNDING OPPORTUNITY (SELECT ONLY ONE):

Exploratory Research Pilot

ABSTRACT (LIMIT 150 WORDS):

Making Judgments of learning (JOLs) often improves memory for cue-target word pairs. However, this effect is modified by relatedness, as JOLs generally improve memory related but not unrelated items. Thus, perceived item relations likely determine whether memory improvements occur. Because previous studies have only used cue-target word pairs, it is unclear whether these reported memory benefits extend to other types of related study materials. The proposed study tests whether JOLs benefit memory for single-item words lists. JOL and no-JOL groups will study related and unrelated word lists (Experiments 1A/1B) or related words converging upon a similar, non-presented lure (i.e., *bed*, *pillow*, and *dream* are related to *sleep*; Experiments 2A/2B). Afterwards, their memory will be tested. If JOLs improve memory by strengthening concept relations, participants making JOLs should show improved memory on related but not unrelated lists. Separately, false memory for lures should similarly be higher for JOL versus no-JOL participants.

ASSURANCE AND SIGNATURES:
By affixing either a <u>typed or scanned signature</u> below, the applicants(s) agree(s) that, if funded, funds will be used to accomplish the aims of the project in accordance with MSU/State of Texas policies. Additionally, the researchers(s) will present their findings at the Celebration of Scholarship.

_____
PI Signature: Date:

_____
Co-PI Signature(s):   Date:

_____
Co-PI Signature(s):   Date:

_____
PI's Department Chair Signature: Date:

_____
PI's Dean Signature: Date:

PROJECT NARRATIVE

The project narrative is limited to 10 pages. Page numbers are included at the top right hand corner of each page. Please ensure all text that you enter uses the "normal" style on the styles toolbar of this document (Calibri 11 pt font, single spacing). Enter all responses into the text boxes on the form.

II. PURPOSE AND OBJECTIVES OF THE PROJECT (LIMIT 1 PAGE)

This section should include a concise statement of the general purpose and major aims/objectives of the proposed project (the research question/focus, hypothesis, problem or work to be investigated, or aesthetic direction/technique).

This project tests the importance of item relations as a contributing factor to judgment of learning (JOL) reactivity by investigating whether the memory benefits of JOLs that are observed when participants study related cue-target word pairs extends to related word lists.

III. SIGNIFICANCE/IMPACT

Describe the importance and potential impact of your project below. All three sections must be addressed.

A. HOW DOES THIS PROJECT BENEFIT MSU AND/OR SUPPORT MSU'S MISSION?

One goal of this study is to provide more research opportunities within the Department of Psychology. I am currently in my second year as an assistant professor and am looking to get undergraduate and graduate students more involved in research. This project will allow me to continue to recruit undergraduate students to assist me with data processing and also inspire follow-up research, which could potentially be used to fulfill thesis requirements for students in our Master's program or used as the basis for EURECA projects.

B. HOW DOES THIS PROJECT SUPPORT THE RESEARCH TRAJECTORY OF THE PI(S)?

As noted above, my primary goal for this project is to continue growing the Psychology Department's research footprint. Specifically, I plan to use this project to continue a line of research which began with my dissertation. Following the conclusion of this project, I am planning several follow-up studies which will aim to assess the effects of JOL reactivity on more educationally relevant study materials. This will allow me to develop a set of experiments which can be directly used as a vehicle to include students in the research process and potentially apply for external funding opportunities.

C. WHAT IS THE SIGNIFICANCE OF THIS PROJECT WITHIN THE FIELD OF STUDY?

This project aims to clarify factors that affect when Judgments of Learning (JOLs) improve memory. As noted in the literature review, previous research on JOL reactivity has mainly investigated these effects using cue-target word pairs of varying relatedness (e.g., related pairs like cat-dog vs. unrelated pairs like cat-muffin). A common theme is that making JOLs at encoding improves memory for related but not unrelated pairs. However, because these studies have primarily relied on word-pairs, it is unclear whether this effect is unique to related word pairs or if extends to other types of related study materials. The present study tests this by assessing whether JOLs are reactive on related and unrelated single word lists (Experiments 1A/1B) and Deese/Rodiger-McDermott lists (DRM), which consist of a series of related words that converge upon a related but not-presented critical lure (i.e., participants might study the words *bed*, *dream*, *pillow*, and *blanket*, which are all related to the non-presented word *sleep*. At test, participants often falsely report studying the word sleep, even though it was never

presented during the study phase). If making JOLs for DRM lists inflates false memory of lure items, this would provide strong evidence that JOLs improve memory by strengthening inter-item relations.

