LETTER TO EDITOR

EFFECT OF COLOUR AND GENDER ON HUMAN REACTION TIME

(Received on December 16, 2010)

Sir,

Reaction time measurement is an indirect index of processing capability of central nervous system and simple means of determining sensory motor association and performance of an individual (1). Reaction time has physiological significance and is a simple and non-invasive test for peripheral as well as central neural structures (2). Reaction time is crucial for our everyday lives and requires intact sensory skills, cognitive processing and motor performance. It determines the alertness of a person because how quickly a person responds to a stimulus depends on his reaction time and therefore it must be lesser in certain occupation e.g. Drivers, sportsmen, pilots, military people, doctors, nursing staff, security guards. Various factors influencing human reaction time are age, left or right hand, direct (central) versus peripheral vision, practice, fatigue, fasting, breathing cycle, personality types, exercise, and intelligence of the subject. Out of these various factors, in this study we had studied the time taken between application of visual stimulus and response obtained and comparison of the response in male and female volunteer. The human reaction time measurement had been made from the volunteers subjected to visual stimulus.

Students between 17-25 yrs had been included in this study on the basis of physical examination. Proper consent of volunteer student had been obtained before the procedure. Students having normal acuity of vision as tested by Snellen’s test type and Jaeger’s test type. Students having normal color perception as tested by Ischihara’s chart. Students having no neural diseases and students having no muscle diseases had been taken. Study had been carried out on the Medical student of tertiary health centre of Municipal Corporation of Greater Mumbai. 125 Male and 125 Female Medical students fulfilling inclusion criteria had been included. The apparatus used in this study is ‘Research Reaction Time apparatus’ Manufactured by Anand Agencies, Pune-2. Each individual had been explained about the test and sufficient trials had been given for proper understanding. All the subjects had been subjected to the tests in the secluded/quiet room. Before measuring the visual human reaction time, each subject had been asked to identify the flashing of red and green light. Subject had been instructed to press the response button by the Rt. Index finger already on it to stop the clock as soon as he/she will see the red/green light. From digital display, reaction time had been noted. Three readings of each stimulus taken and their respective average calculated.

A comparison had been made between:
1. Visual human reaction time to red light and green light stimulus in males and females separate.
2. Visual human reaction time to red light and green light stimulus between males and females.

To test whether there was any significant difference in between males and females with reference to the study variables between the study groups, paired ‘t’ and unpaired ‘t’ test was used at appropriate places as a statistical test. The P value <0.05 was considered significant.
external stimulus and is an indirect index of processing capability of central nervous system and sensory motor association.

Green color evoked a faster response due to its stronger stimulation on the visual receptor than for red color in both male and female subjects (5). The corpuscular theory of light, proposed by Max Plank explains the relationship between the wavelength and the energy carried by different colored lights. It indicates that one quantum of red light has the maximum wavelength and hence carries the least energy. The green light of same quantum has shorter wavelength and carries greater energy than red light. The greater energy carried by green light could be an important factor in stimulating the visual receptors faster, when compared to red light, producing a shorter response time (5). The maximum sensitivity of scotopic vision is approximately 500 nm i.e. for bluish – green light. This shows that red color (650-750 nm) is not at all sensitive to dim light. Thus in dim light, if blue and red colors need to be compared, blue can be made out easily.

Likewise maximum sensitivity of photopic vision is about 560 nm i.e., for greenish – yellow light.

Thus, in conclusion, human reaction time in females is more as compared to males and reaction time to red light stimuli is more as compared to green light stimuli in both sexes.

SHRIKRISHNA N. BAMNE*, AMEET D. FADIA AND AVANTIKA V. JADHAV
Department of Physiology,
Index Medical College Hospital & Research Centre,
Post Bhavlia Khurd, Nemawar Road, Indore – 452 016 (M.P.)
and Seth G.S. Medical College & K.E.M. Hospital Parel, Mumbai – 400 012

REFERENCES

*Corresponding Author : E-mail: shrikrishna_bamne@rediffmail.com; Mobile No.: 09752532088