

NEURAL EVIDENCE FOR A CONTEXT-CHANGE ACCOUNT OF LIST-METHOD DIRECTED FORGETTING



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INTRODUCTION & METHODS

- THE MENTAL CONTEXT IN WHICH WE EXPERIENCE AN EVENT PLAYS A FUNDAMENTAL ROLE IN HOW WE ORGANIZE OUR MEMORIES AND, IN TURN, HOW WE RETRIEVE THOSE MEMORIES LATER.
- PROCESSES THAT ALTER OUR REPRESENTATIONS OF MENTAL CONTEXT CAN ENHANCE OR DIMINISH OUR CAPACITY TO RETRIEVE PARTICULAR MEMORIES.
- WE DESIGNED AN FMRI EXPERIMENT TO TEST THE HYPOTHESIS THAT PEOPLE CAN INTENTIONALLY FORGET PREVIOUSLY EXPERIENCED EVENTS BY "FLUSHING OUT" THE ASSOCIATED CONTEXTUAL INFORMATION.
- WE USED MYPA-PREDICTED SCENE ACTIVATIONS TO INFER HOW MUCH LIST A CONTEXTUAL INFORMATION WAS PRESENT IN PARTICIPANTS' THOUGHTS THROUGHOUT THE EXPERIMENT.