Implications: By including related, unrelated, and DRM lists, the present study will provide a more complete picture of the effects of item relatedness on JOL reactivity. Furthermore, the present study will be the first to test whether JOLs are additionally reactive on false memories for DRM lures.

IV. LITERATURE REVIEW

Enter the literature review (for research projects) or description of artistic/creative precedence (for artistic/creative endeavors) below. This should be in narrative form—it is not simply a list of references.

When learning new information, it is helpful to assess whether the knowledge one is acquiring is being sufficiently encoded so that it can be retrieved later. Metamemory, or the processes by which individuals regulate their learning, is crucial for learning, as these processes help individuals determine whether items need additional study or if they have been sufficiently learned (see Nelson & Narens, 1990). To investigate questions surrounding metamemory, researchers commonly use Judgment of Learning (JOL) tasks, where participants study a set of items while predicting their likelihood of correctly remembering them on a later test (see Rhodes, 2016). Thus, JOLs provide a simple measure for assessing how various experimental manipulations affect the study process.

Because JOL tasks are easy to implement, they have a rich history of being used in cognitive psychology. For much of this history, JOLs were assumed to be neutral measures having little or no effect on later remembering. Thus, making JOLs was not thought to influence memory. However, a growing body of research has begun to show that JOLs are *reactive* on learning, such that participants who make JOLs while completing a study task often show different patterns of test performance compared to participants who silently read items instead of making judgments (see Double et al., 2018). Thus, JOLs modify memory for studied items, likely by calling attention to aspects of stimuli that might otherwise be ignored (see Ericcson & Simon, 1993).

Studies investigating the mechanisms behind JOL reactivity have commonly used cue-target word pairs. These studies have revealed a consistent pattern of reactivity: When pairs are semantically related (e.g., *mouse – cheese*), making JOLs improves memory for the target item (Janes et al., 2018; Halamish & Undorf, 2023; Maxwell & Huff, 2022; Soderstrom et al., 2015). However, this memorial benefit does not extend to unrelated pairs (e.g., *mouse – cup*), particularly when memory is assessed via cued-recall testing. To explain why relatedness moderates JOL reactivity patterns, Soderstrom et al. proposed that two conditions must be met for reactivity to occur on cue-target pairs. First, studied items must contain intrinsic cues which participants use to inform their JOLs (see Koriat, 1997). Second, participants must be tested using a method that is sensitive to any cues that are strengthened due to making JOLs. Based on this account, when participants are tested via cued-recall, a memory benefit should occur on related pairs, as cued-recall testing is highly sensitive to pair relatedness. For unrelated pairs, however, JOLs do not produce a memorial benefit, as intrinsic cue-target relations are not available for this pair type.

While the cue-strengthening account does not explicitly specify the particular cues which JOLs strengthen, it is likely that making JOLs primarily strengthens pre-existing cue-target relations, given that pair relatedness is a highly salient cue for later remembering (Mueller et al., 2013). Given this possibility, recent studies have explored the degree to which relatedness specifically contributes to reactivity. For example, Maxwell and Huff (2022) compared recall for participants making JOLs to three additional encoding groups: A no-JOL control group, a group of participants completing a shallow vowel-counting task instead of providing JOLs, and, importantly, a group of participants who engaged in a deep relational encoding task. Compared to both the no-JOL and shallow encoding groups, JOL participants

showed positive reactivity for all related pair types. Critically, participants in the relational encoding group also demonstrated this pattern, even though they were not required to provide JOLs at encoding. Thus, Maxwell and Huff concluded that providing JOLs at encoding specifically encouraged participants to process cue-target relations, rather than other cues which could similarly improve memory.

As previously noted, most work investigating JOL reactivity has tested for potential memory changes using various types of cue-target word pairs. This is likely because factors influencing JOLs are often studied within the context of related versus unrelated cue-target pairs, rather than via list-wise manipulations of relatedness (see Chang & Brainerd, in press). However, fully understanding why relatedness improves memory for judged items requires the use of multiple types of stimuli beyond cue-target word pairs. As such, the proposed study will assess how list-relatedness (i.e., a series of single words centering around a specific theme) relates to JOL reactivity. Like cue-target relatedness, list relatedness has similarly been shown to affect the magnitude of JOL (Chang & Brainerd, in press; Matvey et al., 2006). However, participants likely use different cues when processing related lists versus related word pairs. Based on Koriat's (1997) cue-utilization account, making JOLs for cue-target pairs promotes the use of intrinsic cues (i.e., inherent item properties) which participants use to inform the magnitude of their JOLs. Pre-existing cue-target relations reflect a primary example of intrinsic cues, given that the relation between items is inherent to the pair and easily processed at encoding. However, by nature, single-item lists display study items to participants one item at a time. Thus, any relatedness cues would reflect extrinsic cues, given that participants must assess how the item relates back to previously presented items within the list. Thus, extrinsic cues reflect the specific characteristics in which encoding occurs, rather than inherent properties of the stimuli.

