Conducting 4 ME Emmacoppock

Aim: To test the effect that distractions can have on the somatic reflex to a stimulus.

independent variable: distractions (random ball throwing to distract, listening to music, eating food)

dependent variable: The reaction time to a stimulus (a ball that is rolled)

controlled variables:
→ The ball that is rolled
→ The box on the head to block peripheral vision
→ distance between the ball roller and ~~line~~, tape line (other person).
→ the area in which the experiment is conducted (back of classroom)
→ The phone used to record the exact reaction time.

prediction: ~~I believe that~~, When ~~a~~ a ball is rolled ~~a~~ from behind, it will take a certain amount of time between where the measurment begins (a line on the ground), until the ball passes the peripheral vision, the person reacts to the stimulus and undergoes a somatic reflex to the stimulus by clapping. However, if distractions are involved, I believe that these will have an impact, by slowing down the reaction time in which the somatic reflex to a stimulus occurs.

Hypothesis: When distractions are present, the reaction time to a stimulus, that causes a somatic response, will be increased by 0.1 seconds.

Equipment: tennis ball (stimulus); phone with music, earphones, 2 soccerballs and a meusli bar (distractions), tape, (tape measuring area) box to block peripheral vision, phone with slow motion capability, ~~a person~~ and a tissue box to lean it against, 2 people.

Method:

1) place a line of tape on the floor, that indicates where the measuring time should start from (and finishes at the clap to the stimulus).
2) put a phone that measures the time on slow motion. Lean it against a tissue box, equal to the tape begin the recording.
3) Have one person stand sideways, equal next to the tape and phone that is recording. Put a box over their head that only has the front open, in order to block peripheral vision.
4) Have the second person stand behind them, at a distance of 3 metres. Get the tennis ball ready.
5) First, with no distractions, roll the ball past the line. When the person sees the ball, they react to it by clapping. Retrieve the ball and repeat twice. more.
6) The person who is reacting to the stimulus now uses their phones (with earphones) to listen to music as a distraction. The ball roller rolls the ball, when the person sees it, they clap. Repeat twice.
7) The person who is reacting to the stimulus now ~~uses their~~ begins to eat ~~banana~~. The ball roller rolls the ball, when ~~they~~ the person sees it, they clap. Repeat twice.
8) The person who is rolling the tennis ball now begins to randomly roll ~~soccer~~ and throw the soccer balls as a distraction. They then roll the tennis ball, and the person claps when they react. Repeat twice.
9) Go and stop the slow motion video, and ~~step~~ determine the amount of time between where the tennis ball passed the line, to where the person clapped. Record all results in a table.

