How Much is Remembered as a Function of Presentation Modality?

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ABSTRACT

According to a widespread claim often used for teaching recommendations, students remember 10% of what they *read*, 20% of what they *hear*, 30% of what they *see*, and 50% of what they *see* and *hear*. Clearly, the percentages cannot be correct, and there is no empirical evidence even for the ordering. To investigate the ordering, we used a laboratory paradigm that has already revealed some findings regarding the ordering of modalities for remembering information. In this paradigm, subjects are given messages instructing them to move in a grid of 4 stacked matrices by clicking a computer mouse. The current experiment compared 3 modalities presented either once, *see* (visual arrows), *hear* (auditory words), *read* (visual words); twice in succession, *see see*, *hear hear*, *read read*; or in two different successive modalities, *see hear*, *hear see*, *see read*, *read see*, *hear read*, *read hear*. We found better performance for messages presented twice than for those presented once, regardless of modality. For the twice-presented messages performance varied as a function of the second modality, with best performance overall for *see* and worst overall for *read*.

BACKGROUND

It has been stated that students remember 10% of what they read, 20% of what they hear, 30% of what they see, and 50% of what they see and hear (Dale, 1969). Obviously the percentages cannot be so perfectly ordered, but is the order even correct?

This study looks at three modality types (*hear*, *read*, and *see*) and the number of times (once or twice) that navigation instructions are presented to explore which type or combinations of types are most effective for executing the movements given. Following Schneider et al. (2004, 2011) and Healy et al. (2013), subjects received navigation instructions referring to a 2-dimensional display of a 3-dimensional space containing four stacked 4x4 grids and followed them by mouse clicking on the cells of the grids (see Figures 1 and 2).

METHOD

- Subjects were given 72 messages, 12 of each of six lengths (one to six commands).
- Accuracy was scored in an all-or-none fashion on each trial.
- 144 college undergraduates participated.

DESIGN

Between Subjects Variables
Modality Type: Hear, Read, See
Presentation Number: Once (Single), Twice (Double)
Presentation Mode: Hear (H), Read (R), See (S),
Hear Hear (HH), Read Read (RR), See See (SS),
Hear Read (HR), Hear See (HS), Read See (RS),
Read Hear (RH), See Hear (SH), See Read (SR)

Within Subjects Variable
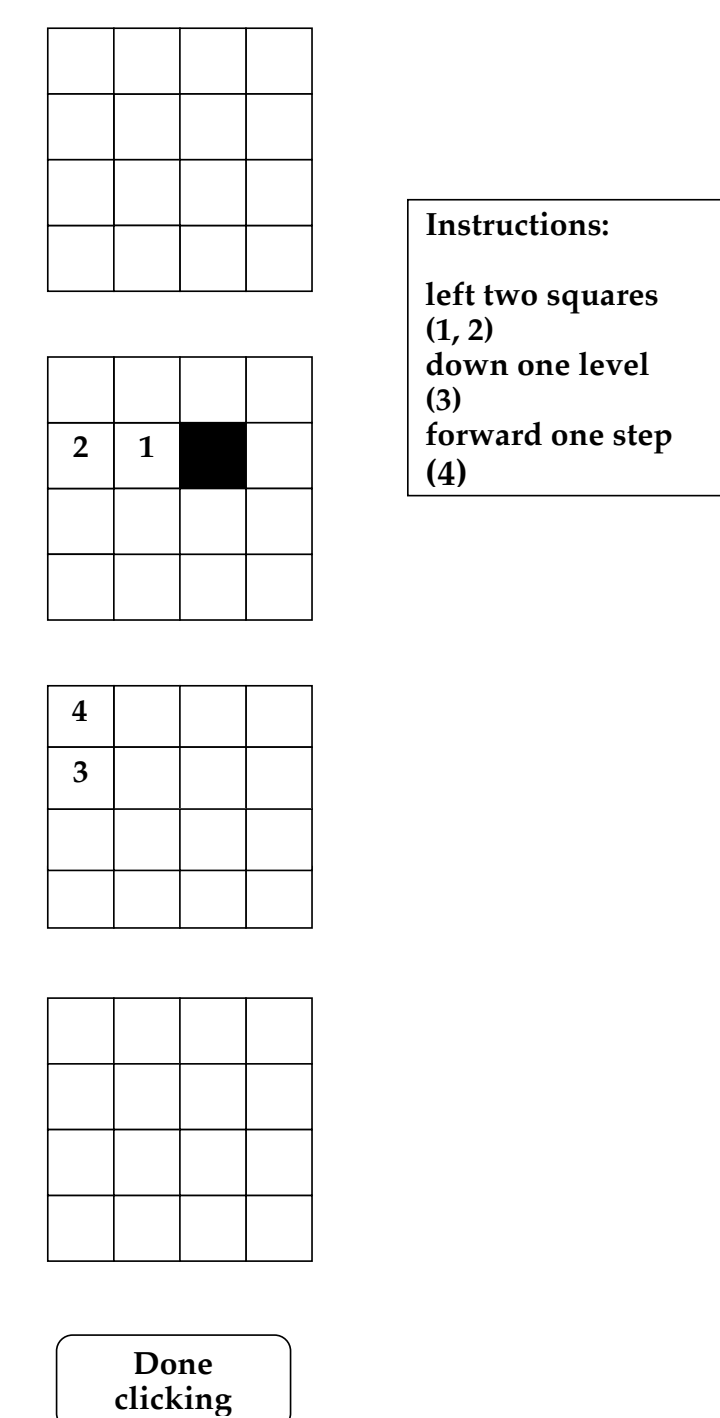Message Length: 1 to 6 commands