Regarding JOL reactivity, few studies have directly assessed the effects of making JOLs on memory for single-item lists. As a result, current theories of JOL reactivity primarily focus on explaining the role intrinsic cues as an underlying factor for reactivity to occur on cue-target pairs (e.g., Soderstrom et al.'s, 2015 cue-strengthening account). Thus, it remains unclear whether the relatedness effects driving JOL reactivity with cue-target pairs would similarly affect categorized word lists. In a notable exception, however, Senkova and Otani (2021) assessed the effect of list relatedness on JOL reactivity by testing for reactivity on categorized and uncategorized word lists for participants making JOLs, pleasantness ratings, or a control task in which participants simply assigned a random number to each item (Experiment 1) and participants making JOLs, completing an imagery task, or the control task (Experiment 2). Across experiments, participants making JOLs had greater free-recall relative to participants in the control group. Importantly, recall benefits were greater for categorized lists, suggesting that the presence of list-wise relatedness facilitated reactivity. Additionally, both deep encoding comparison groups also improved free-recall relative to participants in the no-JOL control group. Because both pleasantness ratings and imagery tasks are classic item-specific tasks based on the item-specific/relational framework (Einstein & Hunt, 1980; Hunt & Einstein, 1981), Senkova and Otani argued that positive JOL reactivity reported on categorized wordlists reflected an item-specific process rather than a relational encoding process. Considered alongside findings investigating the effects of relatedness on reactivity with cue-target pairs (e.g., Halamish & Undorf, 2023; Maxwell & Huff, 2022), it is likely that JOL reactivity reflects different underlying processes based on the type of stimuli that participants study.

Although it is evident that making JOLs benefits recall of related versus unrelated cue-target pairs, less is known about the effects of making these judgments on categorized and uncategorized lists. As such, the proposed study will first attempt to replicate findings from Senkova and Otani (2021) demonstrating that categorized lists show a greater memorial benefit versus uncategorized lists using both free-recall (Experiment 1A) and recognition testing (Experiment 1B). Next, Experiments 2A and 2B will use the

Deese-Roediger-McDermott false memory paradigm (Deese; 1959; Roediger & McDermott, 1995), which will allow for an assessment item-specific and relational processes on JOL reactivity while also investigating whether JOLs could additionally be reactive on false memory for related but non-presented lures. Overall, if JOLs strengthen pre-existing item relations, participants making JOLs at encoding should show improved memory for categorized but not uncategorized word lists. Separately, false memory for lures should similarly be inflated for JOLs participants. As such, this pattern of results would provide strong evidence that memory benefits from making JOLs primarily reflect a relational process.

V. RESEARCH OR CREATIVE DESIGN AND METHODS

Describe the research or creative design and methods of your project below. For research projects, include a methods/design section with details specific to your discipline (materials, texts, equipment, protocols, etc). For creative projects, include a description of the source materials, processes, and/or techniques. For all projects, describe the role each person (PI, co-PIs, student workers) will have in the project.

Overview:

This study is planned as a four-experiment package. First, Experiments 1A and 1B will investigate whether JOL reactivity effects observed on related cue-target pairs extend to related word lists. Next, Experiments 2A and 2B will test whether DRM lists, which present participants with a series of related words which converge on a strongly related but not presented critical lure, also demonstrate memory changes as a function of JOLs. Importantly, the use of DRM lists in Experiments 2A/2B allows for a replication/extension of any potential memory benefits observed in Experiments 1A/1B while also assessing whether JOLs are potentially reactive on false memories, which, to date, has not been explored. Finally, because JOL reactivity effects may differ based on how memory is assessed, Experiments 1A and 2A will assess learning via open-ended, free-recall testing, while Experiments 1B and 2B will gauge memory via recognition testing.

