

The Effect of Windshield Size on Gaze Direction

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1. Problem:

People attend to the largest digital screen when exposed to different sized screens. .

2. Goal:

Demonstrate that the size of the screen in a car will affect the amount of time a driver a driver looks at it.

3. Hypothesis:

People will look at other screens in their car, such as speedometer and dashboard controls, more while driving if the windshield is reduced in size

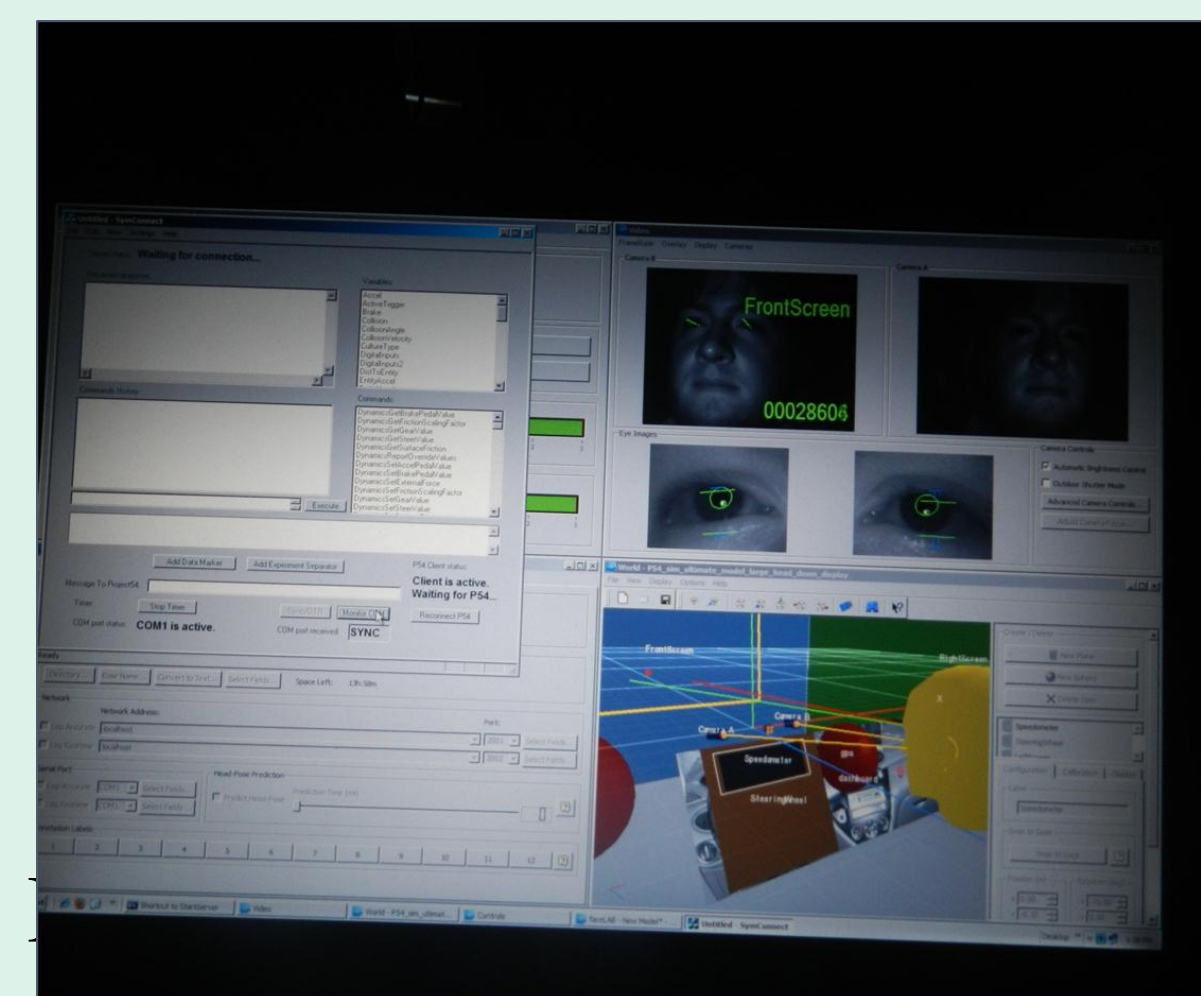
4. Materials



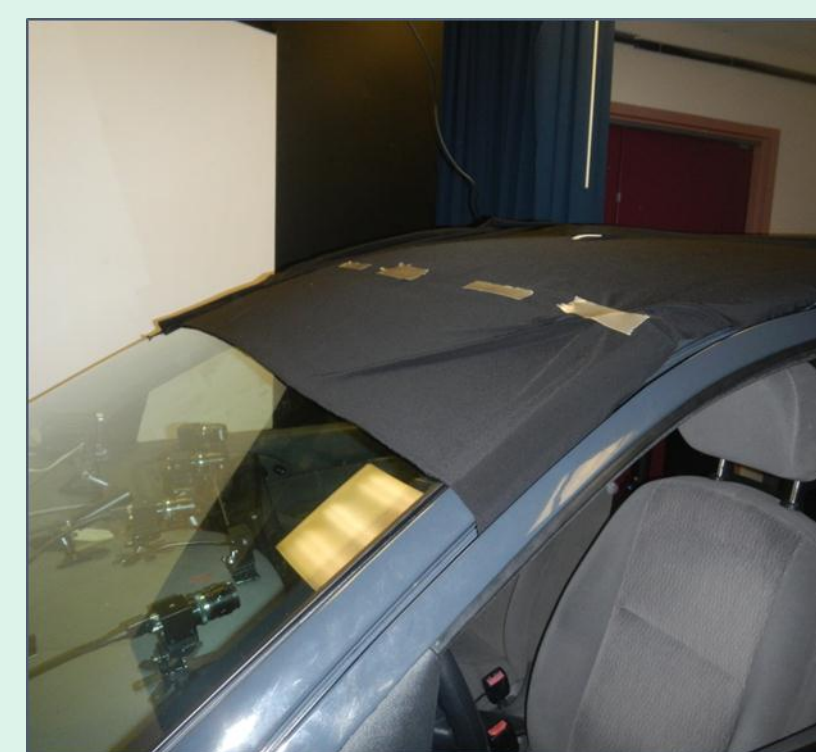
Eye tracker cameras



Car simulator



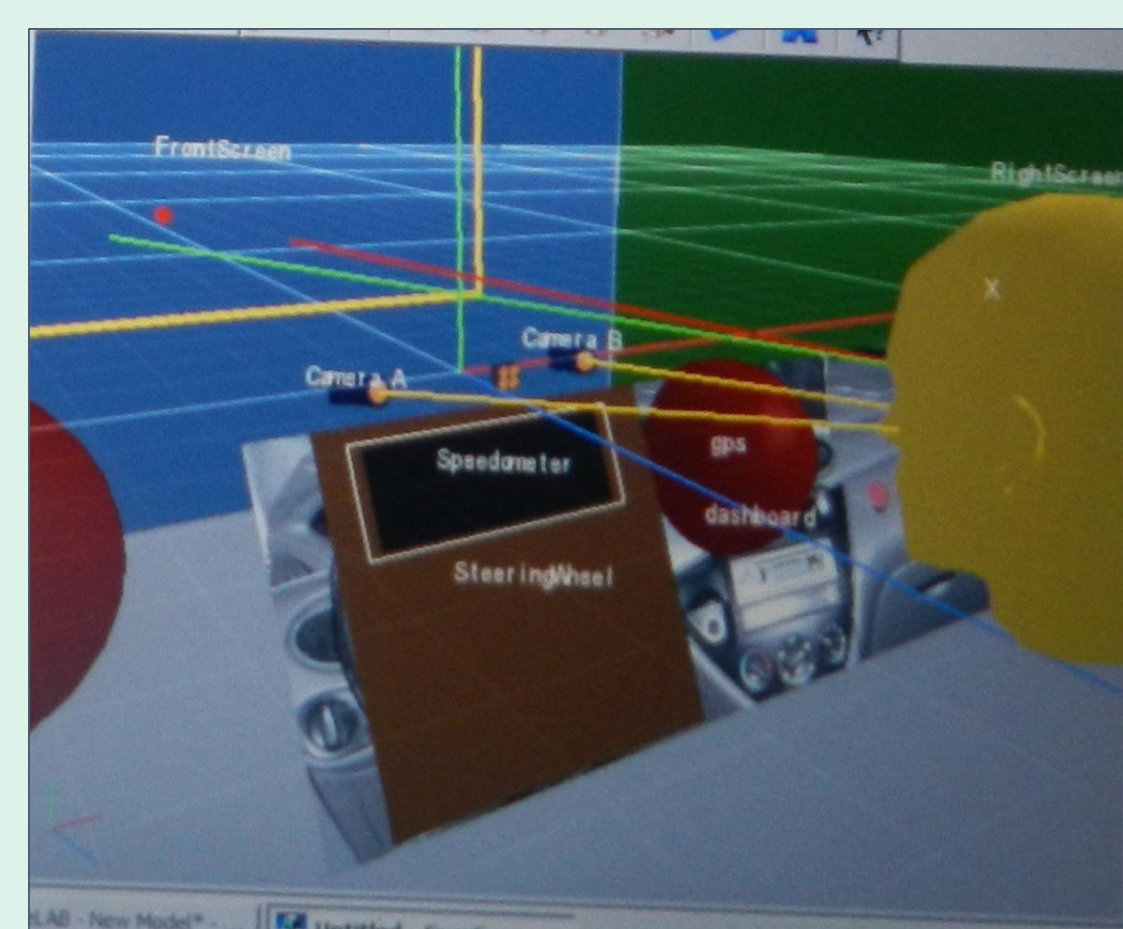
Eye tracker software



Windshield curtain

5. Data Collected

The software tracks eye gaze direction every 1/60 of a second. This data is used to determine the percentage of time spent looking at various screens within the car.

