

Relations are not Always Beneficial: The Effect of Associative Direction on Judgments of Learning

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Introduction

Examining the relationship between one’s predicted versus actual memory performance is the primary goal of metamemory researchers. A common method for examining this relationship is instructing participants to provide judgments of learning (JOLs) in which participants rate the probability that they will be able to later recall a target word from a studied cue-target pair (e.g., bank-interest) when only a cue word is provided at test (e.g., bank-_____).

JOL accuracy is sensitive to the strength of the association between the cue-target pairs as well as the direction of the association. Koriat and Bjork (2005) showed that when forward associative pairs are studied (e.g., red-hot), JOLs are well calibrated to later recall accuracy. However, an *Illusion of Competence* was found for backward associative pairs (e.g., hot-red) in which JOL estimates exceeded later cued recall rates, a pattern that also extends to identical item pairs (Castel, McCabe, & Roediger, 2007).

The present study builds off of these previous findings by comparing asymmetric forward and backward associates to symmetrical associates (e.g., on-off) and unrelated pairs (e.g., cat-pencil) to more closely examine the role of associative direction on JOLs and cued-recall accuracy. Additionally, we provide a novel analysis—calibration plots, which plot JOL ratings as a function of recall accuracy to determine whether the calibration between JOLs and recall depends upon the relative JOL rating that is provided. Experiment 2 introduces a 5 second response deadline which limits the amount of time subjects spend encoding item pairs. We expect this limited encoding time to result in a more pronounced overestimation effect, as less time spent at encoding should lead to greater recall inaccuracies.

Materials

Forward Pairs

Wage – Money
Chisel – Hammer
Editor – News
Way – Out
Credit – Card
Tuna – Fish
Swan – Bird
Root - Plant

Backward Pairs

Money – Wage
Hammer – Chisel
News – Editor
Out – Way
Card – Credit
Fish – Tuna
Bird – Swan
Plant - Root

Symmetrical Pairs

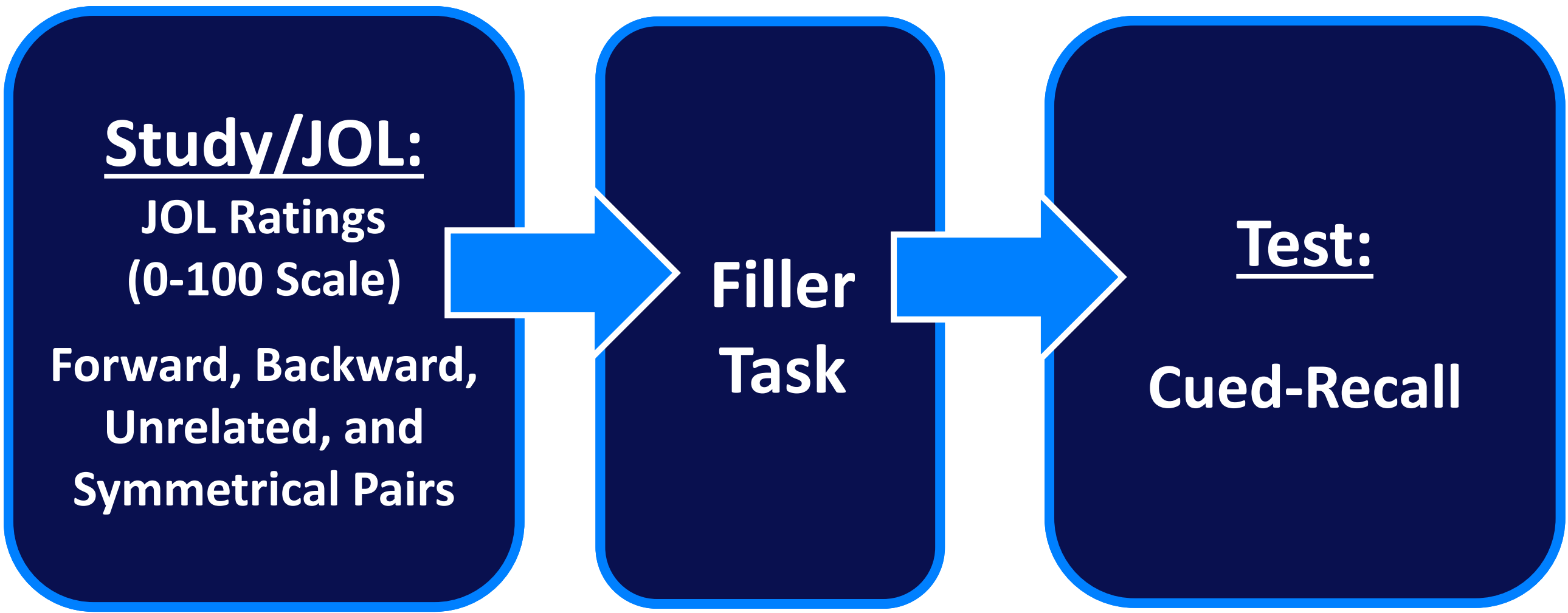
Due – Assignment
Kidney – Liver
Shoe – Foot
Honey – Bee
Circle – Round
Wine – Cheese
Bar – Grill
Begin - End

