Does one's own name attract visual attention?

Jun-ichiro Kawahara

Department of Psychology, Hiroshima University
Hiroshima, Japan

Does one's own name attract attention? To answer this question, the present study conducted four experiments. Experiment 1 replicated Bundesen, Kyllingsbaek, Houmann, and Jensen (1997) and found no evidence for attentional attraction by observer's own name. Experiments 2 and 3 showed that Bundesen et al.'s two arguments did not explain the null effect. Experiment 4 directed the observer's set to identify names and revealed attentional attraction by observer's own name. These four experiments, using Japanese names, revealed that attentional attraction to the observer's name depends on the observer's set.

Key words: attentional attraction, observer's set, visual cocktail party effect.

Introduction

Does one's own name attract attention? This question has been asked in many studies investigating the locus of selection of information (Moray, 1959). Studies using dichotic listening task have produced consistent evidence suggesting the attentional valence of participant's name.

With respect to visual modalities, the picture is not very clear; some researchers have provided evidence favouring the notion that visual attention can be captured by the observer's name, while others have not. As a piece of affirmative evidence, Shapiro, Caldwell, and Sorensen (1997) conducted a set of experiments in which observers searched for two targets embedded in a rapid stream of distractors; their results revealed a visual "cocktail party" effect. Specifically, the observers were successful at detecting their own name as a second target, but were less successful at detecting another person's name or a noun.

By contrast, Bundesen, Kyllingsbaek, Houmann, and Jensen (1997) reported that visual attention was not automatically attracted by the observer's own name. Bundesen et al. (1997) modified Shiffrin and Schneider's (1977) paradigm so that each display contained four different Danish first names; two were coloured in red and the others white. The observers ignored white names (distractors) and reported the red names (targets). The critical comparison was set up to see if there was any difference in the performance of reporting others' names between trials in which the observer's own name was presented as one of the distractors (the distractor condition) and those in which the observer's own name was not presented (the absent condition). Bundesen et al. predicted a deteriorated performance for the distractor condition, if attention was automatically attracted to the name. They found that presenting the observer's name as a distractor produced no more interference with report of targets than did presenting other names as distractors. Based on this evidence, Bundesen et al. concluded that the observer's attention is not automatically attracted by his or her own name.

On the face of it, there is an apparent inconsistency in terms of the valence of an observer's name in the visual domain. The purpose of this study was to examine the two possibilities (see Experiments 2 and 3) suggested by Bundesen et al. (1997) in an attempt to determine what produces this inconsistency and to provide an alternative view.

EXPERIMENT 1

First, we replicated the study of Bundesen et al. (1997) with Japanese participants. The participants observed a brief display containing four different peroples' names (two were coloured red, and the other two were white), and reported the red names. We compared the percentage of correct report for the targets (red names) in the distractor condition in which the participant's name appeared as one of the distractors (white names) with that in the absent condition in which the participant's name did not appear. If participant's name attracts attention, then the percentage of correct reports will be higher in the absent condition than in the distractor condition. Conversely, as Bundesen et al. (1997) predicted, if the participant's own name does not have attentional valence, then no difference is expected between the conditions.

Method

All the items used as targets and distractors were Japanese names consisted of two Kanji characters. They were 佐藤, 鈴木, 高橋, 田中, 渡辺, 伊藤, 山本, 中村, 小林, 加藤, 吉田, 山田, 山口, 松本, 井上, 斉藤, 木村, 清水, 阿部, and 池田. These are the twenty most common family names in Japan taken from a frequency database.

In the stimulus display, four different names were presented 1.8 deg above, below, to the left, and to the right of a blue fixation point. Of the four names, two were pre

sented in red, and the other two were in white, with a black background.

The probability that a given set of four names from the stimulus ensemble would be presented together in a trial was the same for all four-name subsets of the stimulus set. The probability that the four names would be presented in a particular way over the four display locations was also the same for all possible distributions. The probability that the red names would be found at a given pair of locations was also the same for all pairs of names for the set of four locations. The stimuli were displayed on a monitor controlled by a computer.

Participants initiated each trial by pressing the spacebar. Immediately after the key press, the stimulus was displayed for 150 ms, and was then masked for 500 ms by rectangles of the same colour as the names that they covered. Twenty native Japanese participants were told to ignore distractors (white names) and to report as many targets (red names) as possible.