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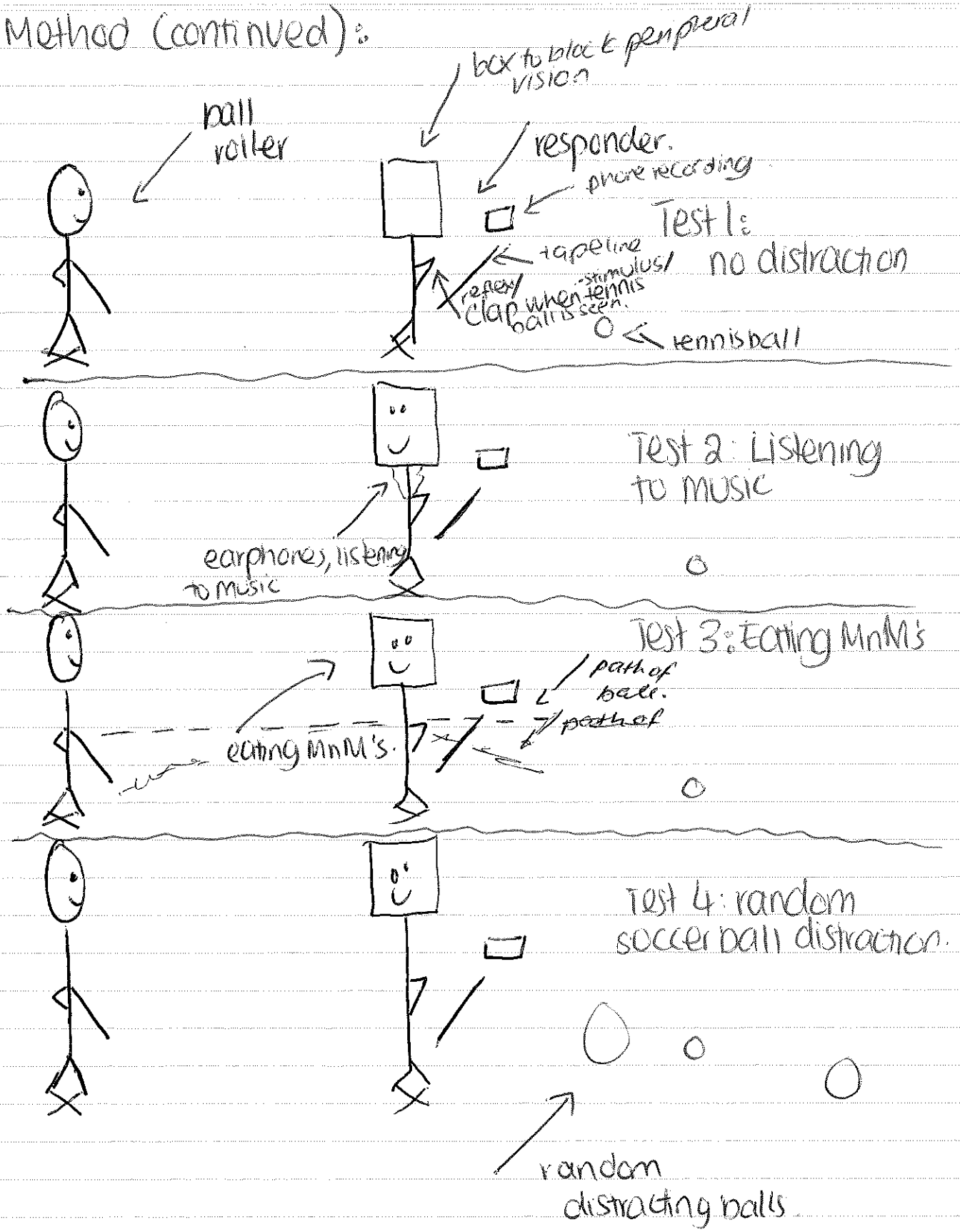
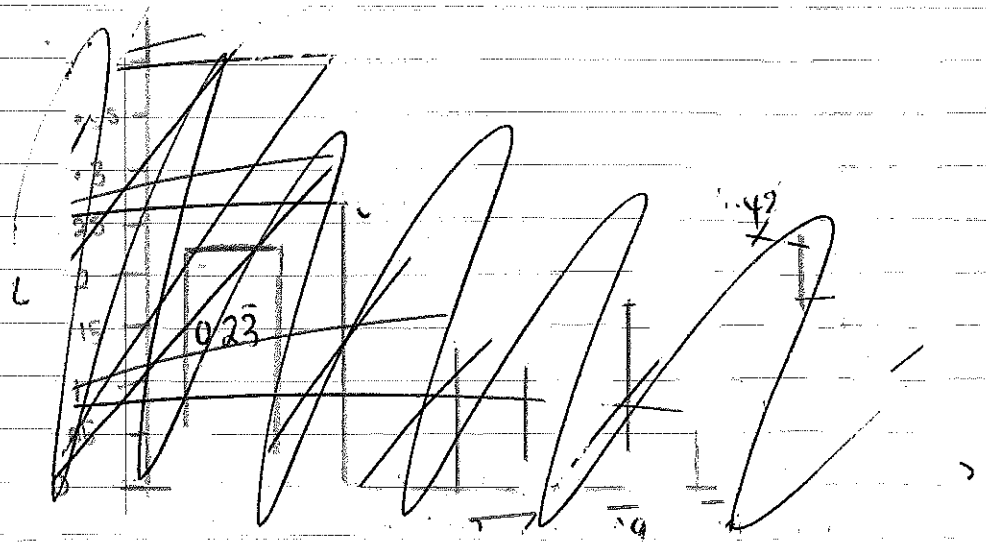
Method (continued):



Results:

Experiment	Trial 1	Trial 2	Trial 3	average
No Distraction	0.2 seconds	0.3 seconds	0.2 seconds	0.2$\overline{3}$
Listening to music	0.4 seconds	0.4 seconds	0.5 seconds	0.4$\overline{3}$
eating	0.4 seconds	0.3 seconds	0.4 seconds	0.3$\overline{6}$
distracting balls	0.5 seconds	0.4 seconds	0.4 seconds	0.4$\overline{3}$