Figure 1: A sample display showing movements for a message with 3 commands. Commands are seen in the *Read* presentation mode and heard in the *Hear* presentation mode; digits on the display here show required moves and are not seen by the subjects.
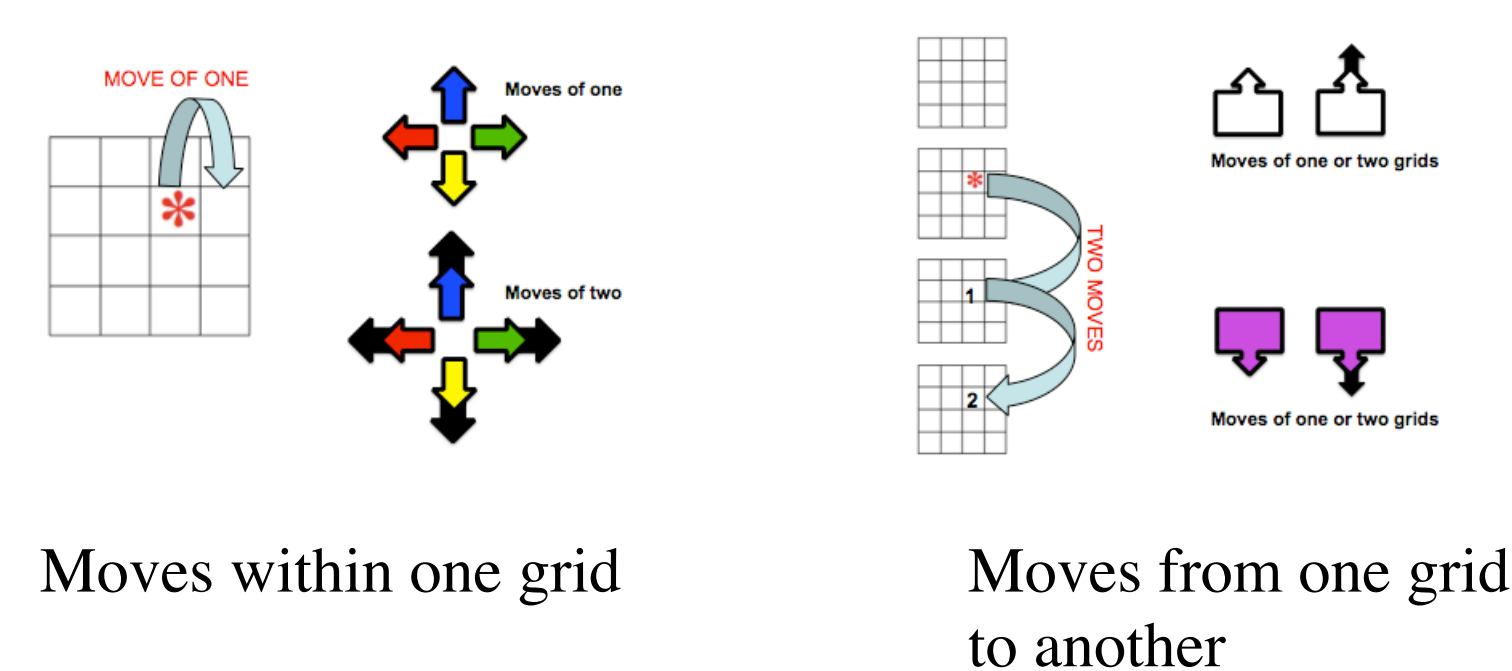