Results and Discussion

The average proportions of correct reports of the participant's own name, other targets in trials in which the participant's name was presented as another target, individual targets in trials in which the participant's name was presented as one of the distractors, and individual targets in trials in which the participant's name was not presented were 0.67, 0.64, 0.67, and 0.71, respectively.

Experiment 1 replicated Bundesen et al. (1997) and our results were consistent with their study. The difference between the distractor and absent conditions did not reach statistical significance $\chi^2(20) = 20.56$, n.s. In addition, the proportion of correct reports for the other target in trials in which the participant's name was presented as one of the targets was not significantly different from the proportion correct in trials in which the name was absent $\chi^2(20) = 22.08$, n.s. These results were consistent with those of Bundesen et al. (1997), suggesting that the valence of participant's name was not strong enough to attract their attention. In the next experiment, we tested the first possibility of the null effect suggested by Bundesen et al. (1997).

EXPERIMENT 2

In this experiment, we examined one of the untested possibilities of Bundesen et al.(1997), that is the null effect might occur because the selection of items based on a clear colour difference was highly efficient and that few distractors might have been recognised in Experiment 1 of Bundesen et al. (also our Experiment 1). They argued that if more similar colours had been used, then the selection criterion would change. This would result in a more frequent recognition of distractors, and more intrusions of own names in the distractor condition, leading to the possibility that the null effect could been broken.

To test this possibility, we made the colour of the target similar to that of the distractor, by changing it from red to pink. If efficient colour selection excludes the distractor at a very low level of processing, in Experiment 2, the percentage of correct reports of the target in the distractor condition shouldl be lower than that in the absent condition.

The method was identical to that used in Experiment 1, except that the the target and its mask were pink. Twenty Japanese adults, who had not been involved in Experiment 1, participated.

Results and Discussion

The average proportions of correct reports for each of the four conditions in Experiment 1 were 0.38, 0.29, 0.29, and 0.33, respectively. The poorer performance, as compared with Experiment 1 $ts(19) > 3.64$, $p < .005$ indicated that reducing colour salience had an effect and resulted in inefficient target selection. However, the effect of the presence of the participant's name as a distractor on the correct reporting of the targets was not powerful enough to attract attention. One participant showed the pattern $\chi^2(1) = 6.3$, $p < .05$, while the other 19 did not. The overall statistics were far from the significance: $\chi^2(20) = 17.30$, n.s. The comparison between the proportions of correct reports for the other target, in trials in which the participant's name appeared as one of the targets and in trials where this name did not appear, did not provide very clear results. Although the summed statistics rejected the null hypothesis that the two theoretical probabilities were the same, $\chi^2(20) = 33.32$, $p < .05$, the results revealed completely opposite directions that produced significant chi-square values in individual tests. One participant performed better when her/his name appeared as one of the targets, $\chi^2(1) = 5.34$, $p < .05$, while another participant performed relatively poorly in the same situation $\chi^2(1) = 6.76$, $p < .05$. Therefore, it is highly unlikely that the null effect obtained in Bundesen et al. (1997) can be attributed solely to efficient selection by colour.

Experiment 3

Experiment 3 examined the second untested possibility of Bundesen et al.'s (1997), that is, that the null effect of the presence of the participant's name occurs because visual attention can be attracted by individual characters, as used in Shiffrin and Schneider (1977), but not by multi-character words, such as the participant's name. To test this conjecture, we recruited participants whose names used single Japanese Kanji characters. If the number of characters in their name is critical, then the participants' attention will be attracted by their names in this experiment.

The method was identical to Experiment 1, except for the following changes. First, the fifteen participants had single-Kanji-character names. Second, the twenty one-character-names were chosen from the frequency database. They were 森, 林, 原, 堀, 関, 東, 泉, 辻, 南, 岡, 西, 谷 , 堤, 岸, 菅, 星, 平, 畑, 角, and 島.

Results and Discussion

The average proportions of correct reports for the four condition were 0.64, 0.62, 0.60, and 0.64, respectively. These results did not provide evidence affirmative to the hypothesis that the null effect found in Bundesen et al. (1997) was due to the presentation of multiletter words as stimuli. Using one-character names, and recruiting participants with simple names, did not increase the chance of their names attracting their attention. We predicted that if the participants' attention was attracted by their names, then the proportion of correct reports in the distractor condition would be lower than that in the absent condition. However, no such trend was found $\chi^2(15) = 14.72$, n.s. We can conclude that the number of characters in stimuli is not the primary factor responsible for the null effect found by Bundesen et al. (1997).