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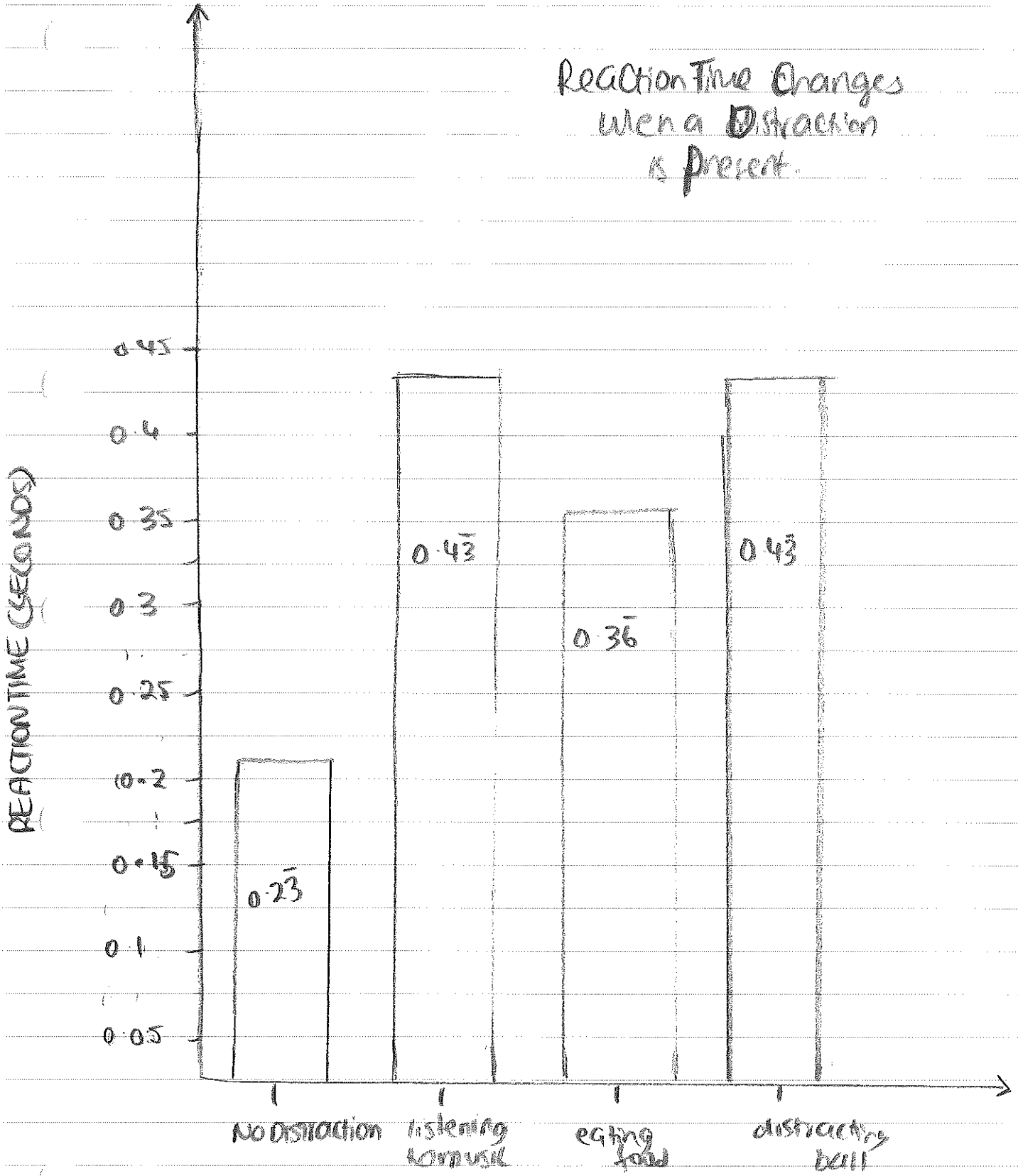
GRAPH.



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Question 1:

Discussion: After completing the experiment, the results obtained partially related to the hypothesis. After completing 3 trials for each variable (no distraction, listening to music, eating food and visual ball distractions), the results were somewhat sound. For the first variable, no distraction, the average response time was 0.23̄ seconds. For the third variable, eating food, the average response time was 0.36̄ seconds. And for the second and fourth variables, the average response time, 0.43̄ seconds, was the same. There is identifiable patterns within our results, which is that, when there is a distraction present, the response time to the stimulus is longer. This can be explained by the basic idea that, when distracted, the body has more information (such as visual and auditory) to process, thus making the response time longer than when it doesn't have much information to process. There did seem to be some inconsistencies in our results. This is that, it was expected that the average response time for variable 2, 3 and 4 would be the same. However, variable 3 was present, which was, 0.07 seconds shorter. This could be explained by an error in calculations, or that could be the actual result. It still supports the hypothesis in the idea that it took longer to respond to the stimulus, due to the distraction.