Moves within one grid   Moves from one grid to another

Figure 2: Symbols used for *See* presentation mode
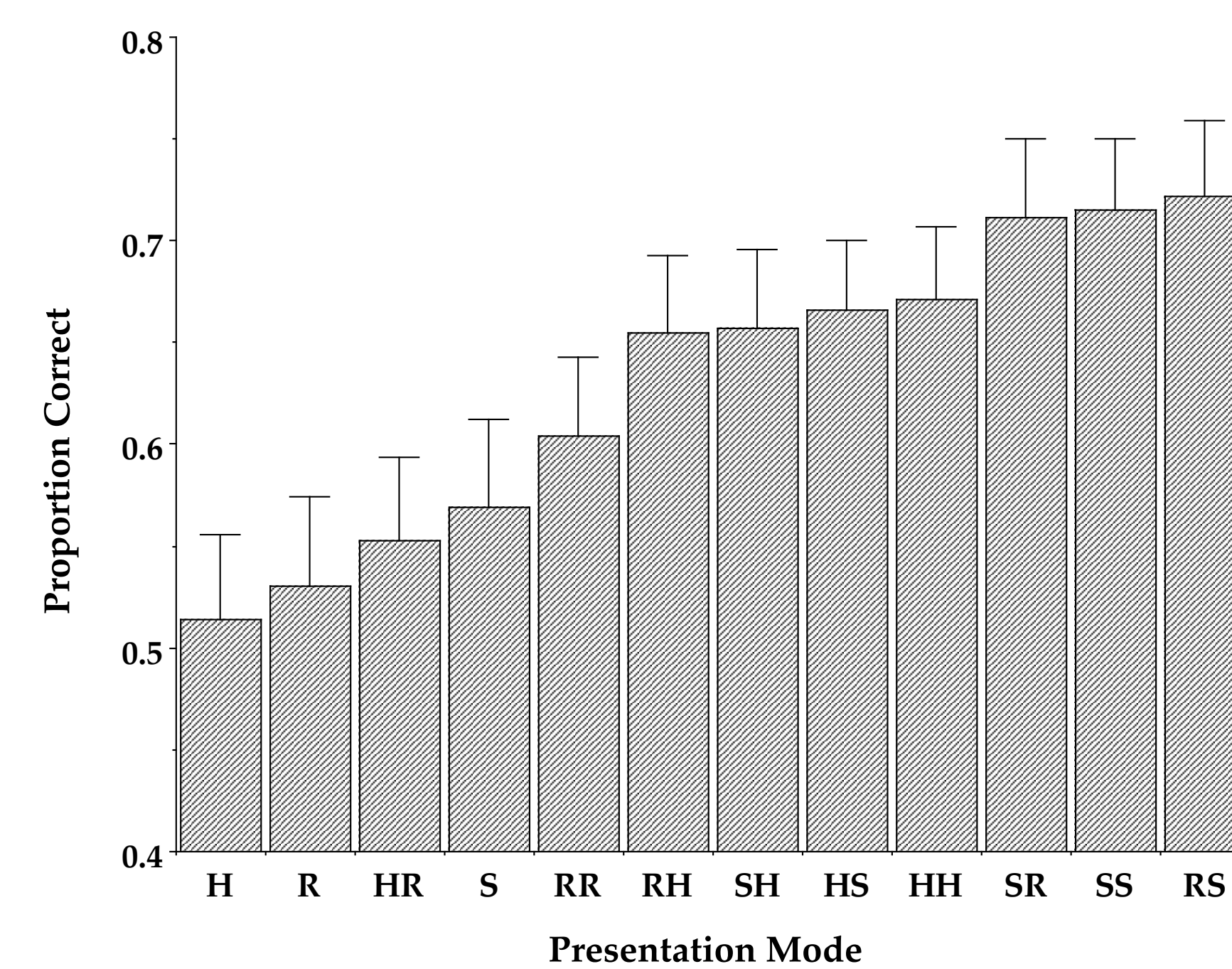
RESULTS

Figure 3. Proportion of correct responses as a function of presentation mode, with the modes ordered in terms of increasing accuracy.