Participants:

For each experiment, 120 participants will be recruited. Participants will be recruited from Prolific (www.prolific.co) and will be compensated at a rate of $4.00/half hour. Participants will be randomly assigned to one of three encoding groups: An item-level JOL group (n = 40) in which participants will provide JOLs after studying each word, A global-level JOL group in which participants will make one JOL per list, following the completion of each 12-item study list (n = 40), and a no-JOL group in which participants will silently read each item (n = 40). This sample size was based on an a priori power analysis conducted using *G*POWER 3.1* software (Faul, Erdfelder, Buchner, & Lang, 2009), which suggested that a sample of 120 participants per experiment would be sufficient to detect small main effects and interactions (d = .28). Additionally, the 40 participants per group requirement was modeled after previous sample sizes used for online JOL reactivity studies (e.g., Maxwell & Huff, 2022; 2023). All participants will be required to be native English speakers who have obtained at least a high-school level degree or equivalent.

Materials:

   Experiments 1A/1B: The stimuli in Experiments 1A and 1B will be eight 12-item word lists. These lists will consist of four categorized lists taken from the Van Overschelde et al.'s (2004) Category Norms and four uncategorized lists in which all words are unrelated. In addition to relatedness, lists will be

checked for other factors which could potentially influence later memory, including word length, frequency, and concreteness.

Participants will study two of each list type (48 items total), which will be presented in a random order. Counterbalanced versions of the experiment will be developed which alternate which set of two lists that participants study.

Next, two memory tests will be developed. For Experiment 1A, a series of free-recall tests will be developed based on each list. Specifically, participants will be instructed to recall the previously presented words. For Experiment 1B, participants will complete a 96-item "OLD-NEW" recognition test. This test will include all 48 previously studied items as well as the 48 items from the non-studied lists, which will serve as distractors. Thus, the only difference between Experiments 1A and 1B is the method of testing.

Experiments 2A/2B: In Experiments 2A and 2B, the eight word lists used in Experiments 1A/1B will be replaced with twenty 12-item DRM lists taken from Roediger et al. (2001). Like the previous experiments, counterbalanced versions of the experiment will be made, with participants studying a total of 10 lists. Additionally, participants will be tested via free-recall (Experiment 2A) or recognition testing (Experiment 2B). Free-recall testing will utilize the same instructions as previously reported. The recognition test will consist of 80 items: 30 studied items (taken from positions 2, 5, and 8 in each list), 30 non-studied distractors (taken from positions 2, 5, and 8 in each non-studied list), and 10 critical lures corresponding to each of the 10 studied lists, and 10 critical lures corresponding to the 10 non-studied lists. All other aspects of Experiments 2A/2B will be identical to Experiments 1A/1B.

Procedure:

Experiment 1A: Following informed consent, participants will be instructed to study a series of words and will be informed that their memory for each word will later be tested. Participants in the JOL groups will then receive further instructions to judge their ability to remember the items they are studying for a later test. Specifically, participants in the item-JOL group will be instructed to make JOLs following the presentation of each word. JOLs will be framed as a probability estimate of correctly remembering each word on a later test (0 = will NOT remember; 100 = WILL remember). Separately, participants in the global JOL group will be asked to provide a single JOL following the presentation of each word list. Thus, the two JOL groups will differ in both the number of JOLs they provide per list (one per item vs. one per list) and the timing of the JOL. Participants in the no-JOL group will be informed of the memory test but will not be tasked with making memory judgments. For all groups, study will be self-paced, with participants pressing the ENTER key to advance to the next word.

After receiving their respective encoding instructions, participants will begin the first study list. Immediately following this list, participants will complete a 30 second filler task in which they will be asked to list as many words beginning with a random letter as they can within the time limit (e.g., list all words that begin with the letter "M"). Immediately afterwards, participants will complete a free-recall test, in which they will be asked to type as many words from memory as they remember from the previously studied list. Following completion of the first study-test cycle, participants will advance to the next study phase. After completing the final cycle, participants will be debriefed. The total experiment is expected to take 30 minutes to complete.

Experiment 1B: Experiment 1B will utilize the same procedure described above, with the exception that the free-recall tests will be replaced with a single "OLD-NEW" recognition test, which will occur following the final study list. Items on the recognition test will be randomly presented, and participants will not be timed.

Experiment 2A: Experiment 2A will follow the same general procedure outlined in Experiment 1A, except that the four-word lists will be replaced with 10 DRM lists. All other aspects of the procedure, including the use free-recall testing, will be identical to Experiment 1A.

Experiment 2B: Experiment 2B will follow the same general procedure outlined in Experiment 1A, except that the four-word lists will be replaced with 10 DRM lists. All other aspects of the procedure, including the use of recognition testing, will be identical to Experiment 1B.