Unrelated Pairs

Park – Hungry
Lift – Woman
Soon – Belt
Discover – Floor
Artery – Bronze
Strong – Accident
Sugar – Riddle
Cash - Would

40 pairs were created for each associative direction type using the Nelson et al. (2004) free association norms. All study blocks were matched on FSG, length, concreteness, and frequency.

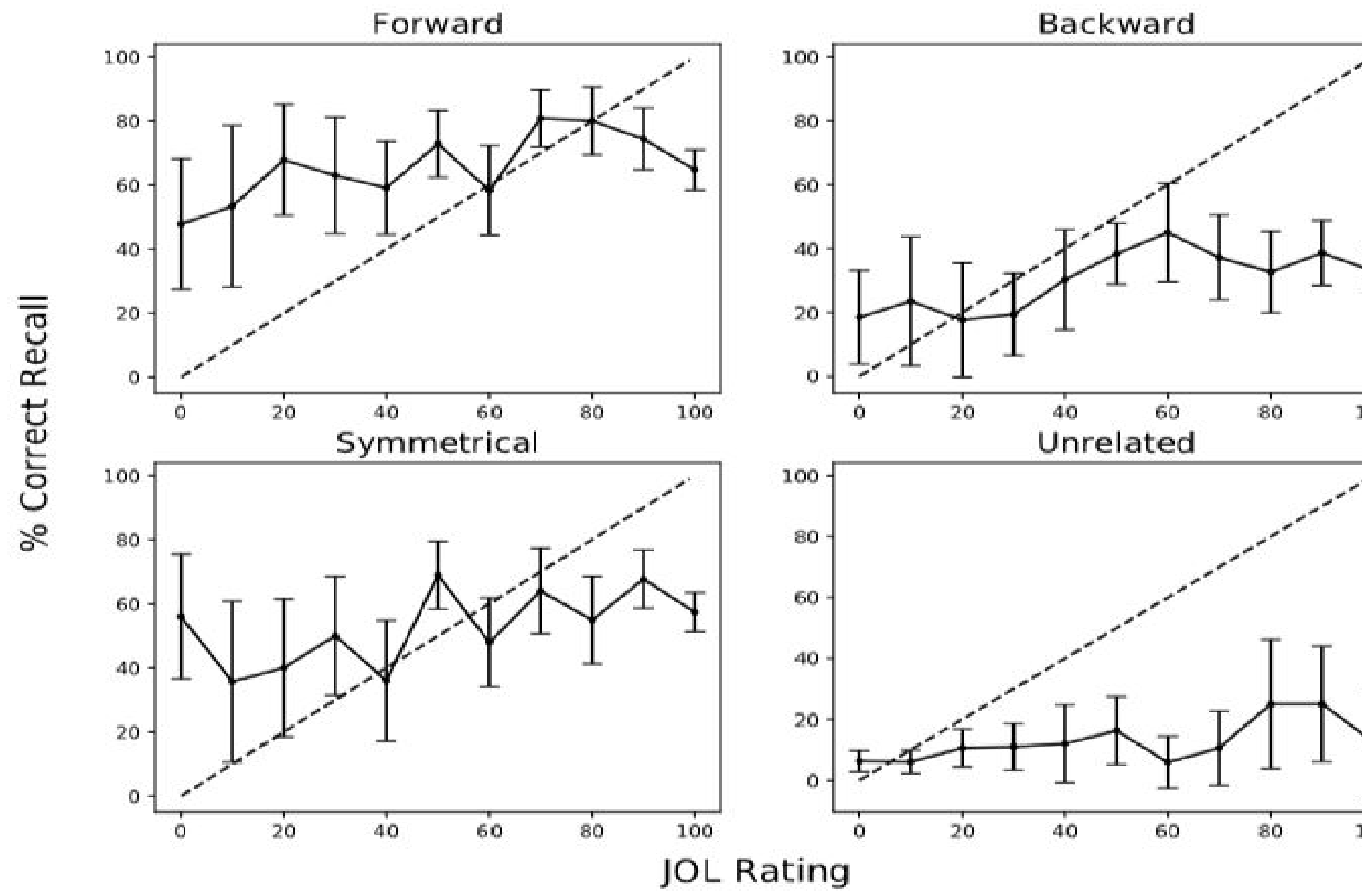
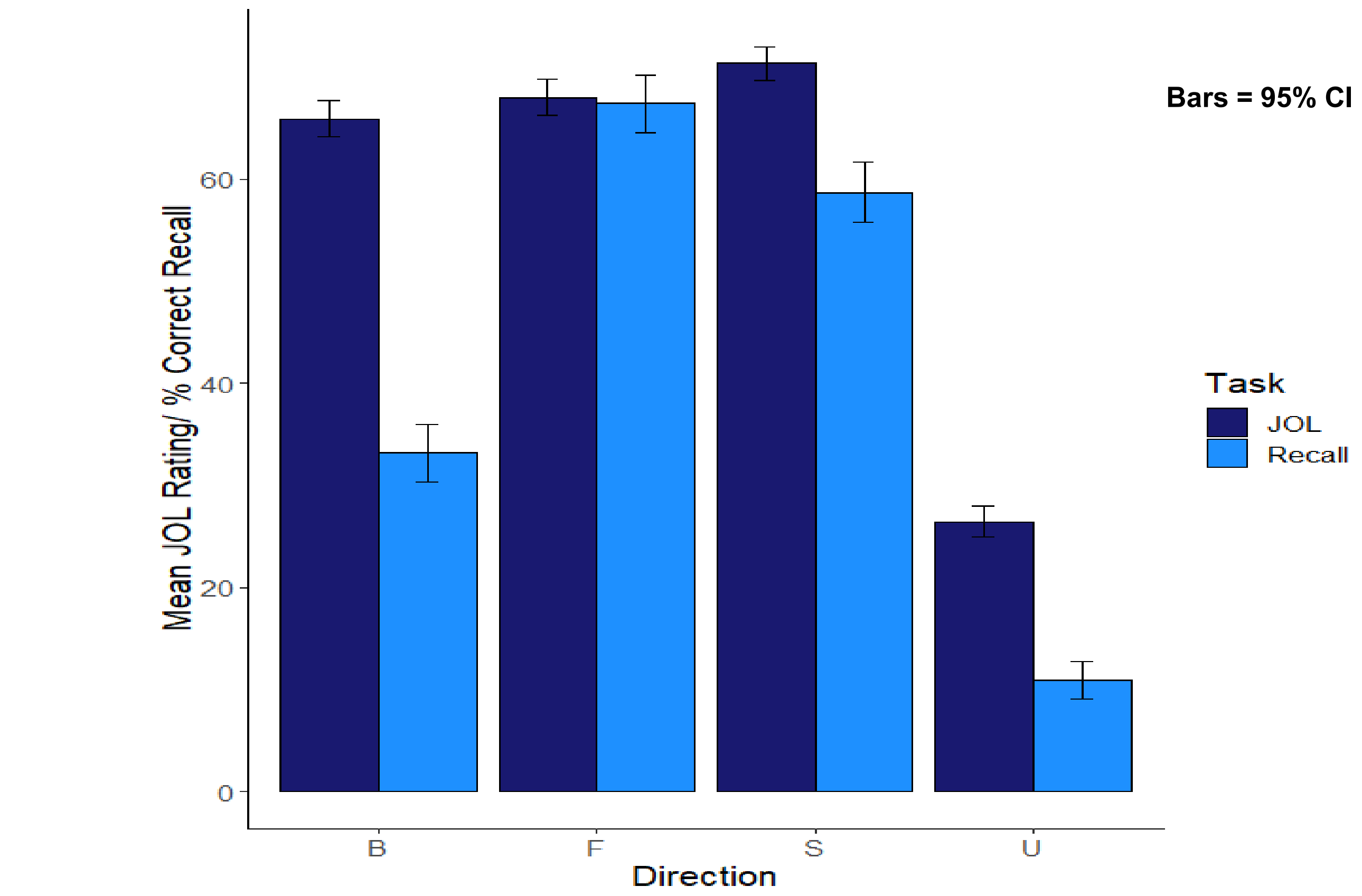
General Method