Our results so far show that the two conjectures suggested by Bundesen et al. (1997) cannot explain the null effect of the participant's name in their study. What is the critical factor, then, that produces the discrepancy found in previous studies? We argue that the observer's set for detecting targets is critical to creating the effect of attracting the visual attention of observer by observer's name. Such an observer's set can is called an input filter (Di Lollo, Kawahara, Zuvic, & Visser, 2001), which is dynamically reconfigured to optimise the performance at hand. Specifically, if the observers set up an input filter for identifying letters, then the observer's name can pass through the filter and may attract their attention. If this is the case, we expect observers to be attracted by their own name if they are tuning their input filters to read names.

Experiment 4

In this experiment, we utilised the attentional blink as the index of attraction of attention to the observer's name as used by Shapiro et al. (1997). The observers (students in the Department of Psychology, Hiroshima University) searched for two of four names of the department faculty embedded in three rapid streams of names. In some trials, the observer's name appeared just before the second target. We predicted that if the observer's name attracted observer's attention then a correct report for the second target would be impaired for those trials in which the observer's name was presented.

Method

All items used as targets and distractors were in the sixty most frequent Japanese family names consisting of two Kanji characters taken from a database. The targets were four of the faculty members in the Department of Psychology, Hiroshima University: 河原, 宮谷, 利島, and 湯澤. The observer's name appeared as a critical distractor, could appear only in the second half of the experiment. The foil name 平野 was presented in the first half. Three names were arranged in three lists and presented as three RSVP streams. Each name was placed at the corners of an imaginary equiangular triangle inscribed in an imaginary circle (2.2 deg radius).

The experiment had a 2 x 2 factorial design. The first factor was the presence or absence of the distractor (own name); if present, it appeared as a distractor in the frame immediately before the second target. The second factor was the lag between the targets (600 or 2100 ms).

Ten adults who had grown up in Japan with Japanese family name of two Kanji characters, participated. The observers initiated each trial by pressing the spacebar. After a delay of 500ms, three RSVP streams of 14-19 frames were presented. Every stream had the same number of names. Each item was presented for 300 ms, and was followed immediately by the next frame. In each trial, one target was inserted in a stream and the other in one of the remaining streams. The first target was presented somewhere from frame 6 to 10. The second target followed the first after either 2 (lag 2) or 7 (lag 7) frames. The second target was followed by another frame. In a trial in which the critical distractor (the observer's name or the foil) was presented, it appeared in the stream that contained no target, and in the frame before the second target. The task of the observers was to identify the two targets and to report them by pressing corresponding keys marked with the names.

Results and Discussion

The proportion of correct reports for the second target at lag 2 were 56.0 and 78.1, when the observer's name was or was not presented, respectively. At lag 7, they were 79.2 and 77.7, respectively. A 2 (lag: 2, and 7 x 100 ms) x 2 (presence or absence of the observer's name) repeated measures analysis of variance of these data showed a significant effect of the presence or absence of the name $F(1,9)=8.81$, $p<.05$ MSe=111.77. This indicates that observers were prone to fail to detect the second target if it followed immediately by after their name.

This result suggests that the observer's own name does have attentional valence, and that it attracts attention contingently on task demands.

General Discussion

This study provided two answers to the question "Does the observer's own name attract the observer's attention?" We found that the name does not attract attention in some cases (Experiments 1 through 3) but that it does others (Experiment 4). These were not contradictory results in terms of the observer's set. Specifically, when observers are set to identify names, the observer's name is detected and causes a deficit in detecting immediately following other targets. This reasoning is consistent with previous evidence suggesting the attentional valence of the observer's own name (e.g., Shapiro et al., 1997). Conversely, when the observers are not initially set to read names but to find other features, such as red items (e.g., Bundesen et al., 1997), their own names are excluded because they do not

fit in the set. This leads to the null effect of own name on attentional attraction. In summary, our four experiments, using Japanese names, revealed that attentional attraction to the observer's name depends on the observer's set.

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