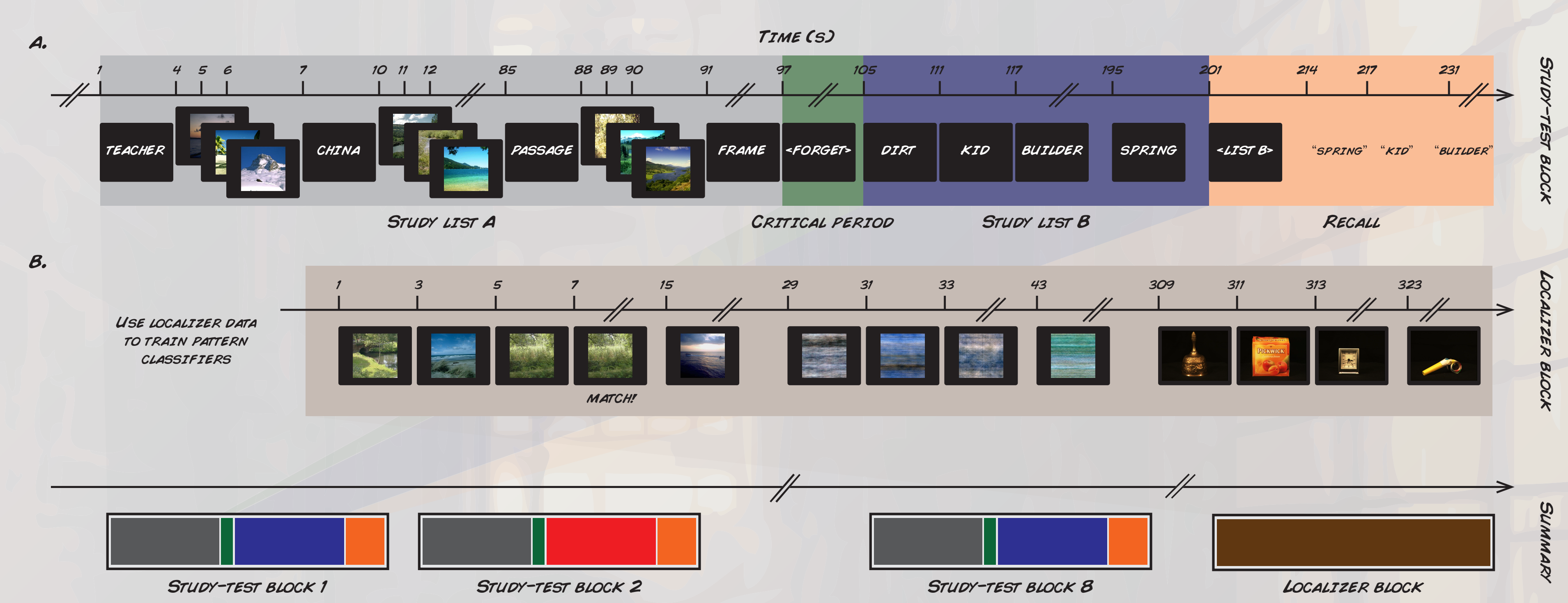


EXHIBIT 1. WE HAD PARTICIPANTS STUDY TWO LISTS OF WORDS (A AND B), MANIPULATING WHETHER THEY WERE TOLD TO FORGET THE LIST A PRIOR TO STUDYING LIST B. WE ALSO HAD PARTICIPANTS PASSIVELY VIEW IMAGES OF OUTDOOR SCENES PRESENTED BETWEEN THE LIST A WORDS; WE HOPED THESE WOULD BE INTEGRATED INTO LIST A CONTEXTUAL REPRESENTATIONS.



IN SEARCH OF HARD EVIDENCE, TEAM DF TAKES TO THE SEEDY BACK ALLEYS OF PRINCETON, NJ. A SHADOWY FIGURE, KNOWN ONLY AS THE FLUSHER APPEARS SUDDENLY, CLAIMING TO HAVE SHOCKING FIRST-HAND KNOWLEDGE OF HOW WE FORGET...

RESULTS PART 1

- PARTICIPANTS REMEMBER FEWER LIST A WORDS AND MORE LIST B WORDS FOLLOWING A FORGET (VS. REMEMBER) CUE.
- SCENE ACTIVATIONS (REFLECTING LIST A CONTEXT) DECREASE MORE FOLLOWING A FORGET (VS. REMEMBER) CUE.
- THE DECREASE IN SCENE-RELATED ACTIVITY FOLLOWING A FORGET CUE PREDICTS PARTICIPANTS' ABILITIES TO RECALL THE LIST A WORDS.

