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Motion required Reaction time of the Labrador Retriever (Domestic Dog Breed) is faster than Humans

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ABSTRACT

The reaction time of dog is faster as compared to other animals. A Dog can detect stimulus of 1 diopter visually while humans can detect about 10-20 diopters. A Labrador dog was trained in backyard of a house in Florida, USA in such a way that he had to jump along with human right after seeing the stimulus i.e. eruption of water from the fountain. Data was recorded in a video recorder, later on it video was processed in a software. The dog was provided with stimulus at different intervals of time. Human kids were also included for comparative analysis of this study. 8 trials of stimulus were shown to both dog and kids.An average reaction time (in relation to 25frame per second) of dog in all of the jumps was found 2.5 frames of appearance of the stimulus while in case of human kids it was 7.62 frames. As a result, the dog was found 5.12 frames faster than human kids. This study reveals that Reaction time of the domestic Labrador Retriever dog is faster than humans. It can detect and respond to any visual stimulus much faster than humans. Moreover, coordination of visual and auditory is well evolved as compared to human.

Key Words:*Dog, Human Response Time*

INTRODUCTION

Reaction time is a period of time in which an organism perceives a stimulus and produce a behavioral response [1].There are so many types of reaction time, but one of the basic and important one is motion required simple reaction time. In which an organism show response to any movement in an environment [2,3]. Reaction time of dog is faster as compared to other animals. A Dog can detect stimulus of 1 diopter visually while humans can detect about 10-20 diopters [4]. *Canis lupus familiaris* commonly called Domestic dog belongs to family Canidae and genus Canis [5]. Origin of Domestic dog is not well studied, a very little amount of data regarding its origin is there. Some genomics studies indicate that *Canis lupus familiaris* is originated from the extinct Taymyr wolf and gray wolf [6]. *Labrador* is also called Labrador Retriever [7]. It is the most common dog breed in UK and USA [8,9] these dogs are mostly trained as companions to help blind people or people with any disability [8].

MATERIALS AND METHODS

A *labrador*dog was trained in backyard of a house in Florida, USA in such a way that he had to jump along with human right after seeing the stimulus i.e. eruption of water from the fountain. Eruption / Release of water was controlled up to only one second (Figure-1A/B).

Stimulus	Eruption of water from Fountain
Response	Jumping

Data was recorded in a video recorder, later on it video was processed in a software (Ulead Video Studio Version.11) to check the reaction time of dog as well as human kids. Ulead Video Studio Version.11 was designed to record and show video at 25 frames per seconds. That is why data was processed in 25 frame per second operating system.

RESULTS

In this experiment when water was erupted from the fountain for the very first time, dog responded and jumped within the 1st frame of a second while kids jumped at 6th frame of a second, Human kids even didn't show any response at 5th frame of a second.resulted reaction time of dog was 5 frames faster than humans. Figure-2 Shows 5th frame of stimulus (Water eruption) where dog is showing response for the water fountain, while three kids even didn't detect that stimulus at 5th frame and are ready to respond. On 6th frame they detected the water eruption and jumped in response.In step dog jumped at 2nd frame right after right after detection of stimulus while human kids detected the stimulus at 7th frame of water eruption. This time again reaction time of dog was 5 frames quicker than human kids. 3rd jump was same to the 2ndone but surprisingly one of the kid responded just equally to the dog, response time of both the dog and one of the kid was 2nd frame of appearing of the stimulus. In fact, kid responded before observing the stimulus and at the same time stimulus appeared. That is why he responded at the same time of dog. Figure-2 is showing the response of dog and a kid t a same time.In fourth jump the dog responded at 5th frame of a second while kids responded at 6th frame of a second, reaction time of dog was 1 frame quicker than human kids.In fifth jump the dog showed the quickest response in relation to human kids i.e. he responded at 5th frame of appearance of the stimulus (water eruption) while kids responded at 9th frame. Reaction time of dog was 8 frame faster than human kids. Figure-4 shows the reaction of dog at 8th frame where is at top position of its reaction time while kids even didn't detect the eruption of water. In 6th jump dog responded at 4th frame of stimulus while ids responded at 9th frame. Dog was again 5 frame faster. In 7th jump dog showed response at 2nd frame while kids responded at 9th frame. Dog was 7 frames faster than kids. In last jump dog responded at 3rd frame of appearance of stimulus while kids showed response at 8th frame as a result dog was 5 frames faster than human kids (Table-1) (Graph-1).