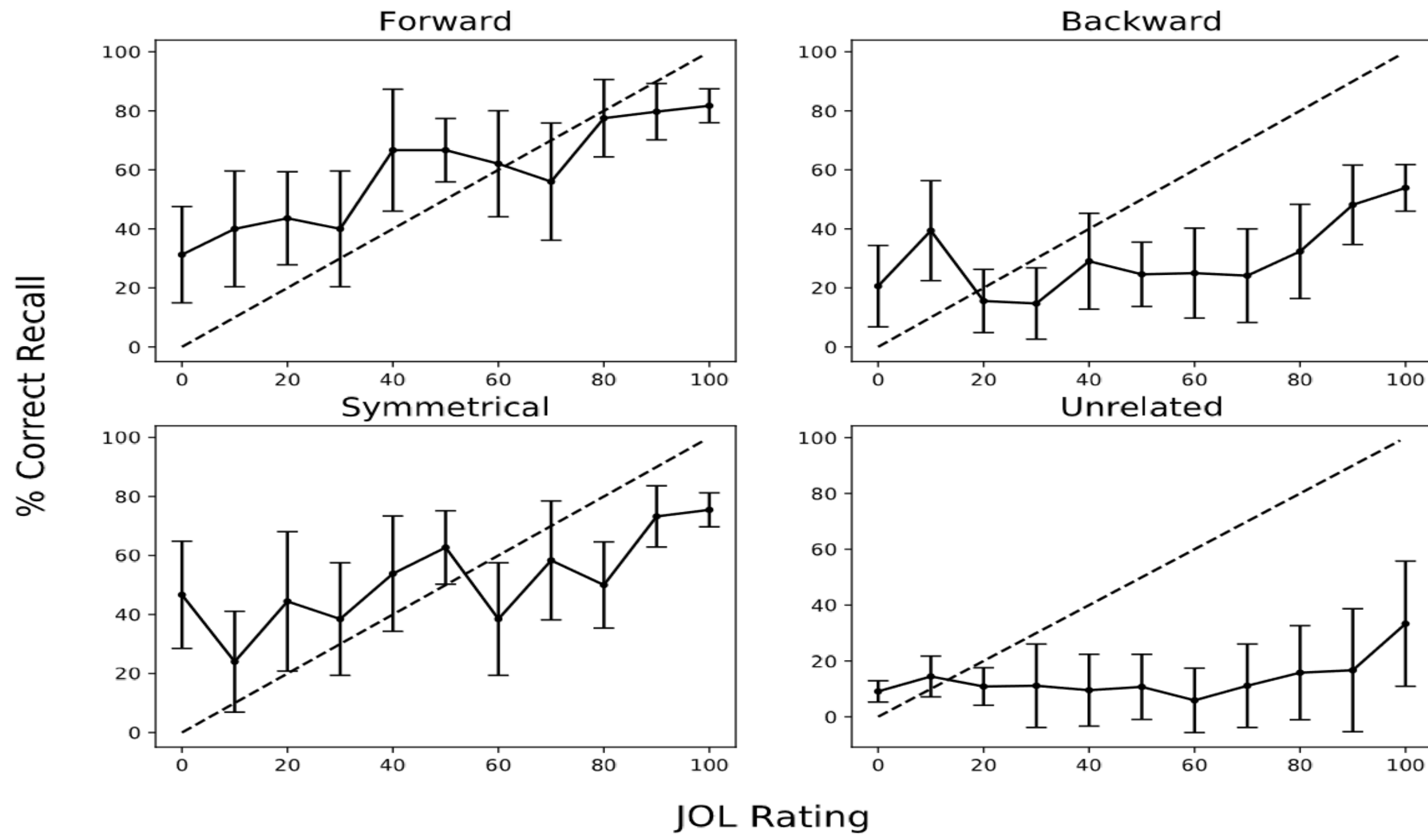
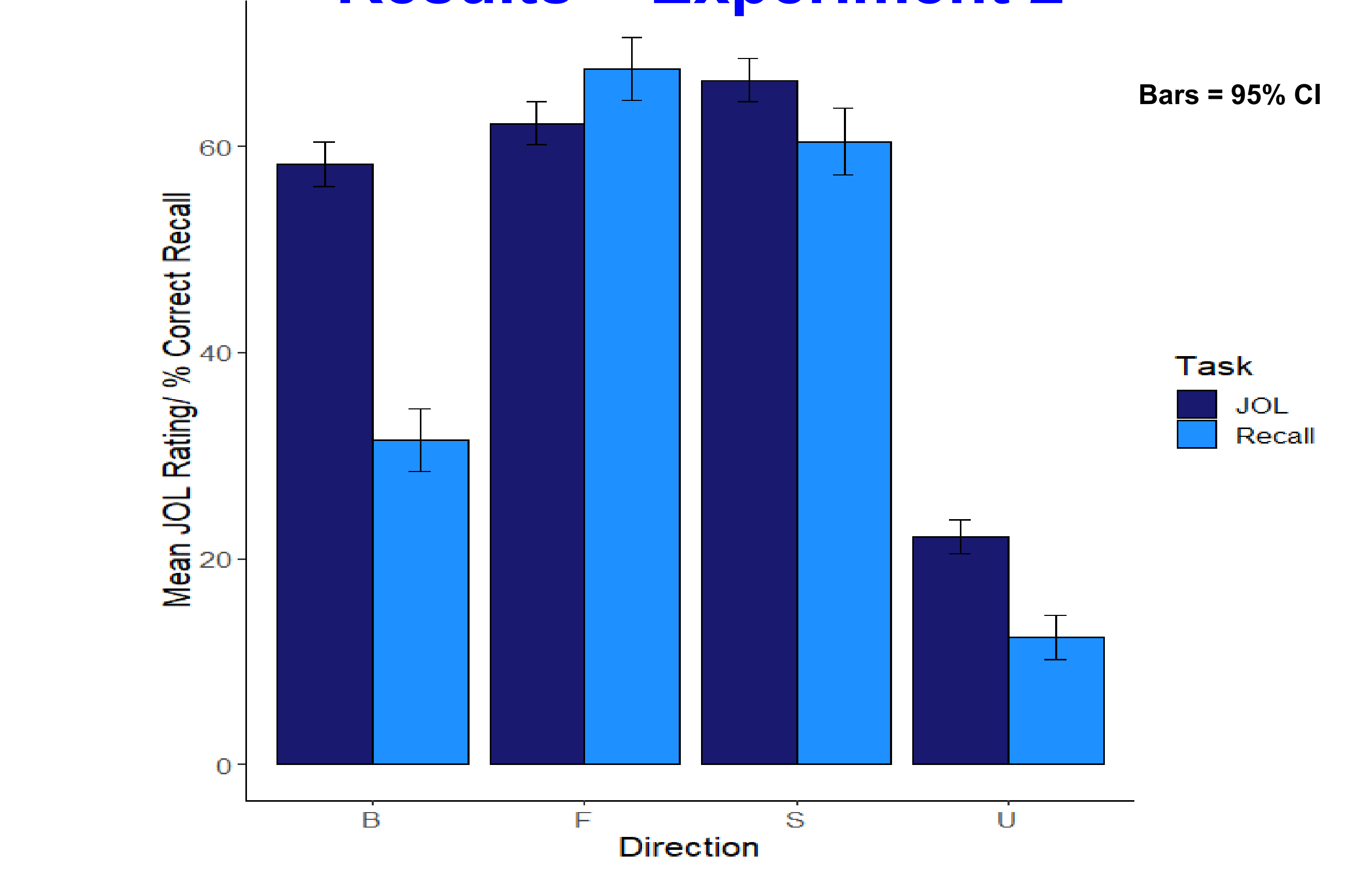
Experiment 1: Self-paced study/JOL ratings for each word pair

