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, see, read, see, hear, 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)
- Message Length: 1 to 6 commands

Within Subjects Variable
- Message Presentation: 1st Present Hear, 1st Present Read, 1st Present See
- 2nd Present Hear, 2nd Present Read, 2nd Present See

RESULTS

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.

Figure 2: Symbols used for See presentation mode

Figure 3: Proportion of correct responses for the presentation modes involving only one presentation (single, double) and message length.

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).

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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