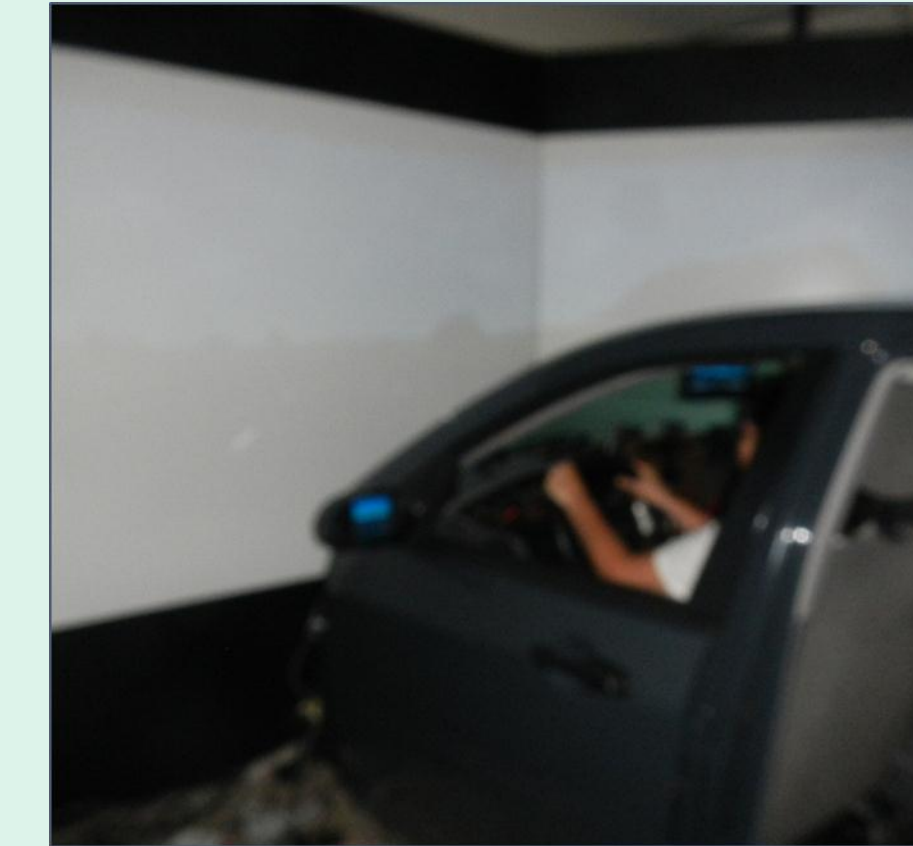


6. Participants

1st experiment – 3 people
2nd experiment – 5 people
3rd experiment – 5 people
Participants ranged from 22 – 62 years old

7. Procedure

First Experiment:
Participant drives the simulator for 5 minutes with a windshield curtain and 5 minutes without a windshield curtain. The driver is asked to follow the car in front of them and to keep their speed at 55mph.



Second Experiment:
Same experiment as number one except that a LCD screen is attached to the console which is playing music using windows media player.