This experiment can be classified as valid. This classification is supported by the idea that it tested what it was supposed to test (the effect of distractions on response times to a stimulus). It can also be classified as valid, because numerous measures were taken to ensure there was a lack of uncontrolled variables. This can include using controlled variables, such as conducting the experiment in the same area (the classroom), which would minimise uncontrolled variables such as difference in air flow / wind, which could occur if we went outside.

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There ~~did not seem to~~ was difficulties encountered in our experiment that could be improved upon. This includes the speed in which the ball is rolled. This ~~could~~ could have had an impact, as it may have changed how quickly ~~the~~ the response to this stimulus is if the speed of the stimulus keeps changing. One way to improve this could be to use some kind of mechanical machine, such as a tennis ball machine, which would keep the speed constant and increase the reliability. Another difficulty encountered was the malfunctioning of the peripheral vision box. The box on the head kept slipping, meaning the ~~of~~ field of view of the peripheral vision was constantly changing, which means that the stimulus could have been seen in different areas at different times, causing a change in the response time. One way this could be improved is to strap the box onto the head so it is secure and doesn't move, or having a larger box to sit inside, to allow peripheral vision to be blocked in the same area without it moving.

Overall, the results of this experiments are sound, and ~~the~~ the ~~response~~ response time to a stimulus being decreased ~~when~~ when distractions are present, can be reflected by the in class principles and at home research conducted.

A somatic response is a response undergone by skeletal structures due to a stimulus. Once the stimulus is received by the ~~CNS~~ central nervous system (CNS), from sensory (afferent) neurons, it goes through interneurons before finally reaching a motor neuron, which goes to an effector structure where the response is carried out. In terms of ~~the~~ the experiment conducted, the response to a stimulus (the ball rolling) the optic nerve (the sensory neuron) carries the ~~light~~ light message to the occipital lobe, of the brain where the message is sent via interneurons to the frontal lobe. The frontal lobe then decides on a response (the clap), and sends this message, also via interneurons, to the motor cortex. The motor cortex

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then goes to the spinal cord, where the message is now taken, via motor (efferent) neurons, to the effector structure (the hands) and the response (clap) takes place.
This is the response to the 1st variable, no distractions, in our experiment. However, when visual and sensory distractions, such as listening to music, eating food and ~~the~~ distracting balls are present, the response time to the stimulus is slower. This is because the ~~body is~~ ~~now~~ CNS is busy processing distractions, such as visual distractions, and auditory ~~the~~ distractions, which are registered in the cerebrum and cerebellum. Furthermore, when food is being eaten, the body releases ~~the~~ hormones, such as endorphins, due to the satisfaction of the food. ~~All of these factors could~~

All of the distracting factors mentioned above, ~~are~~ have an impact on the response time to a stimulus.

conclusion
Question 2: In conclusion, ~~the~~ our hypothesis has been disproved. ~~The~~ ~~no~~ The results show that, as ~~the response time to a stimulus~~ distractions are present, the response times to a stimulus decreases. However, ~~the~~ the hypothesis says ~~states~~ that distractions will reduce the response time by 0.1 seconds, which has been disproved, as the response time decreases ~~by~~ by between .16 and .2 seconds.

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3) A:

sensory neuron (optic nerve) reacts to seeing ball
↓ reacts to stimulus
interneurons in the ~~eyes~~ Brain (~~optical~~ occipital lobe → frontal lobe → motor cortex) ↓ message
↓ via interneurons. ↓ decision to clap
spinal cord → synapse between afferent/efferent neurons
↓
ventral root ~~synapse~~
(efferent/motor neurons)
↓
effector structure (hands, ~~ed~~ clap).
carries out response

B)

STIMULUS ~~picked~~ detected by receptor, such as pain receptor. such as stepping on ~~coal~~ hot coals
↓
AFFERENT (SENSORY) NEURONS ~~from~~ towards CNS
↓
CNS (SPINAL CORD) dorsal root, synapse in spinal cord, ventral root)
↓
EFFERENT (MOTOR) NEURONS from CNS
↓
EFFECTOR STRUCTURE reflex occurs in foot, steps off coals. ~~before this~~

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C) POINTS OF COMPARISON

- Both the response and reflex arc react to a stimulus, and carry out a response. - after receiving a stimulus
- Both go from a sensory neuron, into the CNS, and to motor neurons and to an effector structure.

POINTS OF CONTRAST

- The reflex arc is involuntary, whereas the response is learned and voluntary.
- The reflex arc doesn't have to go through the Brain, meaning the brain doesn't have to be aware of the response, whereas in the response it does.