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Cognitive Style and Integration of Verbal and Visual Information

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Cognitive style refers to an individual's preferred and habitual approach to organizing and representing information (Riding & Rayner, 1998). One of the most widely used cognitive styles is the distinction between verbalizers and visualizers. If the verbalizer/visualizer distinction were valid, the presentation order of verbal and visual information should affect learning differently. That is, verbalizers should learn better when verbal information is presented prior to the visual information, whereas visualizers would benefit when visual information is presented prior to the verbal information.

Methods

Ninety-eight Sungkyunkwan University students, selected out of 160 students based on their scores on a cognitive style questionnaire (Kirby, Moore, & Schofield, 1988), participated in the experiment. They studied three Korean historic sites using two different versions of instructional material. Forty-eight students, twenty four verbalizers and twenty-four visualizers, studied using text with video clips presented on computer monitors (text condition). Text and video clips were presented on the monitor screen. Fifty students, twenty-five visualizers and twenty-five verbalizers, studied with narrations and video clips on monitor screens (narration condition). Instructions for each site consisted of seven segments, each of which lasted twelve to fourteen seconds. In the visual first condition, video clips for each segment started three seconds prior to the start of text presentation, and the screen for the video clips remained blank after the end of the segment until the presentation of the text segment ended. In the simultaneous condition, both text (or narration) and the video clips of the segment started simultaneously. In the verbal first condition, text (or narration) started to play three seconds prior to the start of the video clips, and the monitor screen for the text remained blank or silent until the video clips of the segment ended. After students finished studying three sites, they answered twelve retention questions, four for each site, for four minutes, and twelve integration questions, four for each site, for eight minutes.

Results and discussion

The number of correct answers for the retention questions and the integration questions were analyzed. The interaction effect of cognitive style and the presentation order in the retention test was significant in the narration condition ($F(2,96)=6.97, p<.01$), and marginal in the text condition (F

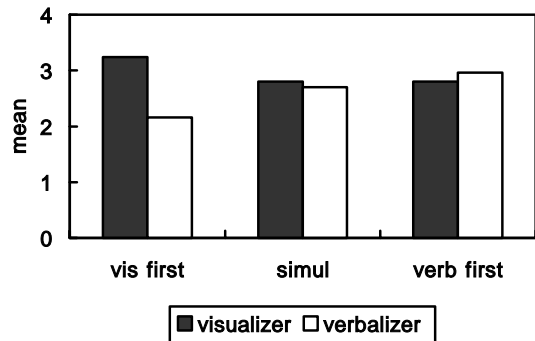


Fig 1. Average mean retention score as a function of cognitive style (visualizer vs verbalizer) and order of visual and verbal information (vis first: visual precedes, simul: visual and verbal simultaneously, verb first: verbal precedes)

($2,92$)= $2.84, p<.06$). The pattern of the interaction effect in the integration test was similar to that of the retention test, but failed to reach statistical significance. As was shown in Fig. 1, visualizers got the most benefit when the visual information was presented first, compared to the simultaneous and verbal first condition ($F(1,24)=3.04, p<.09$, and $F(1,24)=3.61, p<.07$, respectively). Whereas verbalizers retained more information when the verbal information was presented first, compared to the visual first condition and simultaneous condition ($F(1,24)=8.35, p<.01$, $F(1,24)=6.68, p<.02$, respectively). The results suggested that the multimedia instructional material would be better if separately prepared for visualizers and verbalizers.

Acknowledgements

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