VI. PROTECTION OF HUMAN SUBJECTS/ANIMALS (IF APPLICABLE)

Enter any information about protection of human subjects or animals below, including a plan and timeline for obtaining IRB or IACUC approval.

An IRB application has been submitted to the Institutional Review Board at MSU Texas. IRB approval is currently pending.

VII. BUDGET JUSTIFICATION

*In the budget justification narrative below, clearly explain why/how each expense is necessary to achieve the project aims and how the amount was calculated. Ensure that the amounts in the budget justification match the totals on the budget spreadsheet. In addition, list the date by which each expenditure should occur (no later than Aug. 31, 2024). If a graduate student grant is attached to this proposal, do **not** include graduate student grant expenses in the budget/justification.*

A. STUDENT WAGES

N/A

B. SUPPLIES
This includes all materials, consumables, software, etc. with a per-item purchase price of less than $500

N/A

C. TRAVEL TO CONDUCT RESEARCH
Use current state of Texas / GSA travel rates. Travel to conduct research is an allowable expense, but funds may not be used for costs associated with travel to attend or present at professional meetings or conferences. Include the purpose of the trip, destination (if known—may be TBD), duration, number of travelers, and estimated transportation costs, lodging costs, and meals and incidentals.

N/A

D. OTHER
Include all expenses that do not fit within other categories (e.g. contracted services, data purchases, etc.)

I plan to recruit participants via Prolific. Prolific requires that researchers pay participants at a rate of at least $8/hour. Additionally, prolific charges a 25% fee on top of participant pay (https://researcher-help.prolific.com/hc/en-gb/articles/360009223533-What-is-your-pricing-). Since this study is being planned to take 30 minutes to complete, I should expect to spend $5.00 per participant ($4/participant in base pay plus $1.00 in Prolific fees). For each experiment, I plan to recruit 120 participants (40

participants per experimental condition). Since this study is being planned as a four-experiment package, this means I am expecting to recruit a total of 480 participants at a rate of $5.00/participant ($4.00 in pay + $1.00 in fees). Thus, I'm anticipating that it will cost $2400 to collect the necessary data via Prolific.

E. EQUIPMENT
Include all items with a per-unit purchase price of greater than $500 and a useful life of longer than one year. Include copies of any quotes with your application.

N/A

VII. TIMELINE FOR THE PROJECT

Please provide a timeline for the project, by month, with completion of the project no later than Aug. 31, 2024.

October 2023: Finalize materials, program experiments, and submit IRB application.

November 2023: Begin data collection pending receipt of funding and IRB approval. Submit abstract to SWPA as a research proposal poster.

December 2023: Complete data collection on Experiments 1A and 1B

January 2024: Analyze data from Experiments 1A and 1B.

February 2024: Recruit additional participants if needed for Experiments 1A/1B; Begin work on poster

March 2024: Begin data collection on Experiments 2A/2B; Present preliminary findings from Experiments 1A/1B at SWPA

April 2024: Analyze all remaining data; recruit additional participants if needed. Present findings at Celebration of Scholarship

May 2024: Begin drafting manuscript with target submission deadline of August 1st, 2024.

IX. SPECIFIC PLANS FOR DISSEMINATION

Please describe specific plans for dissemination of the findings of the project, including Celebration of Scholarship.

Findings from this project would be shared in three ways. First, I plan on presenting preliminary findings from this project as a poster at the annual meeting of the Southwestern Psychological Association (SWPA), which will be held in March 2024 in San Antonio, TX (the dates for SWPA 2024 have not officially been announced yet, but the conference is traditionally held each year during the last week of March). Second, I plan on presenting this project as either a poster or a talk at Celebration of Scholarship. Finally, I plan on using Summer 2024 as an opportunity to write this project up for publication in a peer reviewed journal. Target journals might include *Memory & Cognition* (https://www.springer.com/journal/13421) or *Metacognition and Learning* (https://www.springer.com/journal/11409).

X. OTHER CURRENT/PROSPECTIVE SOURCES OF INTERNAL OR EXTERNAL FUNDING

A. OTHER CURRENT OR PENDING SOURCES OF INTERNAL AND/OR EXTERNAL FUNDING

If other internal or external funding has been requested or procured (e.g. department funds, other grants), please describe the relationship of that funding to this proposal

N/A

B. PLANS FOR PURSUING AND SECURING EXTERNAL FUNDING

Describe how you plan to use your intramural-funded research or creative project to pursue and secure external funding. You are encouraged to identify specific grants or other funding sources for which you intend to apply upon completion of the funded project. Contact OSPR if you would like assistance in identifying potential funding matches.