RESULTS

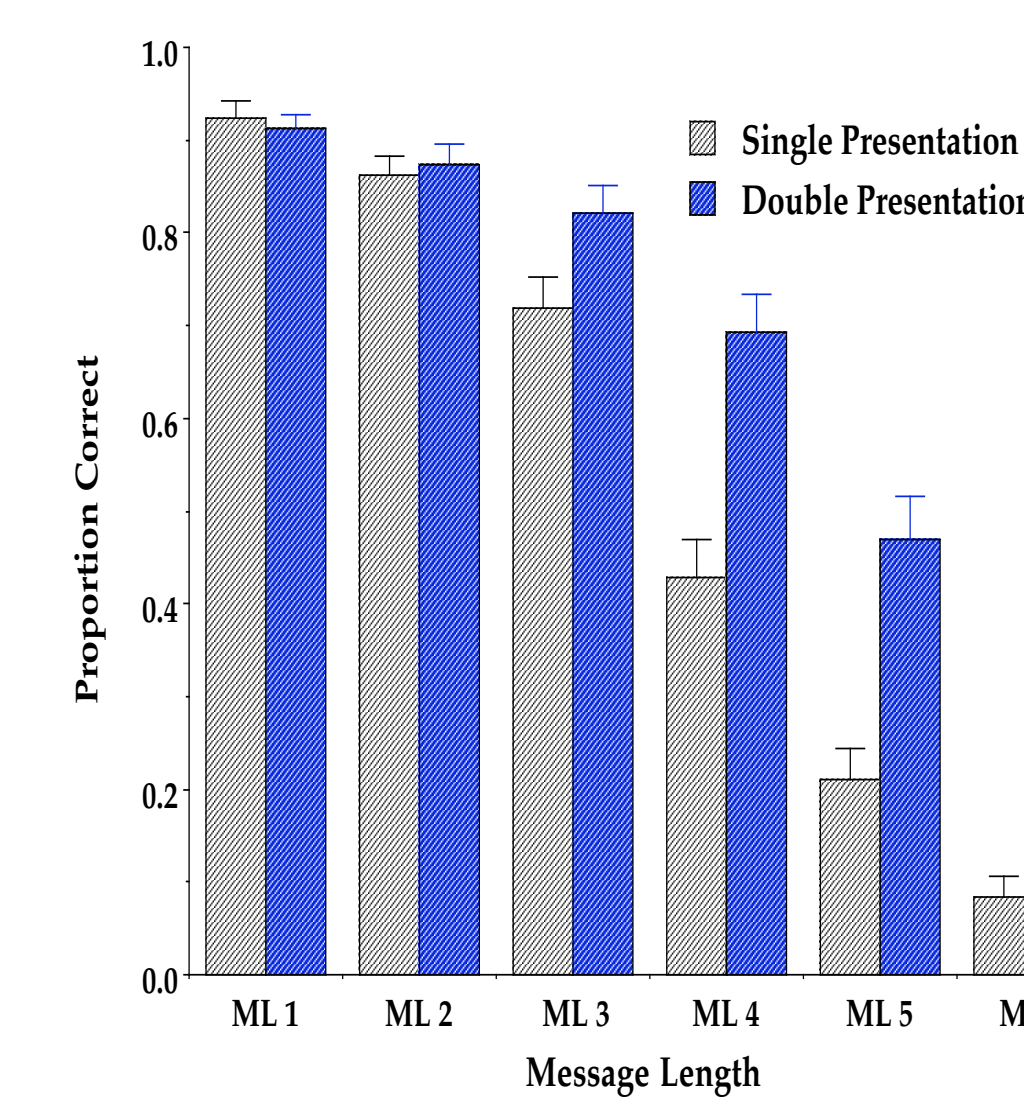Figure 4. Proportion of correct responses for the presentation modes involving a single modality (*Hear, Read, See*) as