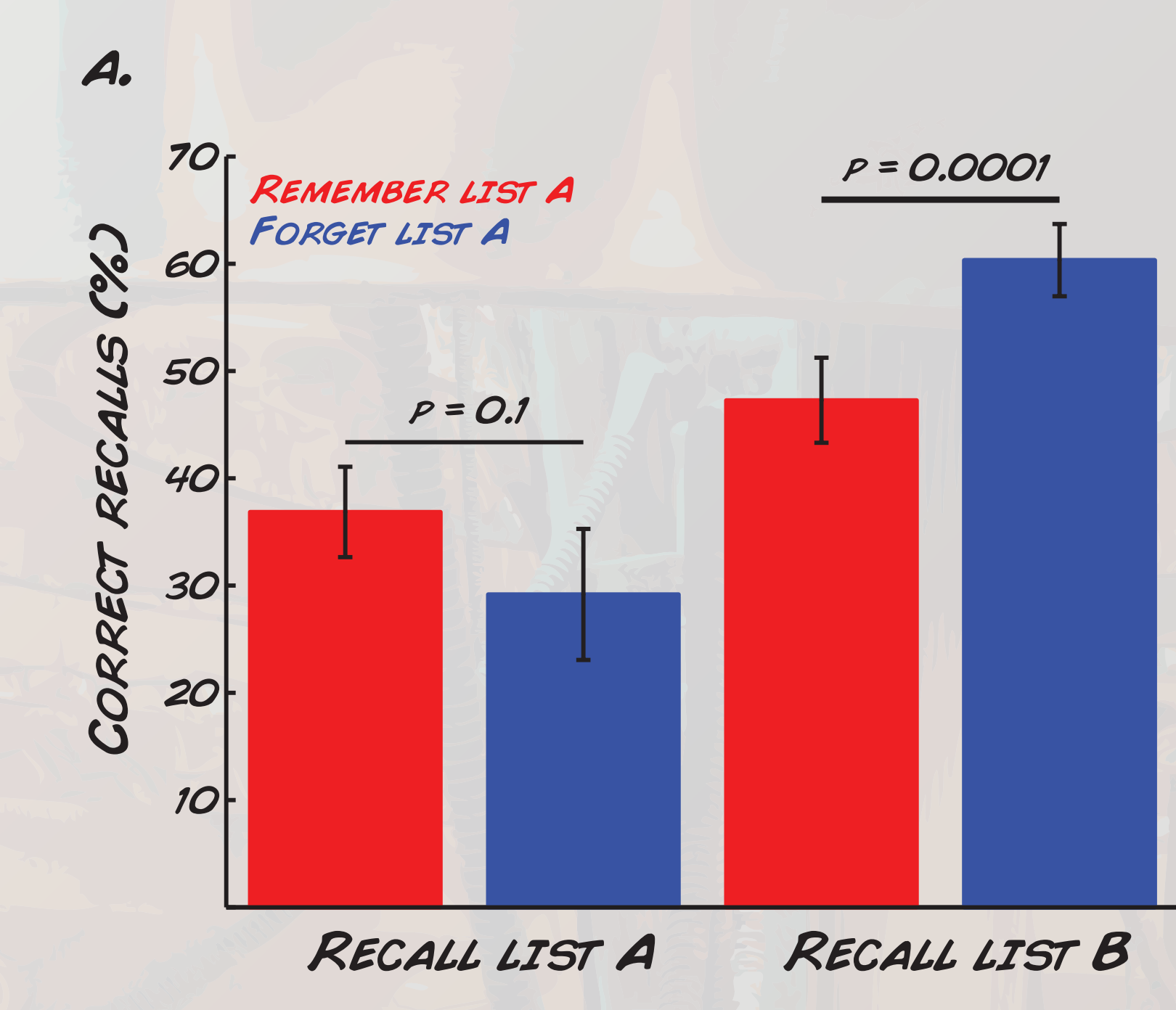