As noted in the project overview, one goal for this project is to move the investigation of JOL reactivity beyond cue-target word pairs and towards more educationally relevant stimuli. Following completion of this study, I plan to pursue external funding by applying for either an NSF grant related to applied cognition or target a grant with the James S. McDonnell Foundation (JSMF). In 2022, the JSMF put out a call for project proposals related to applied cognition, including the use of more educationally relevant material in cognitive and neuropsychology. If such an opportunity arises within the next 2-3 years, I plan on submitting a proposal based on findings from this project.

Finally, since I plan to use the project to inspire student research, I plan on having students who work on related projects apply for Psi Chi research grants. Psi Chi offers several opportunities for undergraduate and graduate students, with awards ranging from $400 to $3500. Importantly, depending on the award, students would be able to use this funding to cover conference travel and/or as research funds to collect data via Prolific or purchase any necessary equipment.

XI. CONTINUATION PROJECT INFORMATION

Is this project a continuation of a project initiated with a previous intramural award? If so, please describe the rationale and benefits of requesting an additional intramural award in this funding cycle. Also describe how this project is different from the previously funded project.

N/A XII. PRIOR INTRAMURAL GRANTS

*If the **PI and/or or co-PIs** have been awarded any other intramural grants in the previous 5 years, please fill out the table below. List ALL PIs and co-PIs who were named on the grant. **Note:** Faculty who are serving as PI/co-PI on a current, active intramural grant are **ineligible** to receive any additional intramural grant funding until the final report is submitted and accepted by OSPR. Add additional rows to the table if necessary. **These awards should also be listed on the relevant PI/co-PI's biographical sketch.***

PI and co-PI Name(s)	Award Cycle/Year (e.g. Fall 2019)	Title of Project
Nicholas Maxwell	Fall 2022	Investigating the Effects of Mindfulness on Source-Monitoring Accuracy

APPENDICES:

All proposals must include appendices 1-3. If necessary, include quotes for equipment and IRB/IACUC approvals as an additional appendix after Appendix 2.

- ***Appendix 1: References Cited:*** *List references cited in a discipline-appropriate style.*

- ***Appendix 2: Biographical Sketches:*** *On the following pages, please fill out biosketches for the PI and all co-PIs. If you need additional biosketches, please copy/paste the blank form onto a new page.*

- ***Appendix 3: Budget Spreadsheet:*** *This is an Excel document that will be uploaded as a separate file. The template can be downloaded from the Fall 2023 Intramural Grants web page.*

Appendices do not count against your 10-page limit.

APPENDIX 1. REFERENCES

List references cited in the proposal using a discipline-appropriate citation style.

Chang, M. & Brainerd, C. J. (in press). The font size effect depends on inter-item relation. *Memory & Cognition*, 1-12.

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APPENDIX 2. BIOGRAPHICAL SKETCHES

Each biosketch is limited to 2 pages. Please add and delete rows as needed. Each investigator should complete both pages of the biosketch. If you need additional biosketches, copy/paste the blank form to a new page.

PRINCIPAL INVESTIGATOR (PI) BIOSKETCH:

Name: Nicholas Maxwell		
Rank: Assistant Professor	College: Prothro-Yeager	Dept: Psychology

EDUCATION/TRAINING

Institution/Location	Degree	Year(s)	Field of Study
University of Southern Mississippi	PhD	2022	Cognitive Psychology
Missouri State University	MS	2018	Experimental Psychology
Mississippi State University	BA	2015	Psychology

ACADEMIC AND PROFESSIONAL EXPERIENCE

Academic Year(s)	Rank and Tenure Status
2022-Present	Assistant Professor (Tenure-Track)

COURSES TAUGHT AT MSU TEXAS IN THE PREVIOUS TWO YEARS

Semester and Year	Course Title
Fall 23	PSYC 4503 Psychological Tests & Evaluations
Fall 22; Spring 23; Fall 23	PSYC 3323 Developmental Psychology (6 sections (2 per semester))
Fall 22; Fall 23	PSYC 3303 Writing in Psychology (2 sections (1 per semester))
Summer 23	PSYC 4163 Cognition
Spring 23	PSYC 4703 Research Methods
Spring 23	PSYC 3503 Social Psychology
Fall 2022	PSCY 1103 General Psychology I

RELEVANT PUBLICATIONS/PRESENTATIONS

List publications and presentations relevant to the proposed project below.