a function of number of presentations (single, double) and message length.
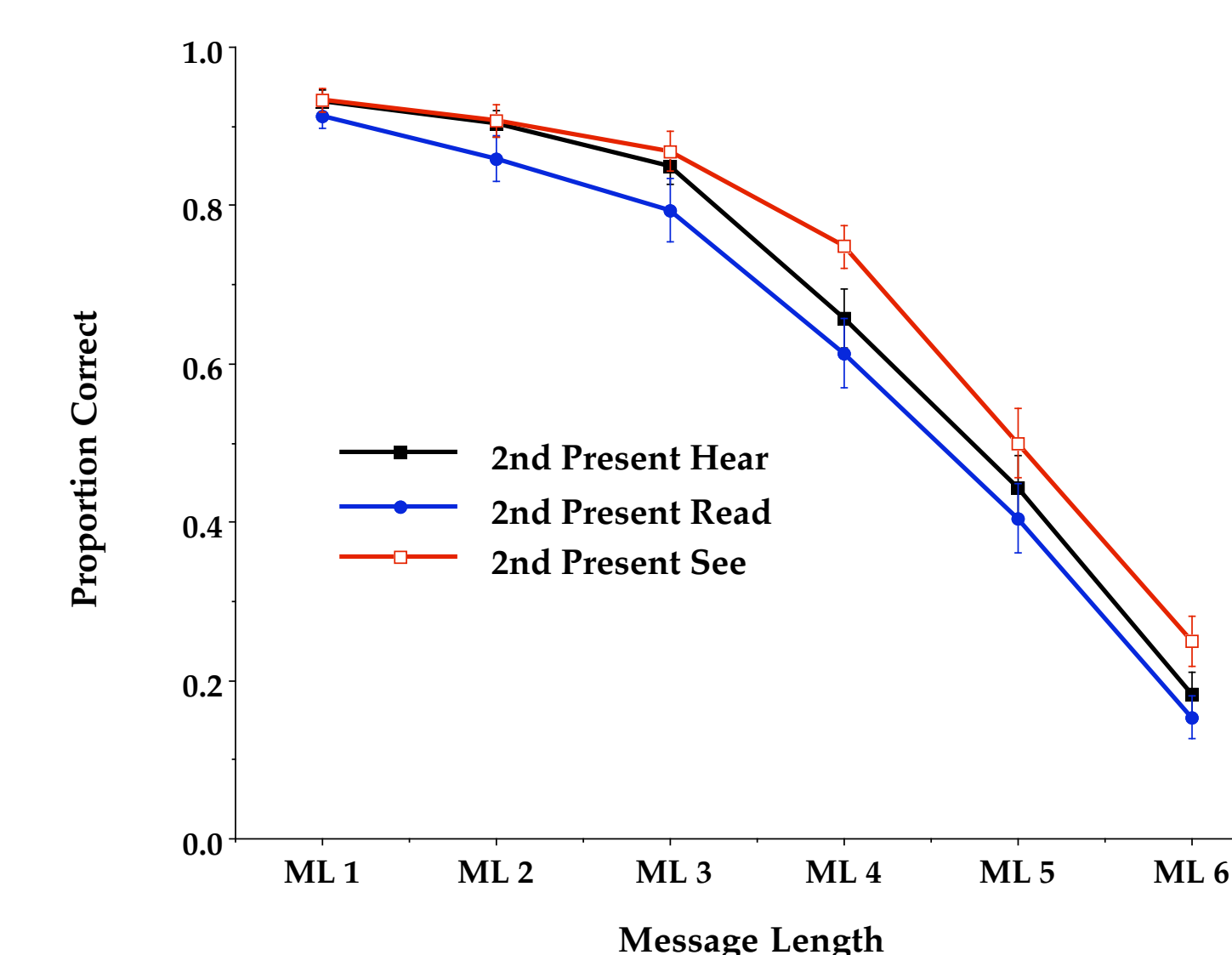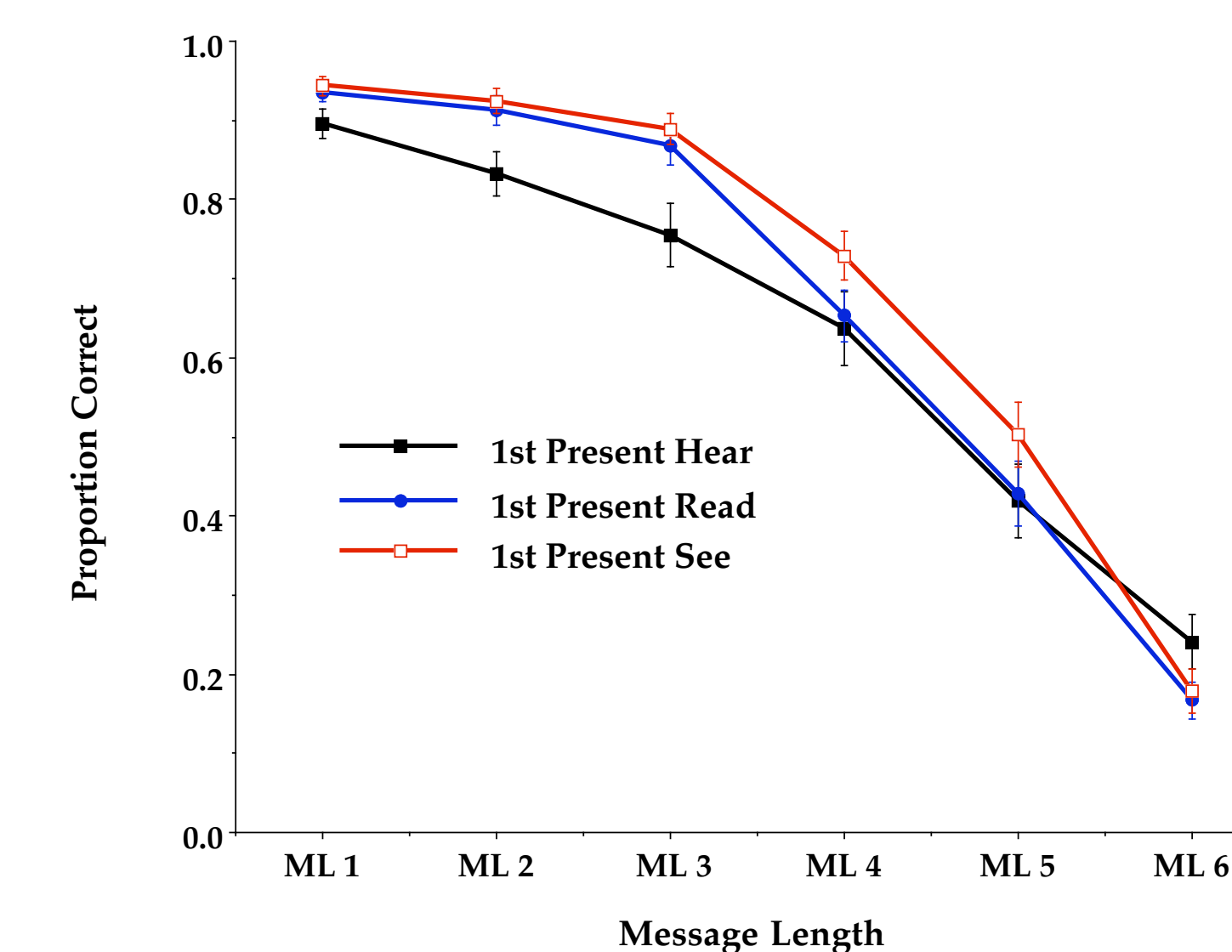

