

Selective Attention Ability in Alcoholics and Non-Alcoholics

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Abstract

Selective attention refers to the ability to focus on a particular activity by suppressing the background activities which may be taking place at the same time and the same place. The activity on which the focus is placed is termed as foreground and the other activity taking place simultaneously is called background. The present study aimed at studying selective attention in alcoholics and non-alcoholics by employing non-zero task and lexical decision task. Total of 40 participants were considered for the study out of them 20 were alcoholics (moderate alcoholics on DSM V) and the remaining 20 were non-alcoholics. The lexical decision task posed more load on the participants. The performance was measured through mean reaction time, and accuracy of performance on the two tasks was considered. Non-alcoholics over performed the alcoholic participants on both the tasks, however statistically significant difference was seen only for LDT indicating that the task was a better indicator to reflect the decline in selective attention in alcoholics.

Keywords: Selective attention, non-zero task, lexical decision task

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INTRODUCTION

Cognition is defined as a set of mental abilities that are processed in the brain related to knowledge. The various cognitive processes include attention, memory, problem solving, decision making. In order to understand the information present in our surrounding, we need to be alert and conscious. This underlying process which keeps us vigilant is called attention and it is one of the major cognitive processes that is pivotal in daily life. The major function of attention is to select particular information for processing.

Attention is often grouped under three sub categories namely selective attention, divided attention and sustained attention. According to Kellorg (2007) [1], selective attention is the ability of an individual to focus on particular stimulus by ignoring the distracting stimuli (Lemos and Daniel, 2013) [2]. It involves two underlying processes one paying attention to the desired stimuli and the other one being inhibiting the distractors. Selective attention can be tapped by employing several tasks

based on either visual modality or auditory modality. Stroop color task is the simplest of the measures used, where the name of the color is printed either in the same color (congruent trials) or different color (in congruent trials). Stroop task employs primary colours basically and may not be used in those participants who do not know the colours. Non-zero task is considered as an alternate to this task. In this task, the participant is required to present a desired key to indicate the numerals which are accompanied by zero (0) and press any other key for those numerals which are not accompanied by zero. Lexical decision task can be employed to measure selective attention. In this task, stimulus comprising of words and non-words would be presented and the participants are expected to give differential responses for words and non-words.

Selective attention is studied in children, adolescents, young adults and older adults. It is also studied in clinical population. Few researchers have investigated selective

attention ability in alcoholics. There would be a decline in cognitive abilities in alcoholics as reported by a lot of researchers (Zen, 1991) [3]. The decline of selective attention follows a pattern and is directly proportional to the alcohol use (Scotton, 2001) [4]. However, the extent of decline may not be uniform across all individuals. Several tasks like Stroop task, non-zero task and various tasks have been employed to study selective attention and most of these tasks are non-verbal in nature, it would be interesting to study the selective attention in alcoholics by employing task with linguistic load like the lexical decision task.

The effect of alcoholism on cognitive abilities is studied by many researchers. The tasks employed to study are non-linguistic most of the times. The effect of alcoholism on cognitive abilities by employing a variety of task which employ load on cognitive linguistic system also in order to know to test if this domain also is prone to decline, if yes to study the pattern of manifestation against the tasks which impose relatively lesser load on linguistic tasks (strop or non-zero task, etc).

Aim: To study selective attention ability in alcoholics by employing non-zero and lexical decision task.

METHOD

Participants: A total of 40 participants in the age range of 45–55 years were recruited for the study. These participants were grouped into 2 subgroups. Group 1 participants (n=20) had history of alcoholism (from >15 years) and were continuing to consume alcohol while group 2 participants (n=20) were non-alcoholics (neither they consumed alcohol at present nor they had history of consumption in the past). Participants in group 1 were categorized as moderate alcoholics based on DSMV criterion for alcohol use and reported of general slowing off late. The DSMV criterion presents 11 symptoms pertaining to alcohol use. If 2 or 3 symptoms persist, a person is called as mild alcoholic, if 4 or 5 symptoms persist a person is called as moderate alcoholic and a person is called severe alcoholic if 6 more symptoms persist. The non-zero task and lexical decision task was administered on all the participants. The

stimulus for both these tasks was presented through DMDX auto mode 5.0.

The stimulus for non-zero task was random 4 digit numbers (60 trials), half of trails were accompanied with '0' and half of it was not accompanied with 0. The task required the participants to press the left arrow key on the key board for the trails comprising 0 and to not respond to trails which do not consist 0. The stimulus for lexical decision task comprised of words and non-words in Kannada. Non-words were formed by transposing the sound segments. Word to non-word ratio was 50:50. The task of the participants was to press left arrow to indicate non-words and the participants were asked to ignore the trails comprising of words.

RESULTS AND DISCUSSION

The mean reaction time and accuracy of responses for non-zero task and lexical decision task were computed for group 1 and group 2 participants. On non-zero task, group 1 participants obtained a mean reaction time of 1665.34 milliseconds while group 2 participants secured a reaction time of 1451.77 milliseconds (Figure 1). The accuracy scores for the two groups were 86% and 89% respectively.

The reaction time for group 1 participants on lexical decision task was 1998.22 milliseconds while the reaction time for the group 2 participants was 1496.22 milliseconds (Figure 2). The accuracy scores for two groups were 81% and 92% respectively. Reaction time was more and accuracy was poorer for the alcoholic group (group 1).