Figure 1 A

Figure-1 B

Figure-2

Figure-3

Figure-4

Table -1:Reaction time and difference between Dog and Human

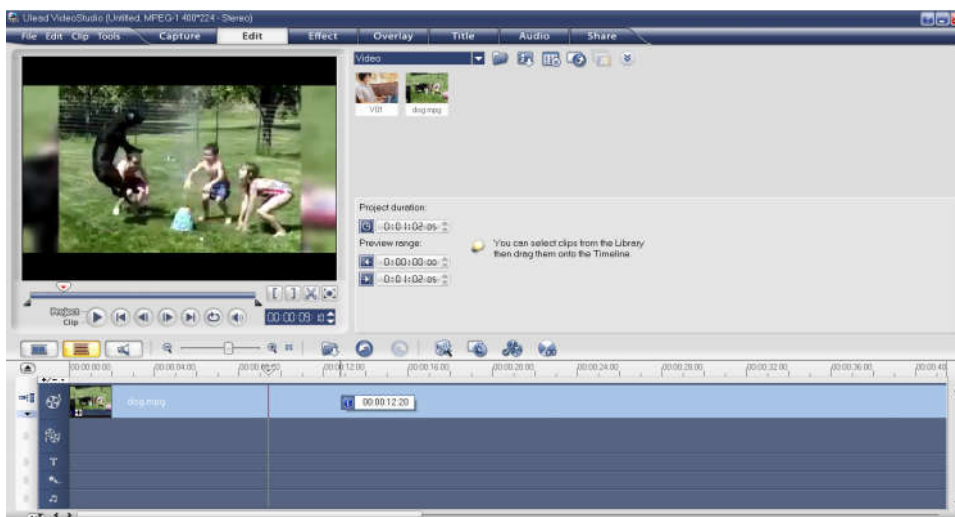| Jumps	Jump of Dog (n frame of appearance of the stimulus)	Jump of Human (n frame of appearance of the stimulus)	Difference (n/25 frame of a second)
1st	1	6	5
2nd	2	7	5
3rd	2	7	5
4th	5	6	1
5th	1	9	8
6th	4	9	5
7th	2	9	7
8th	3	8	5
Average	**2.5**	**7.62**	**5.12**

Figure-5 interface of Ulead video studio Version.11Figure-1 A

An average reaction time (in relation to 25frame per second) of dog in all of the jumps was found 2.5 frames of appearance of the stimulus while in case of human kids it was 7.62 frames. As a result, dog was found 5.12 frames faster than human kids (Graph-2).

