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Psycho-socio factors affecting over reaction time

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Abstract

The purpose of the study to assess the factors determinants to reaction ability of sports persons. A player's ability to respond quickly, properly, and precisely to the information being sent is of utmost importance in determining success in the chosen sport. It has been a favorite subject of experimental psychologists since and middle of the nineteenth century. However, most studies ask questions about the organization of the brain, so the authors spend a lot of time trying to determine of the results conform to some mathematical model of brain activity. A descriptive assessment of research data through journal, books, and internet the study found the conclusion that, there are several factors psychological or physiological, responsible for reaction time ability of the player.

Keywords: Reaction time, response, sports psychology, visual perception

Introduction

Reaction time is one of the important methods used to study a person's central information processing speed and fast coordinated peripheral movement response. It is a good indicator of performance in sports. Reaction time is often overlooked and usually under-estimated element in the preparation process for athletes.

For about 120 years, the accepted figures for mean simple reaction times for college-age individuals have been about 190 ms (0.19 sec) for light stimuli and about 160 ms for sound stimuli (Galton, 1899; Welford, 1980; Brebner and Welford, 1980) ^[11, 12, 13].

Reaction Time

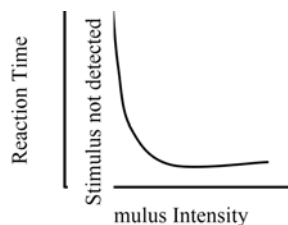
Psychologists have named three basic kinds of reaction time experiments (Luce, 1986; Welford, 1980) ^[14, 12].

In simple reaction time experiments, there is only one stimulus and one response. 'X' at a known location', 'spot the dot', and reaction to sound all measure simple reaction time.

In recognition reaction time experiments, there are some stimuli that should be responded to (the 'memory set') and others that should get no response (the 'distracter set'). There is still only one correct response. 'Symbol recognition' and 'tone recognition' are both recognition experiments.

In choice reaction time experiments, the user must give a response that corresponds to the stimulus, such as pressing a key corresponding to a letter if the letter appears on the screen. The reaction time program does not use this type of experiment because the response is always pressing the spacebar. Froeberg (1907) ^[15] found that visual stimuli that are longer in duration elicit faster reaction times, and wells (1913) ^[16] got the same result for auditory stimuli.

Piéron (1920) and Luce (1986) ^[17, 14] reported that the weaker the stimulus (such as a very faint light) is, the longer the reaction time is. However, after the stimulus gets to certain strength, reaction time becomes constant. In other words, the relationship is:



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Hsieh *et al.* (2007) ^[18] found that simulated vibration of a computer monitor increased reaction times to stimuli presented on the monitor, worsened error rates, and caused more visual fatigue.

Psycho-Socio Factors Affecting Over Reaction Time

Arousal: One of the most investigated factors affecting reaction time is 'arousal' or state of attention, including muscular tension. Reaction time is fastest with an intermediate level of arousal, and deteriorates when the subject is either too relaxed or too tense (Welford, 1980; Broadbent, 1971; Freeman, 1933) ^[12, 19, 20].

Age: Simple reaction time shortens from infancy into the late 20s, then increases slowly until the 50s and 60s and then lengthens faster as the person gets into his 70s and beyond (Welford, 1977;) Jevaa and Yan, 2001; Luchies *et al.*, 2002; Rose *et al.*, 2002; Der and Deary, 2006). ^[21, 22, 23, 24, 25] also reported that this age effect was more marked for complex. Reaction time tasks. Reaction time also becomes more variable with age (Gorus *et al.*, 2008). ^[26]

Gender

In almost every age group, males have faster reaction times than females, and female disadvantage is not reduced by practice (Noble *et al.* 1964; Welford, 1980; Adam *et al.* 1999, Dane and Erzurumlugoglu, 2003; Dr and Deary, 2006) ^[27, 12, 28, 8, 9]. The last study is remarkable because it included over 7400 subjects. Bellis (1933) ^[29] reported that mean time to press a key in response to a light was 220 msec for males and 260 msec for females; for sound the difference as 190 msec (males) to 200 msec (females.)

The Hemispheres

Of the cerebrum are specialized for different tasks. The left hemisphere is regarded as the verbal and logical brain, and the right hemisphere is thought to govern creativity, spatial relations, face recognition, and emotions, among other things. Also, the right hemisphere controls the left hand, and the left hemisphere controls the right hand. This has made researchers think that the left hand should be faster at reaction times involving spatial relationships (such as pointing at a target.)

Direct vs Peripheral Vision

Literature that shows that visual stimuli perceived by different portions of the eye produce different reaction times. Brebner and Welford (1980) ^[13]. The fastest reaction time comes when a stimulus is seen by the cones (When the person is looking right at the stimulus.) if the stimulus is picked up by rods (around the edge of the eye) the reaction is slower.