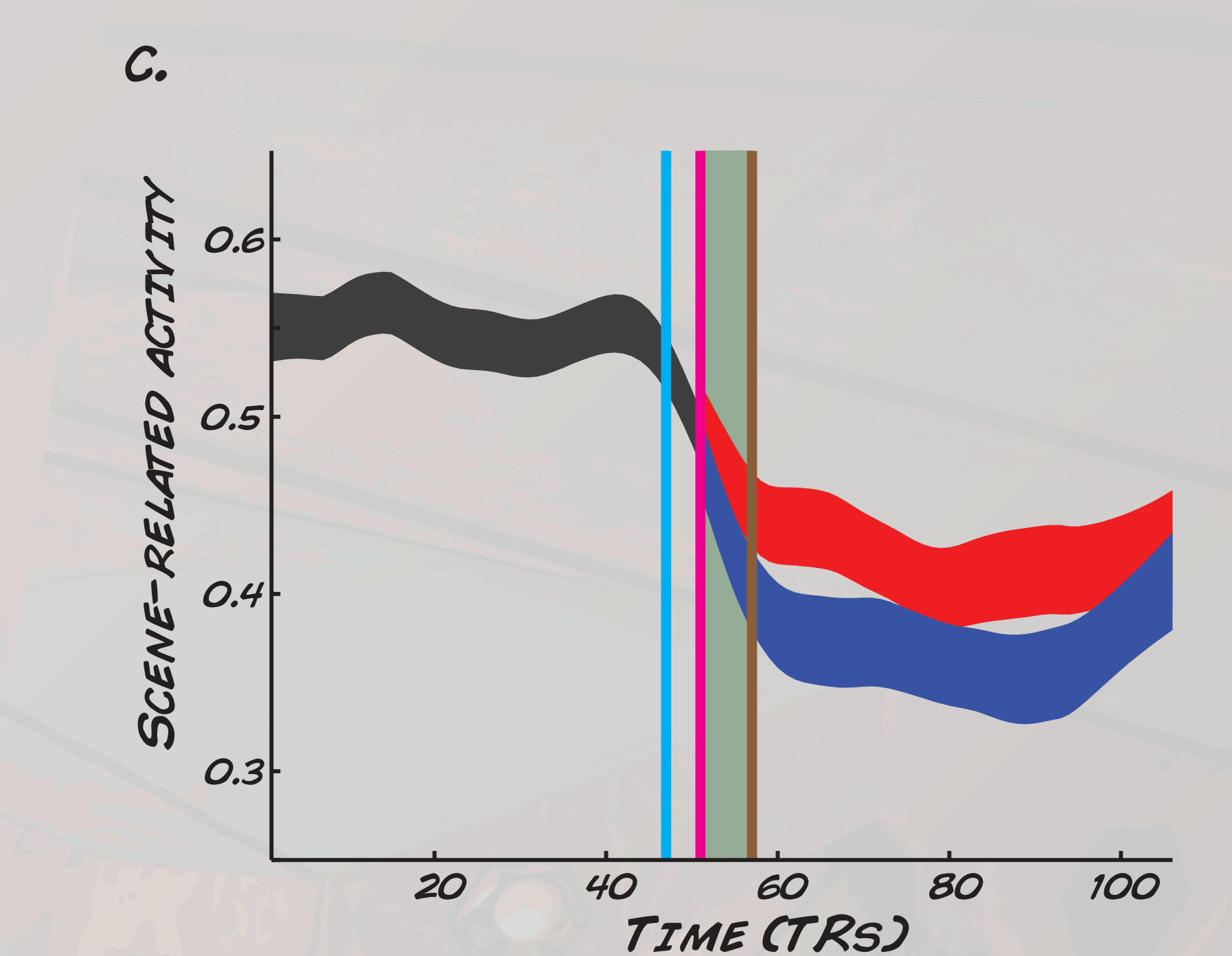