Experiment 2: Study/JOL deadline of 5 sec

Results – Experiment 1



Results – Experiment 2



Conclusions

Replicating previous work, Experiment 1 showed that JOL ratings for backward pairs exceeded later recall accuracy—an illusion of competence. A similar pattern was found for symmetrical and unrelated pairs, though the pattern was less robust. Forward pairs in contrast, were well calibrated. Calibration plots indicated that JOL overconfidence similarly differed across pair types with symmetrical and forward overconfidence only occurring for relatively high JOL ratings (80% or greater), whereas backward and unrelated pairs showed JOL overconfidence at much lower ratings.

Experiment 2 examined whether including a deadline for study and JOL ratings would affect JOL/Recall calibration. While it was expected that less time spent at encoding should result in fewer items correctly recalled (thus increasing the illusion of competence), findings from Experiment 2 do not support this. Instead, we conclude that the high calibration of forward pairs makes them resistant to illusions of competence, even when limited time is allocated for study and judgment making.

Our analyses improve upon existing work (e.g., Koriat & Bjork, 2005; Castel et al., 2007) by assessing the relationship between JOLs and accuracy across JOL ratings and by controlling for potential item effects that may have clouded data interpretations in previous work. Our data indicate that both forward and backward associations are perceived and that participants provide similar JOLs for both types, but backward associates provide less effective cues at test and participants do not adjust their JOLs. Future work will evaluate other means to improve JOL/recall accuracy calibration by training participants about how backward associates can mislead memory estimates.