Relevant Publications:

Maxwell, N. P., Cates, E. E., & Huff, M. J. (In Press). Item-specific and relational encoding are effective at reducing the illusion of competence. *Psychological Research*, X – XX. Available at: https://osf.io/x9n4f/

Maxwell, N. P. & Huff, M. J. (2023). Is discriminability a requirement for reactivity? Comparing the effects of mixed vs. pure list presentations on judgment of learning reactivity. *Memory & Cognition, 51*(5), 1198-1213. Available at: https://osf.io/3fztn/

Maxwell, N. P. & Huff, M. J. (2022). Reactivity from judgments of learning is not only due to memory forecasting: Evidence from associative memory and frequency judgments. *Metacognition and Learning, 17*(2), 589-625. Available at: https://osf.io/8yvn3/

Maxwell, N. P., Perry, T., & Huff, M. J. (2022). Perceptually fluent features of study words do not inflate judgements of learning: Evidence from font size, highlights, and Sans Forgetica font type. *Metacognition and Learning, 17*(2), 293-319. Available at: https://osf.io/3xwdr/

Maxwell, N. P. & Huff, M. J. (2021). The deceptive nature of associative word pairs: Effects of associative direction on judgments of learning. *Psychological Research, 85*, 1757-1775. Available at: https://osf.io/hvdma/.

Maxwell, N. P. & Buchanan, E. M. (2020). Investigating the interaction of direct and indirect relation on memory judgments and retrieval. *Cognitive Processing, 21*(1), 41-53. Available at https://osf.io/fcesn/

Relevant Presentations:

Maxwell, N. P & Huff, M. J. *Investigating the Effects of Mediated Association on JOL Reactivity.* Abstract accepted at the 64th annual meeting of the Psychonomic Society, San Francisco, CA (Nov. 2023).

Maxwell, N. P., Cates, E. E., & Huff, M. J. *Item-Specific and Relational Encoding are Effective at Reducing the Illusion of Competence.* Talk presented at the University of Southern Mississippi's annual Susan A. Siltanen Graduate Student Research Symposium, Hattiesburg, MS (April 2022).

Maxwell, N. P. & Huff, M. J. *The Effects of Associative Direction on Judgment of Learning Reactivity*. Poster presented at the 61st annual meeting of the Psychonomic Society, Virtual Conference (Nov. 2020).

Maxwell, N. P. & Huff, M. J. *Relations are not Always Beneficial: The Effect of Associative Direction on Judgments of Learning*. Poster presented at the 60th annual meeting of the Psychonomic Society, Montreal, QC, CA (Nov. 2019).

OTHER RELEVANT ACTIVITIES

*In this section, list up to **five** items that demonstrate the broader impact of your professional and scholarly activities as they relate to this project. Examples may include, among others: innovations in teaching and training, mentorship activities, awards and honors, etc.*

Awards: In Fall 2022, I received a Research and Faculty Development Grant worth approximately $1500 which was used to present my research findings at international and regional conferences.

Mentorship: During the 2022-2023 academic year, I mentored three graduated students who presented their work at the annual meeting of the Southwestern Psychological Association and Celebration of Scholarship. This would not have been possible without the intramural grant I received last year.

Other: In 2021, I developed an *R* package for scoring lexical output from memory studies (package available at: https://cran.r-project.org/web/packages/lrd/index.html; publication available at: https://link.springer.com/article/10.3758/s13428-021-01718-y). This package is open-source and has been made freely available to other memory researchers to aid with data scoring/coding. This program will be used to score recall data generated from the proposed study.

CURRENT AND PREVIOUS MSU INTRAMURAL GRANT FUNDING

You must list all MSU intramural grants on which you have served as PI or co-PI since Fall 2018. Add additional lines if needed.

#	Award Cycle	Title	PI and co-PI name(s)
1	Fall 2022	Investigating the Effects of Mindfulness on Source-Monitoring Accuracy	Nicholas Maxwell
2			
3			
4			

How were the results of these prior intramural awards disseminated or made public? Include the type of dissemination (e.g. manuscript, book chapter, exhibition, presentation).

#	
1	Presentations (Southwestern Psychological Association, March 2023; Celebration of Scholarship Spring 2023); Manuscript is currently in preparation
2	
3	
4	

CURRENT AND PREVIOUS EXTERNAL GRANT FUNDING

If applicable, list all external grants or research contracts on which you have served as PI or co-PI.

Title or brief description	PI and co-PI names	Sponsor	Start/End Dates

Co-PI 1 should complete both pages of this biosketch. Please feel free to add or delete rows as needed.