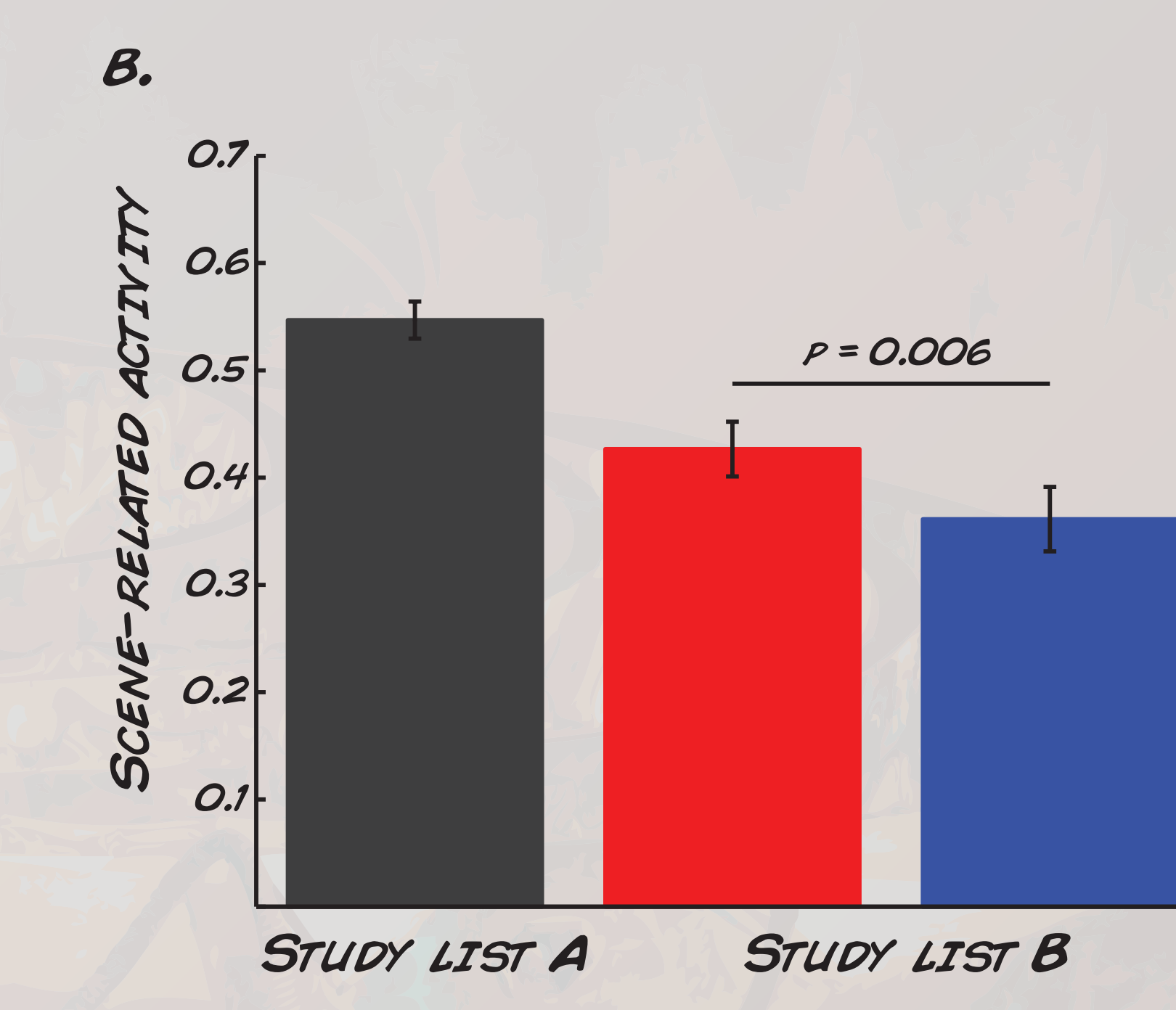


