The Auditory Attentional Blink is Absent When Tested with Monosyllabic Words

Introduction

The Attentional Blink

Identification of the second target (T2) in a rapid-serial-visual-stream (RSVP) is severely impaired if it is presented within a 500 ms of the first target (T1), a phenomenon called the attentional blink (AB; Raymond, Shapiro, & Arnell, 1992).

An auditory AB has been reported with pure tones (Goddard, Isaak, Slawinski, & Brown, 2004), complex tones (Vachon, 2005; Shen, 2006), and monosyllabic nonsense syllables (Tremblay, Vachon, & Jones, 2005) as stimuli and targets.

The present study, using Tremblay et al. (2005) as a methodological base, examined the auditory AB using monosyllabic neutral words as stimuli and targets (Experiments 1-3) as well as nonsense syllables (Experiments 4-5).

General Methodology

In all experiments, lists of 12 to 20 items were presented over stereo headphones using E-Prime software. 6-10 items were presented before T1 and 4 items after T2. At the end of each list, participants typed their responses. Word stimuli were recorded with Adobe Audition. Experiment details are presented in the table.

Experiment 1

Selection of female voice targets was very easy; T2|T1 was as high as T1. There was no lag effect on T2/T1, and thus no evidence of an AB. In Experiment 2, targets were defined by category.

Experiment 2

Although participants simply had to identify which two of five animal names were presented, the task was more difficult than Experiment 1, as reflected in lower T1 accuracy. There was lag effect on T2/T1, but it reflected enhanced lag 1 performance. Thus, there was no evidence of an auditory AB. To ensure that words were perceived as separate items, 5 ms of pink noise was added between words in Experiment 3.

Experiment 3

When the words were clearly separated with pink noise, accuracy was higher on T1, but there still was no lag effect on T2/T1. Once again, there was no evidence of an auditory AB. Because we were unsuccessful finding an auditory AB with words, in Experiment 4 we switched to a binary decision between two nonsense syllables for both T1 and T2, the procedure used by Tremblay et al. (2005).

Experiment 4

Although our stimuli and procedure replicated Tremblay et al. (2005), our participants found the task more difficult. T1 was barely above chance (50%). There was no lag effect on T2/T1, and thus no evidence of an auditory AB. In a final attempt to find an auditory AB, we used stimuli obtained from Tremblay et al. in Experiment 5.

Experiment 5

The results were similar to those found in Experiment 4. Accuracy was low and there was no lag effect on T2/T1. Even while using the original stimuli from Tremblay et al. (2005), we were unable to find an auditory AB.

General Conclusions

In five experiments, there was no evidence of an auditory AB with either monosyllabic words or nonsense syllables. As described in the Introduction, the literature contains reports of an auditory AB, particularly with tones. Tremblay et al. (2005) were successful with nonsense syllables, but others (e.g., Potter, Chun, Banks, & Muckenhoupt, 1998) failed to find an effect with auditory digits and letters.

Perhaps our failure to find an auditory AB is due to the nature of the auditory sensory buffer, or ‘echoic store’, which lasts 2-3 seconds (Crowder & Morton, 1969) for verbal stimuli. The inability to replicate the results of Tremblay et al. (2005) with their own stimuli is difficult to explain. Our T1 accuracy was lower and T2/T1 was near the floor. We are currently trying to identify what difference in procedure, software, and/or equipment is responsible for the failure to replicate.

References


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May 3, 2007, Chicago, IL

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