CO-PI 1 BIOSKETCH

Name:		
Rank:	College:	Dept:

EDUCATION/TRAINING

Institution/Location	Degree	Year(s)	Field of Study

ACADEMIC AND PROFESSIONAL EXPERIENCE

Academic Year(s)	Rank and Tenure Status

COURSES TAUGHT AT MSU TEXAS IN THE PREVIOUS TWO YEARS

Semester and Year	Course Title

RELEVANT PUBLICATIONS/PRESENTATIONS

List publications and presentations relevant to the proposed project below.

OTHER RELEVANT ACTIVITIES

*In this section, list up to **five** items that demonstrate the broader impact of your professional and scholarly activities as they relate to this project. Examples may include, among others: innovations in teaching and training, mentorship activities, awards and honors, etc.*

CURRENT AND PREVIOUS MSU INTRAMURAL GRANT FUNDING

You must list all MSU intramural grants on which you have served as PI or co-PI since Fall 2018. Add additional lines if needed.

#	Award Cycle	Title	PI and co-PI name(s)
1			
2			
3			
4			
How were the results of these prior intramural awards disseminated or made public? Include the type of dissemination (e.g. manuscript, book chapter, exhibition, presentation).			
1			
2			
3			
4			

CURRENT AND PREVIOUS EXTERNAL GRANT FUNDING

If applicable, list all external grants or research contracts on which you have served as PI or co-PI.

Title or brief description	PI and co-PI names	Sponsor	Start/End Dates

Co-PI 2 should complete both pages of this biosketch. Please feel free to add or delete rows as needed.

CO-PI 2 BIOSKETCH

| Name: |
| Rank: | College: | Dept: |

EDUCATION/TRAINING

Institution/Location	Degree	Year(s)	Field of Study

ACADEMIC AND PROFESSIONAL EXPERIENCE

Academic Year(s)	Rank and Tenure Status

COURSES TAUGHT AT MSU TEXAS IN THE PREVIOUS TWO YEARS

Semester and Year	Course Title

RELEVANT PUBLICATIONS/PRESENTATIONS

List publications and presentations relevant to the proposed project below.

OTHER RELEVANT ACTIVITIES

*In this section, list up to **five** items that demonstrate the broader impact of your professional and scholarly activities as they relate to this project. Examples may include, among others: innovations in teaching and training, mentorship activities, awards and honors, etc.*

CURRENT AND PREVIOUS MSU INTRAMURAL GRANT FUNDING

You must list all MSU intramural grants on which you have served as PI or co-PI since Fall 2018. Add additional lines if needed.

#	Award Cycle	Title	PI and co-PI name(s)
1			
2			
3			
4			
How were the results of these prior intramural awards disseminated or made public? Include the type of dissemination (e.g. manuscript, book chapter, exhibition, presentation).			
1			
2			
3			
4			

CURRENT AND PREVIOUS EXTERNAL GRANT FUNDING

If applicable, list all external grants or research contracts on which you have served as PI or co-PI.

Title or brief description	PI and co-PI names	Sponsor	Start/End Dates

Co-PI 3 should complete both pages of this biosketch. Please feel free to add or delete rows as needed.

CO-PI 3 BIOSKETCH

Name:		
Rank:	College:	Dept:

EDUCATION/TRAINING

Institution/Location	Degree	Year(s)	Field of Study

ACADEMIC AND PROFESSIONAL EXPERIENCE

Academic Year(s)	Rank and Tenure Status

COURSES TAUGHT AT MSU TEXAS IN THE PREVIOUS TWO YEARS

Semester and Year	Course Title

RELEVANT PUBLICATIONS/PRESENTATIONS

List publications and presentations relevant to the proposed project below.

OTHER RELEVANT ACTIVITIES

*In this section, list up to **five** items that demonstrate the broader impact of your professional and scholarly activities as they relate to this project. Examples may include, among others: innovations in teaching and training, mentorship activities, awards and honors, etc.*

CURRENT AND PREVIOUS MSU INTRAMURAL GRANT FUNDING

You must list all MSU intramural grants on which you have served as PI or co-PI since Fall 2018. Add additional lines if needed.

#	Award Cycle	Title	PI and co-PI name(s)
1			
2			
3			
4			

How were the results of these prior intramural awards disseminated or made public? Include the type of dissemination (e.g. manuscript, book chapter, exhibition, presentation).			
1			
2			
3			
4			

CURRENT AND PREVIOUS EXTERNAL GRANT FUNDING

If applicable, list all external grants or research contracts on which you have served as PI or co-PI.

Title or brief description	PI and co-PI names	Sponsor	Start/End Dates