Further, in order to verify if there was any significant on mean reaction time, independent sample T test was carried the F score was 4.18 and corresponding p value ($p < 0.05$) showed no significant difference. For the lexical decision task, the mean reaction time for group 1 and group 2 participants were 2011.68 and 1455.38 milliseconds respectively. While the accuracy scores for group 1 and group 2 were 80% and 89%. Statistical difference was verified by employing Mann Whitney U test (as the data was skewed). The Z score obtained was 5.16 and corresponding p value ($p < 0.05$) showed significant difference.

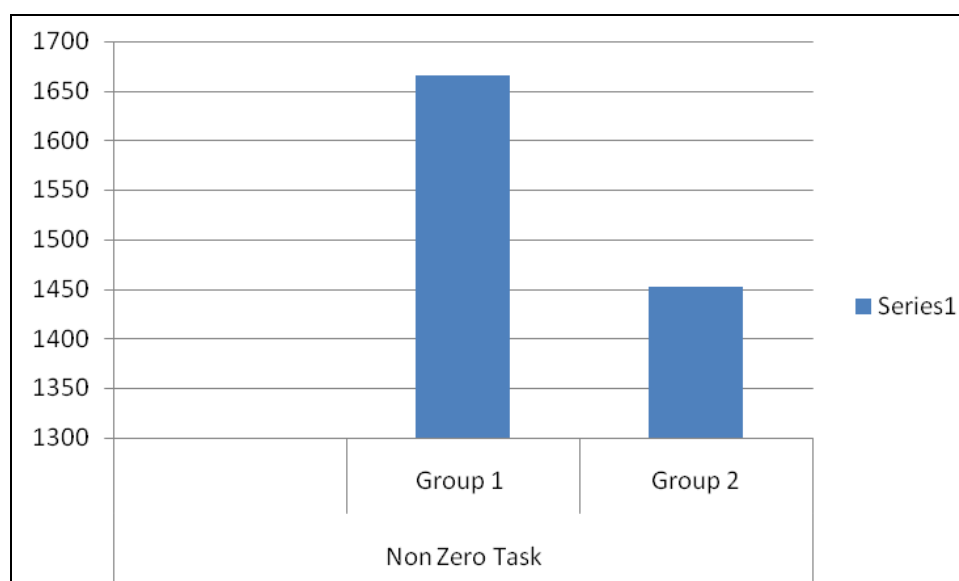


Fig. 1: Mean Reaction Time for Non-zero Task.

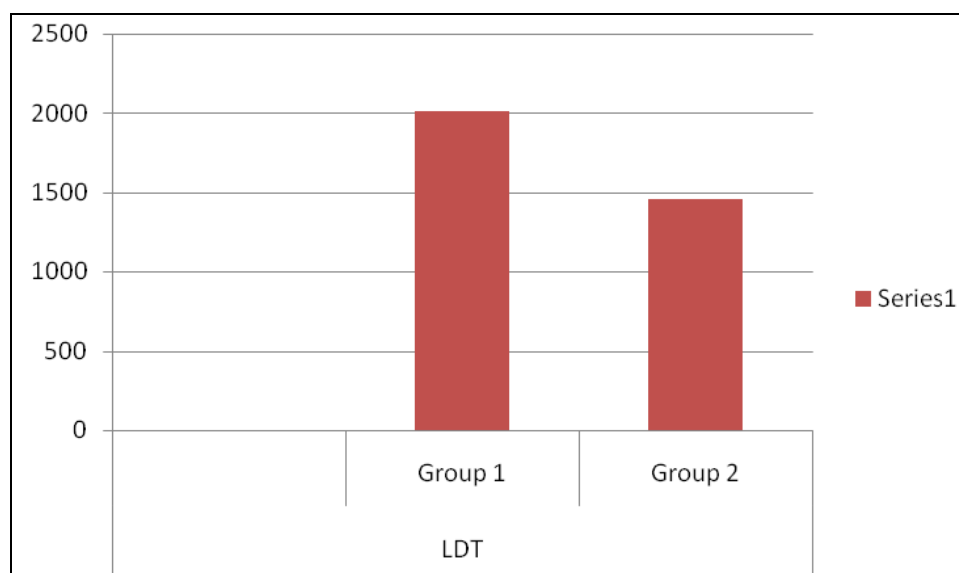


Fig. 2: Mean Reaction Time for Lexical Decision Task.

In summary, there was statistical significant difference between alcoholics and non-alcoholics on the lexical decision task only, the difference in the performance between alcoholics and non-alcoholics on non-zero task was statistically non-significant. Through studies it has been proved that there would be a decline in attention abilities of alcoholics, the present study aimed to test if there would be decline in selective attention by employing task with little or no linguistic load (non-zero task) and task with linguistic load (lexical decision task), the lexical decision task was more sensitive in identifying the processing lag in alcoholics.

CONCLUSIONS

Selective attention tasks would demand the participants to pay attention to the desired stimulus by ignoring the distractor stimuli. Participants in group 1 were moderate alcoholics who reported of slowing informally selective attention in alcoholics (group 1) and non-alcoholics (group 2) were tested through two tasks non-zero task (with no linguistic load) and lexical decision task (with linguistic load). The mean reaction time and accuracy of performance on the two tasks were considered. Non-alcoholics performed better than the alcoholic participants on both the tasks, however statistically significant difference was

seen only for LDT indicating that the task was a better indicator of decline in alcoholics.

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