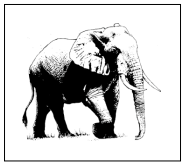
An Auditory Picture Superiority Effect

Robert J. Crutcher & Jenay M. Beer
Department of Psychology, 300 College Park, University of Dayton, Dayton, OH 45469-1430
Presented at the *Psychonomic Society Meeting* in Houston, Texas, November, 2006

Introduction

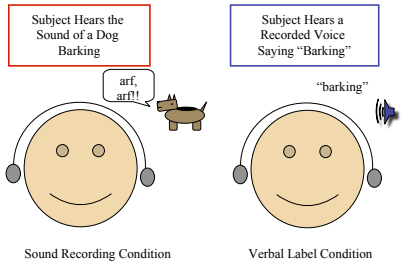
Research shows that pictures are remembered better than words: for example, a picture of an elephant is remembered better than the word *elephant* (e.g. Paivio, Rogers, & Smythe, 1968). One explanation of this *picture superiority effect* is dual coding theory (Paivio, 1986). When we read *elephant*, we encode the stimulus verbally. However, when we see a *picture* of an elephant, we store both a verbal and a visual representation.



Elephant

Experiment 1

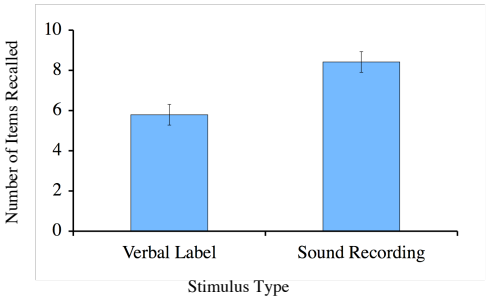
In the current studies, an auditory analog of the task used for the *picture superiority effect* was developed.



Method: Single factor RM design with type of stimulus (spoken verbal label versus sound recording) as the independent variable of interest. Forty stimuli were presented one at a time on a computer screen. Half of the stimuli were recorded sounds (e.g. a dog barking) while the other 20 stimuli were spoken verbal labels (e.g. a voice saying "*barking*"). Afterwards, subjects free recalled all items presented by writing down the labels for the items.

Results: Recall was greater for the recorded sounds (M = 8.4, SE = .5) compared to the verbal labels (M = 5.8, SE = .53), $t(23) = 3.494$ $p = .002$.

Exp 1: Mean Recall as a Function of Stimulus Type

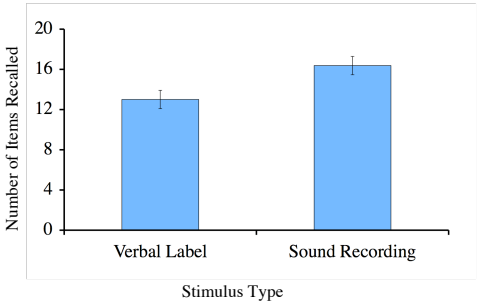


Experiment 2

In Experiment 2 the stimulus type (verbal label versus recorded sound) was manipulated between groups. Forty-eight subjects were randomly assigned to either the verbal label or the recorded sound condition.

Results: Recall was greater for the recorded sounds (M = 16.4, SE = .95) compared to the spoken verbal labels (M = 13.0, SE = .87, $t(23) = 2.615$, p = .012.

Exp 2: Mean Recall as a Function of Stimulus Type

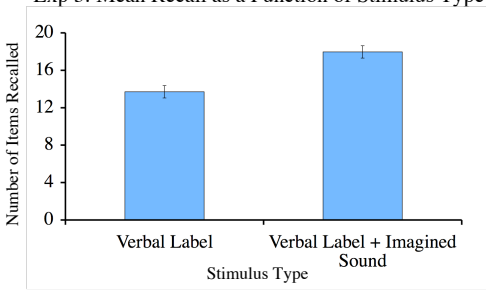


If dual coding theory accounts for the superiority of sound recordings over verbal labels alone, then listening to a spoken verbal label and *imagining* the corresponding sound might produce comparable recall to a recorded sound itself. Experiment 3 tested this possibility.

Experiment 3

Method: A single factor between subjects design with type of stimulus (spoken word vs. spoken word + image) as the the independent variable of interest. Participants either heard the 40 spoken verbal labels alone (verbal label condition) or heard the spoken label and were to *imagine* the sound referred to by the label (verbal + imagined sound condition).

Exp 3: Mean Recall as a Function of Stimulus Type



Results: Recall was greater for the verbal label + image (M = 18.0, SE = .79) than spoken verbal labels alone (M = 13.7, SE = ..53), t(46) = 4.475, p = .00005.

Summary

Experiments 1 and 2 provide evidence for an auditory picture superiority effect in which recorded sounds are recalled better than spoken verbal labels for those sounds. Experiment 3 provided evidence that the advantage may be accounted for by a dual coding account, as evidenced by higher recall for the verbal labels when participants *imagine* the sound. Moreover, recall scores for the verbal label + imagined sound condition were equivalent to those for the sound recording condition of Experiment 2. A follow-up study with all 3 types of stimuli (verbal label, sound recording, and verbal label + imagined sound) is planned.

References

Paivio, A., Rogers, T. B. & Smythe, P. C. (1968). Why are pictures easier to recall than words? *Psychonomic Science,* 11, 137-138.

Paivio, A. (1986). *Mental representation: A dual coding approach.* New York: Oxford University Press.