EXHIBIT 2. A. RECALL PERFORMANCE. B. SCENE-RELATED NEURAL ACTIVITY. C. NEURAL TIMECOURSE.



RESULTS PART 2

- WE USED GLMS TO IDENTIFY WHICH REGIONS CONTRIBUTED TO CONTEXTUAL FLUSHING DURING THE CRITICAL PERIOD.
- THESE REGIONS ARE SIMILAR TO THOSE INVOLVED IN FLUSHING OUT "SITUATION MODELS" WHEN WE TRANSITION FROM ONE EVENT TO ANOTHER.
- WE ALSO IDENTIFIED REGIONS THAT RESPONDED DIFFERENTLY DURING LIST B FOLLOWING FORGET VS. REMEMBER CUES.

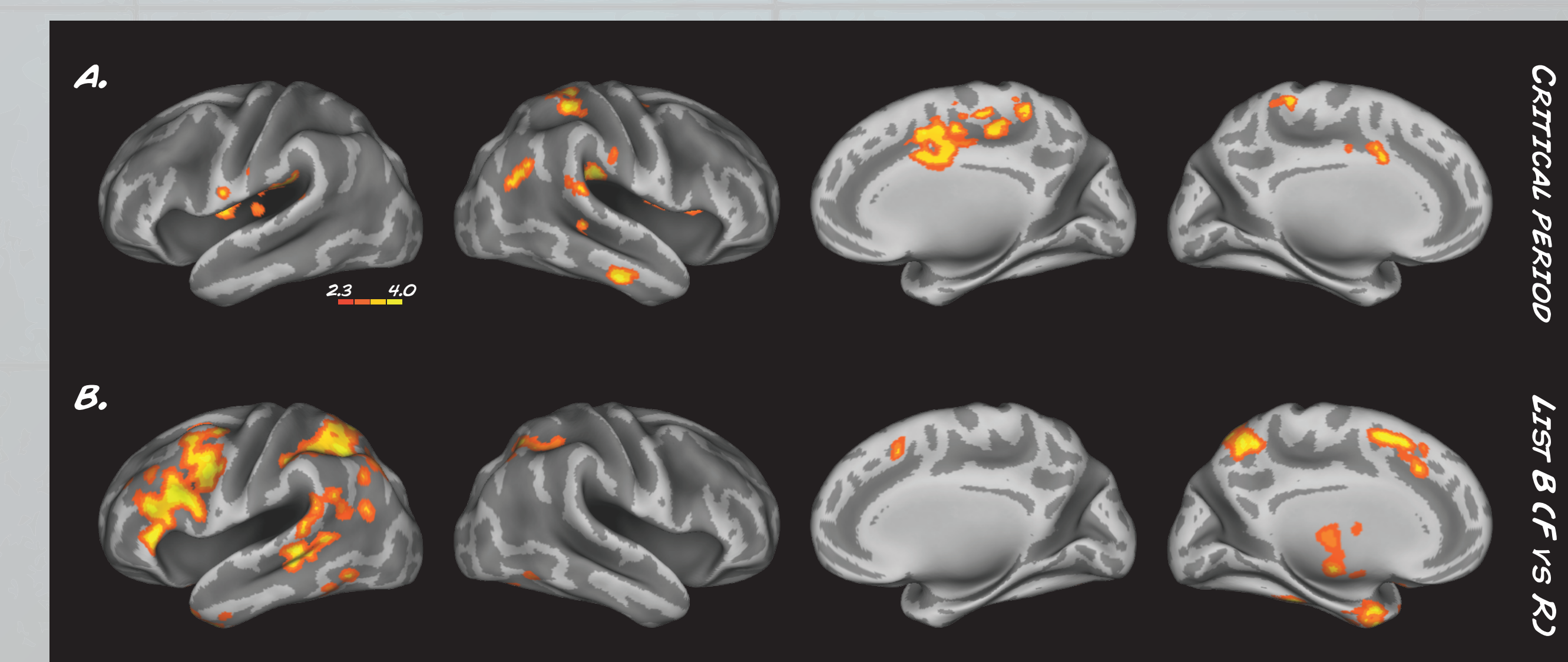
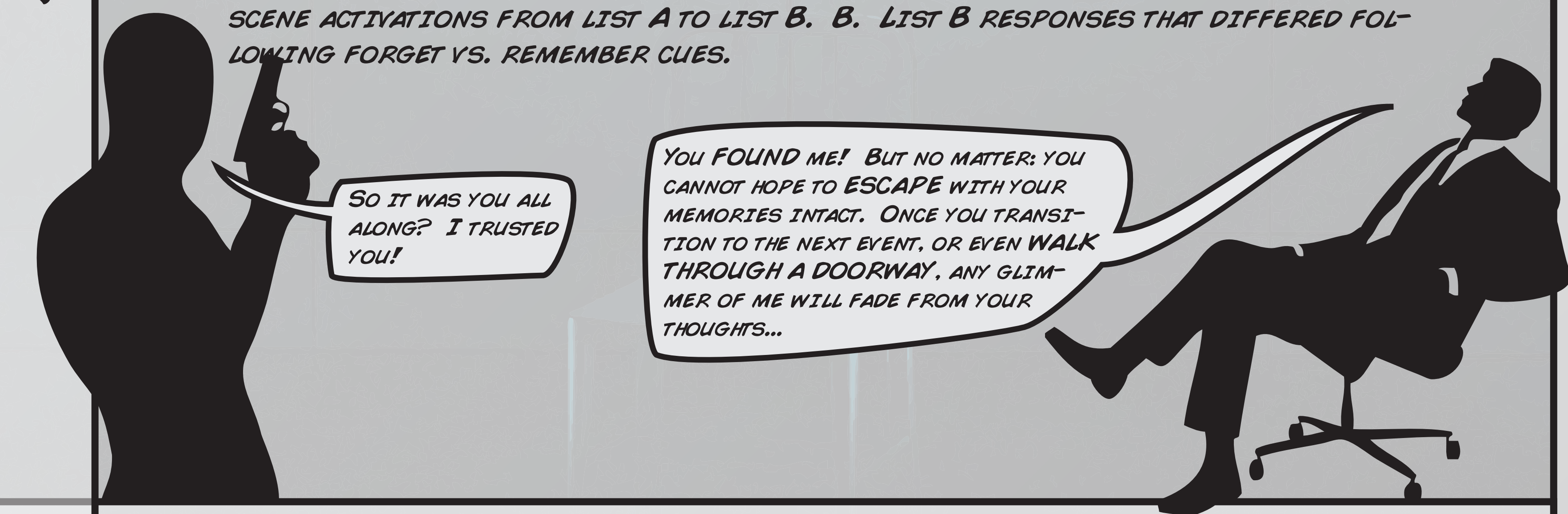


EXHIBIT 4. A. CRITICAL PERIOD RESPONSES THAT PREDICTED THE DECREASE IN SCENE ACTIVATIONS FROM LIST A TO LIST B. B. LIST B RESPONSES THAT DIFFERED FOLLOWING FORGET VS. REMEMBER CUES.



OVER MONTHS OF CAREFUL INVESTIGATION, TEAM DF BEGINS TO UNCOVER A TERRIBLE TRUTH. AT LONG LAST, THE FLUSHER'S IDENTITY IS REVEALED!