CONCLUSIONS AND DISCUSSIONS
This study reveals that Reaction time of domestic Labrador Retriever dog is faster than humans. It can detect and respond to any visual stimulus much faster than humans. More over coordination of visual and auditory is well evolved as compared to human. This study was in agreement with the study of Mech 2006 who concluded that dogs can detect any stimulus much faster than humans i.e. 1 diopters.
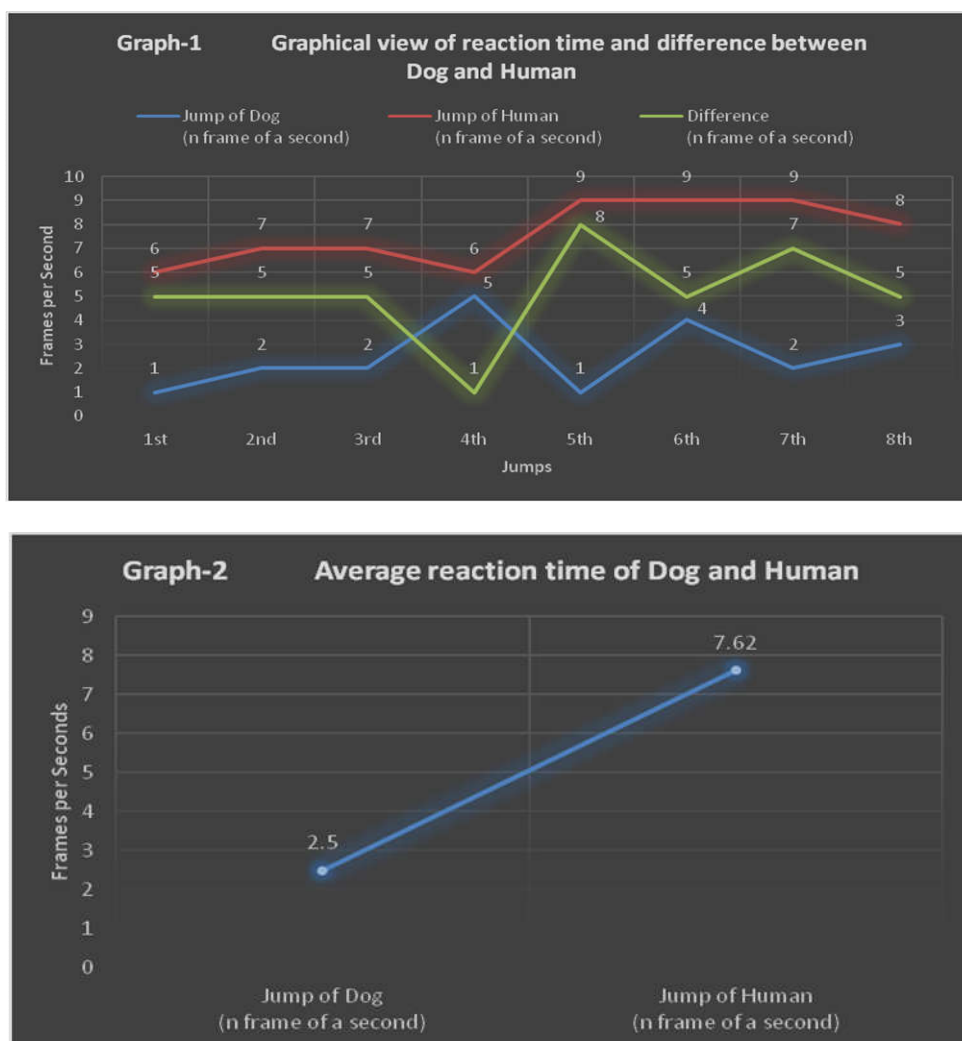
Figure-2 shows software interface identifying time frames and extracting images from video clip.

REFERENCES

1. Jensen, A. R. (2006). Clocking the mind: Mental chronometry and individual differences. Amsterdam: Elsevier. (ISBN 978-0-08-044939-5)
2. Kosinski, R. J. (2008). A literature review on reaction time, Clemson University.
3. Taoka, George T. (March 1989). "Brake Reaction Times of Unalerted Drivers" (PDF). ITE Journal. 59 (3): 19–21.
4. Mech, David. Wolves, Behavior, Ecology, and Conservation. The University of Chicago Press, 2006, p. 98.
5. Wang, Xiaoming; Tedford, Richard H.; Dogs: Their Fossil Relatives and Evolutionary History. New York: Columbia University Press, 2008
6. *How well do dogs and other animals hear"*. Retrieved 7 January 2008.
7. Club, American Kennel. "Labrador Retriever History & Training/Temperament"
8. AKC Dog Registration Statistics". Akc.org. April 4, 2012. Archived from the original on May 11, 2012. Retrieved April 9, 2012.
9. Smith, Stephen. (2000). "Most Popular Dog Breeds in America".