Figure 5. Proportion of correct responses for the presentation modes involving two presentations of the messages as a function of message length and either the modality of the first presentation (top panel) or the modality of the second presentation (bottom panel).

Note. All error bars in the figures are between-subjects standard errors of the mean.

CONCLUSIONS

When all 12 presentation modes are considered, there was a significant effect of presentation mode, reflecting, in part, the fact that the presentation modes with only one presentation yielded especially low performance and performance was best for the modes involving both *See* and *Read* (*See Read* and *Read See*) or *See* duplicated (*See See*) (Figure 3).

For the presentation modes involving a single modality, there was a significant effect of presentation number and a significant interaction of presentation number and message length. Double presentations yielded higher accuracy than single presentations for the longer message lengths where performance was not at the ceiling (Figure 4).

For the presentation modes involving two presentations of the messages, there was a significant effect of the modality of the second presentation, with the overall ordering in agreement with that proposed by the widespread claim (*Read, Hear, See*). The effect of the modality of the first presentation was not significant but also showed an overall advantage for *See* although *Read* was numerically better than *Hear* (Figure 5).

The widespread claim indicates that *See Hear* (and *Hear See*) is better than *See* alone and *Hear* alone, but the present results show that *See Hear* and *Hear See* were actually numerically lower than *See See* and *Hear Hear*. The widespread claim does not control for the number of presentations, which had a large effect. Also, *Hear Hear* was at least somewhat better than both *Read Hear* and *Hear Read*. Because two presentations in a single modality was sometimes better than presentations in two different modalities, the present results only partially confirm the ordering in the widespread claim.

REFERENCES

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AUTHOR NOTE