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DVSF Research Plan

Background:

Explaining the rationale

You can see many commercials, billboards, and bumper stickers saying don't text and drive but we don't see advertisements saying don't listen to the radio and drive or don't talk on the phone and drive. Why is this, is texting the only thing that can take your mind off the road? In fact, only 20 states ban handheld cell phone use while 48 states ban texting but still permit having a phone conversation while driving. This experiment is being conducted to show how distractions namely reading text, having a phone conversation, or listening to music affects reaction time.

According to the CDC motor vehicle department, it was found that approximately 9 people die and 1,00 people are injured in a distracted driving accident every day.

How Far Do You Drive In Five Seconds?

Five seconds of looking at your phone while driving at 75 MPH or 125 KPH you will have driven the length of the Washington Monument 550 ft or 167 meters

Designing the Test

There are three types of distractions found in everyday life which relate to driving. Visual distractions occur when glancing at a text or navigation system. Manual distractions involve taking hands off the steering wheel for hand-held calling and texting. Cognitive distractions which cause the driver's mind to wander include listening to music, having a phone conversation, and reading text)

Research Question:

Does listening to music, having a phone conversation, or reading text affect your reaction time?

Hypothesis:

I think if 30 participants are given four reaction tests (one while listening to music, one while having a phone conversation, one while reading text and one with no distraction) then the participants' reaction time will **not** change while listening to music but **will be slower** while having a phone conversation and reading text.

Procedures:

1. Using https://faculty.washington.edu reaction time test, the researcher will test each of the thirty participant's reaction time by having them tap on a computer keyboard when the traffic light changes from red to green. The website calculates how long it takes for the participant to react to the changing light. Once the participant taps on the keyboard the test resets and is repeated 4 more times.
2. Each participant will do the test with
   a. with no distraction
   b. while having a phone conversation
   c. while listening to music
   d. while they are reading text

   *These activities will be randomized to get rid of the practice variable, for example, participant 1 will do no distraction first while participant 2 will listen to music first
3. Record the average time it takes the participants to tap the screen for each activity in a chart
4. Lastly, plot the data on a graph

Data Analysis:

- In my experiment, I used 30 participants which is a small number compared to the potential population. If this test was done again the results would slightly vary which is why the standard error is used

- we will never know the population average, of the test being conducted, so standard error states that the population average is within the error bars

The population average is the number you obtain if you have infinite samples,

Data:

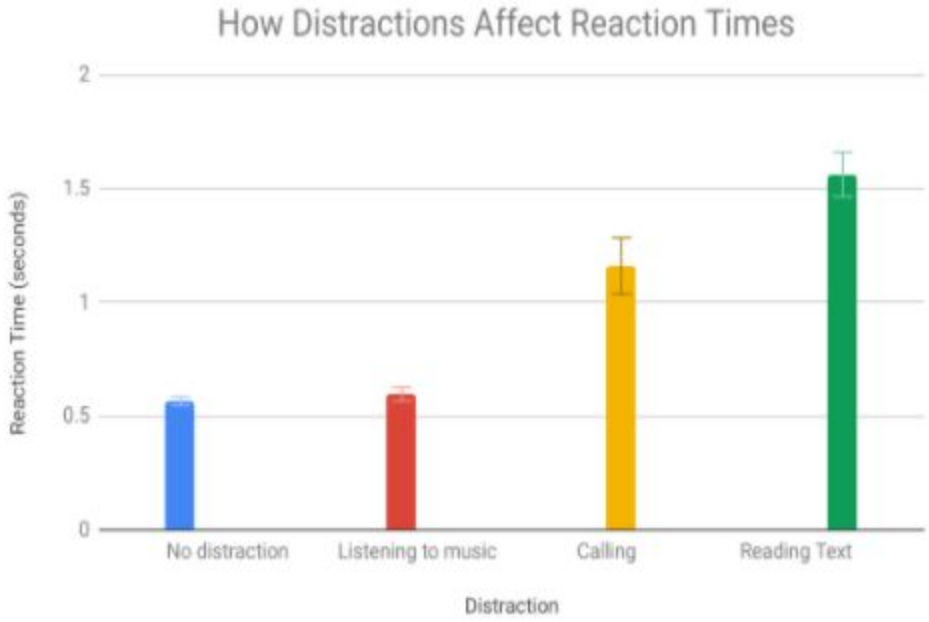
This picture shows the raw data from one of my thirty participants data. I recorded the time it took them to tap the keyboard in the blue column and calculated average and standard error for each participant in the other blocks

	Non-distracted			Radio distraction			Phone Conversation distraction			Reading Text distraction		
Test #	Actual, sec	Average	± Std Error	Actual, sec	Average	± Std Error	Actual, sec	Average	± Std Error	Actual, sec	Average	± Std Error
1	0.52			0.433			0.35			1.106		
2	0.55			0.876			0.463			0.703		
3	0.45	0.526	0.020	0.36	0.5222	0.091	0.698	0.4974	0.057	1.643	1.0204	0.203
4	0.56			0.456			0.455			0.472		
5	0.55			0.486			0.521			1.178		

	Average	average+se	average-se
No distraction	0.566	0.548	0.543
Music	0.527	0.567	0.627
Conversation	1.161	1.039	1.282
Reading Text	1.562	1.465	1.660

Graph:

As you can see the error bars of no distraction **overlap** the error bars of listening to music so we can conclude that listening to music **did not affect** the sample's reaction time but the error bars of no distraction **do not overlap** the error bars of having a phone conversation and reading text, therefore, those distractions **did affect** the reaction time of the participants. Lastly, we can see that if I did not use standard error I would find that listening to music **did affect** reaction time because the bar is larger however when I add standard error it was found that listening to music **did not affect** reaction time because the population or actual average could overlap.



Conclusion

I can conclude with statistical significance that listening to music does not affect reaction time but having a phone conversation and reading text does affect reaction time. My hypothesis was supported in that listening to music will not be distracting but calling and reading the text will be. This chart shows the difference in reaction time between no distraction and distractions. Having a phone conversation slowed the reaction time of the participant by 0.618 seconds and reading text slowed it by 1.006 seconds although this might not seem like a lot but If you are driving 55 MPH or 80 kilometers you could hit a car 80 feet away or 24 meters from you in as little as 1 second if they slam on their breaks.

Difference in Reaction Times

No Distraction (0.566 sec)	
Music (0.527 sec)	0.05 seconds
Conversation (1.161 sec)	0.618 seconds
Reading Text (1.562 sec)	1.006 sec seconds

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