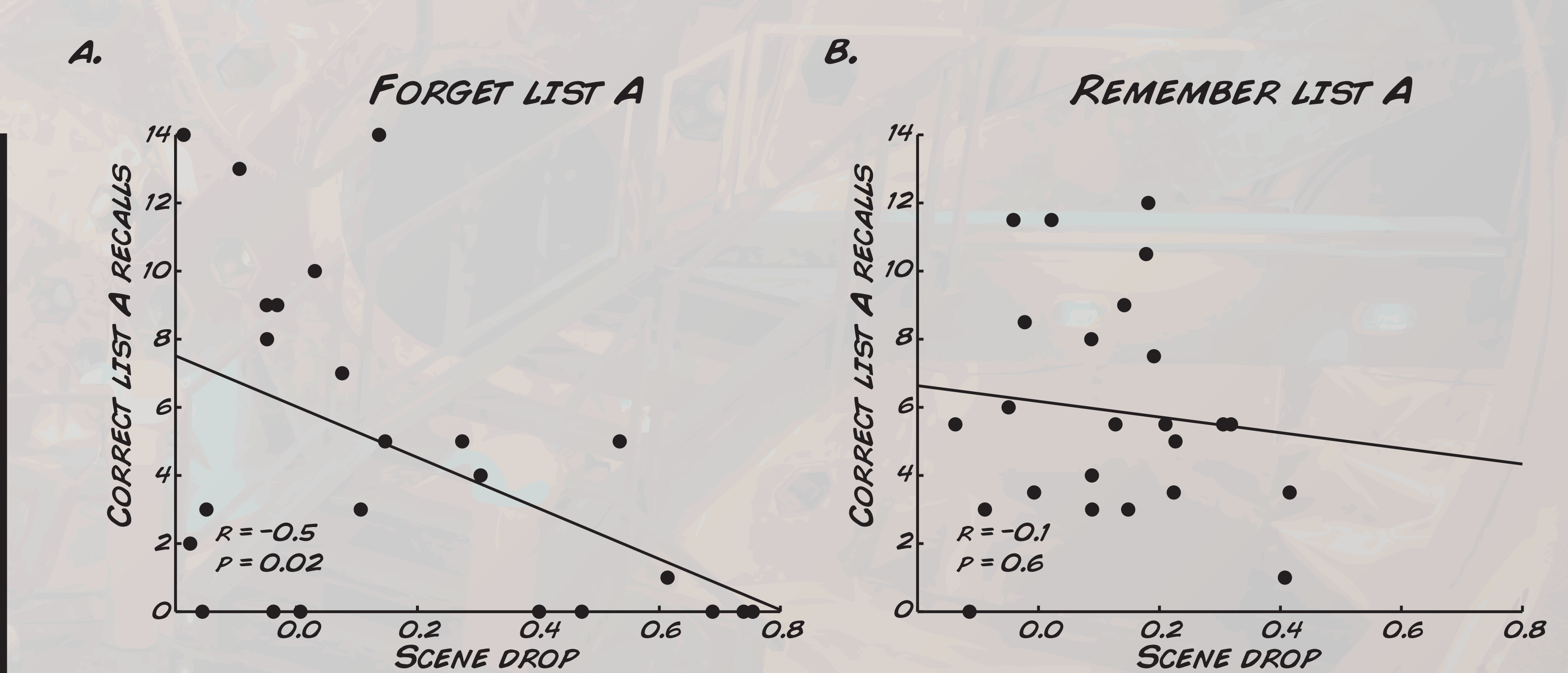


EXHIBIT 3. DECREASE IN SCENE ACTIVATIONS FROM LIST A TO LIST B VS. CORRECT LIST A RECALLS. A. AFTER A FORGET CUE. B. AFTER A REMEMBER CUE.

USING THE LATEST MIND-READING TECHNOLOGY, TEAM DF PROBES THE BRAINS OF 25 UNSUSPECTING VICTIMS. THE FLUSHER'S CLAIMS APPEAR TO CHECK OUT, BUT WHERE DOES IT ALL HAPPEN IN THE BRAIN?!?

INTERPRETATIONS & CONCLUSIONS

- OUR WORK HIGHLIGHTS THE FUNDAMENTAL ROLE THAT CONTEXTUAL INFORMATION PLAYS IN OUR ABILITY TO ORGANIZE AND RETRIEVE INFORMATION PERTAINING TO PREVIOUS EXPERIENCES.
- WE SHOW THAT ONE TOOL WE USE TO FORGET INFORMATION ABOUT OUR RECENT PAST IS TO FLUSH OUT CONTEXTUAL INFORMATION ASSOCIATED WITH THOSE EXPERIENCES.

ANOTHER CASE SOLVED. WHAT ADVENTURES LIE AHEAD FOR THESE BRAIN SLEUTHS? WHAT OTHER DEEP MYSTERIES OF THE MIND AWAIT DISCOVERY? FIND OUT MORE AT WWW.PRINCETON.EDU/~MANNING3...