

Running head: SIMPLE REACTION TIME

Simple Reaction Time as a Function of Visual Versus Auditory
Modality Stimulated and Preferred Versus Nonpreferred Hand Used
In Responding

John X. Doe

The University of Tennessee at Martin

Abstract

Simple reaction times of college students to visual and auditory stimuli were compared. The generally obtained finding of shorter reaction times to an auditory stimulus was confirmed. Reaction time to an auditory stimulus was found not to differ significantly for the preferred and nonpreferred hands, again in agreement with previously obtained results.

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Studies of reaction time were very prominent among the investigations conducted in the first laboratories of psychology. Reaction time experiments provide a good example of the formulation which states that a response depends on both the nature of the stimulus and the structure or state of the responding organism.

Typically, reaction time to a visual stimulus is found to be longer than reaction time to an auditory stimulus (Woodworth & Schlosberg, 1954). Representative of studies comparing reaction times with the preferred and nonpreferred hand is an investigation by Seashore and Seashore (1941) which yielded no significant difference.

The modality stimulated and the effector employed were both varied in the present study.¹ The problem was to determine if a significant difference exists between the reaction times for (1) auditory and visual stimulation and (2) preferred and nonpreferred hands.

Method

Participants

The subjects were 22 male college students, 18 to 23 years old, drawn at random from 68 introductory psychology student volunteers at The University of Tennessee at Martin.

Apparatus

The reaction time device (Lafayette Instrument Company, Model 63030) was of the conventional type with a single response key to be pressed by the subject as soon as possible after the presentation of a stimulus. The response stopped a standard laboratory timer which had been started when the experimenter operated a switch to present the stimulus. The timer

permitted the determination of reaction time to the nearest hundredth of a second. The visual stimulus was a green-jeweled pilot lamp with a neon bulb used to eliminate filament lag. The auditory stimulus was a 2800 Hz sonalert. Both the stimulus devices and the response key were mounted on a square box and separated from the experimenter's control module by a plywood panel.

Design and Procedure

All subjects were given 10 practice trials with each of the stimuli to acquaint them with the operation of the apparatus. They were instructed to react as quickly as possible on every trial. With the preferred hand used in responding, every subject was then given 30 trials with each of the stimuli. A particular stimulus was presented for a block of 5 consecutive trials. The blocks of 5 trials were counter-balanced for the two stimuli, half of the subjects getting their first trials with the light, half with the buzzer.

In the second part of the experiment, only the auditory stimulus was used. The preferred and nonpreferred hands were used in responding in counterbalanced blocks of 5 trials, as had been used earlier for the two stimuli.

Every stimulus presentation was preceded by the experimenter's calling "ready." A foreperiod that varied from 1 to 3 seconds intervened between this warning and the stimulus. On approximately 1 trial out of 10 no stimulus was given following the ready signal. If the subject responded on such a "catch test," the data for the entire block of 5 trials were discarded, to be replaced by data collected in an extra block of trials given later.

Results

Reaction times to the auditory stimulus were shorter than the reaction times to the visual stimulus. The means and standard deviations of these reaction times are presented in Table 1.

TABLE 1 HERE

A test of significance of the difference between the means presented in Table 1 yielded a value of $t = 8.59$ which for 21 degrees of freedom is significant at beyond the 1 percent level of confidence.

Figure 1 indicates that there was no improvement in reaction time to either stimulus over the 30 trials.

FIGURE 1 HERE

For reactions to the auditory stimulus, the preferred and nonpreferred hands did not differ significantly. The means and standard deviations of the reaction times for the preferred and nonpreferred hands are given in Table 2.

TABLE 2 HERE

Discussion

Auditory reaction time was shown to be significantly shorter than reaction time to a visual stimulus when both types of stimuli were presented to the same subjects. This finding is in general agreement with data reported by Woodworth and Schlosberg (1954). The values obtained in the present experiment were somewhat greater than those cited in the literature. Among the factors which might have accounted for this are lack of sufficient training for the subjects and distractions occurring in the laboratory while the experiment was in progress.

No significant difference was obtained between the reaction times to an auditory stimulus by the preferred and nonpreferred hands. The finding of no difference for the two hands agrees with the results obtained by Seashore and Seashore (1941). Against the values were some what

greater for the present study, possibly for one or both of the reasons cited above. The apparent equality of performance of the two hands in such a simple reaction may not extend to tasks requiring dexterity in which the preferred hand could reasonably be expected to show superiority.

References

Seashore, R. H., & Seashore, S. H. (1941). Individual differences in simple auditory reaction times of hands, feet, and jaws. Journal of Experimental Psychology, 9, 346-349.

Woodworth, R. S., & Scholosberg, H. (1954). Experimental Psychology. New York: Holt.

Footnotes

¹This experiment was fabricated by David A. Gibson to serve as an APA publication format guide for laboratory courses taught in the Department of Psychology, Philosophy, and Religious Studies, The University of Tennessee at Martin. Because these data do not exist, reprints of the article are not available. Had this experiment actually been carried out and published, reprints would be made available from the author.

Table 1

Means and Standard Deviations of Reaction Times (in 1/100 sec) to Auditory and Visual Stimuli

	Auditory Stimulus	Visual stimulus
Mean	15.8	19.4
Standard Deviation	3.0	3.2

Table 2

Means and Standard Deviations of Reaction Times (in 1/100 sec) by the Preferred and Nonpreferred Hands

	Preferred	Nonpreferred
	Hand	Hand
Mean	15.4	15.3
Standard Deviation	2.3	2.1

Figure Caption

Figure 1. Mean reaction times of subjects to auditory and visual stimuli as a function of trials.