Practice and Errors

When subjects are new to a reaction time task, their reaction times are less consistent than when they've had an adequate amount of practice Sanders (1998, P. 21)

Fatigue

Reaction time gets slower when the subject is fatigued Welford (1968m 1980. Singleton (1953) observed that this deterioration due to fatigue is more marked when the reaction time task is complicated than when it is simple. Mental fatigue, especially sleepiness, has the greatest effect. Philip *et al.* (2004) ^[30] found that 24 hours of sleep deprivation lengthened the reaction times of 20-25 year old subjects, but had no effect on the reaction times of 52-63 year old subjects.

Fasting

Three days without food does not decrease reaction time, although it does impair capacity to do work (Gutierrez *et al.*, 2001) ^[31]. These results were confirmed by Cheatham *et al.* (2009) found that six months of calorie limited diets with either high and low carbohydrates did not affect reaction time or any other cognitive measure. Diets high in carbohydrates did result in depressed mood.

Distraction

Trimmel and poelzl (2006) ^[32] found that background noise lengthened reaction time by inhibiting parts of the cerebral cortex. Richard *et al.* (2002) ^[33] and lee *et al.* (2001) ^[34] found that college student given a simulated driving task had longer reaction times when given a simultaneous auditory task. They drew conclusions about the safety effects of driving while using a cellular phone or voice – based e-mail.

Warnings of Impending stimuli

Reaction times are faster when the subjects has been warned that a stimulus will arrive soon, brebner and Welford (1980) ^[13]. In the Reaction time program, the delay is never more than about 3 sec, but these authors report that even giving 5 minutes of warning helps. This effect probably occurs because attention and muscular tension cannot be maintained at a high level for more than a few seconds (Gottsdanker, 1975) ^[35].

Alcohol

Moskowitz and Fiorentino (2000) ^[36] review the impairing effects of alcohol on reaction on reaction time. Kruisselbrink *et al.* (2006) ^[37] found that adult females who drank from one to six cans of beer did not suffer delayed reaction times the next morning, although they made more errors on a choice reaction time task. Hernandez *et al* (2007) ^[38] found that the slowing of reaction time by alcohol was due to a slowing of muscle activation, not muscle action

Breathing Cycle

Buchsbaum and Calloway (1965) ^[39] found that reaction time was faster when the stimulus occurred during expiration than during inspiration -.

Personality Type

Brebner (1980) ^[13] found that extroverted personality types had faster reaction times, and Welford (1980) ^[12] and Nettelbeck (1973) ^[40] said that anxious personality types had faster reaction times. Robinson and Tamir (2005) ^[41] found that neurotic college students had more variable reaction times than their more stable peers.

Exercise

Exercise can affect reaction time. Welford (1980) ^[12] found that physically fit subjects had faster reaction times, and both Levitt and Gutin (1971) ^[42] and Sjoberg (1975) ^[43] showed that subjects to produce a heart rate of 115 beats per minute. Kashiara and Nakahara (2005) ^[44] found that vigorous exercise did improve choice reaction time, but only for the first 8 minutes after exercise. Nakamoto and Mori (2008) ^[45] found that college student who played basketball and baseball had faster reaction times than sedentary student. At least for baseball, the more sports experience the students had, the faster their reaction times were to baseball- specific stimuli

Punishment, Stress and Threats

Shocking a subject when he reacts slowly does shorten reaction time (Johanson, 1922; Weiss, 1965) ^[46, 47]. Simply

making the subject feel anxious about his performance has the same effect, at least on simple reaction time tasks (Panayiotou, 2004) [48]. Mogg *et al.* (2008) [49] found that it might be hard to disentangle the effects of threat-induced anxiety from the simple distraction that the threat was causing. In other words, even a non-threatening stimulus can cause distraction and slow reaction time, but not by causing anxiety.

Stimulant Drugs

Caffeine has often studied in connection with reaction time. Lorist and Snel (1997) [50] found that moderate doses of caffeine decreased the time it took subjects to find a target stimulus and to prepare a response for a complex reaction time task. Durlach *et al.* (2002) [51] found that the amount of caffeine in one cup of coffee did reduce reaction time and increase ability to resist distraction, and did so within minutes after consumption.

Learning Disorders

Miller and Poll (2009) [52] found that college students with a history of language and / or reading difficulties had slower reaction times. Within the affected group of students, better language skills were associated with faster reaction times.

Illness

Minor upper respiratory tract infections slow reaction time make mood more negative and cause disturbance of sleep (Smith *et al.* 2004.)

Conclusions

Study article found the conclusion that, there are several factors eighter psychological or physiological, responsible for reaction time ability of a player.

The training program me for the players should include auditory time. Training.

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