LCD screen playing windows media player



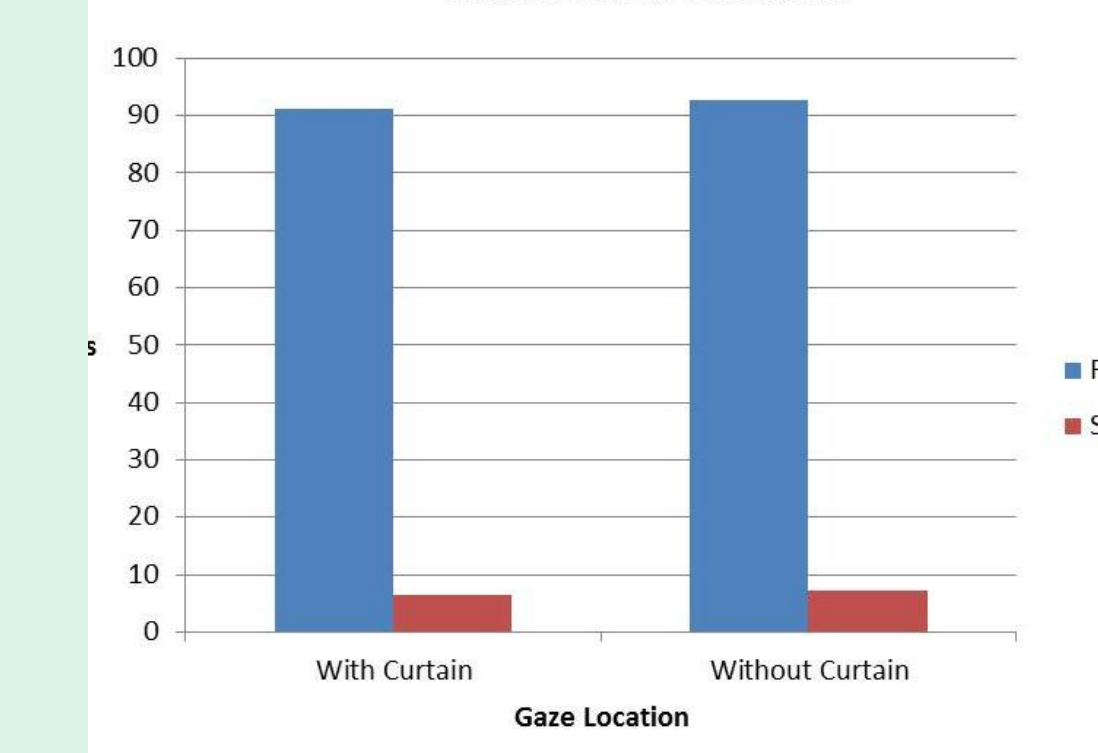
Third Experiment:
Same experiment as number 2 except that the LCD plays video clips of a comedian while the participant is driving. Each video clip is approximately 5 minutes and they are both interviews of the same comedian on the Conan O'Brien show.



Video screen

8. Results

Comparison of Gaze Time Between the Front Screen and the Speedometer With and Without a Curtain

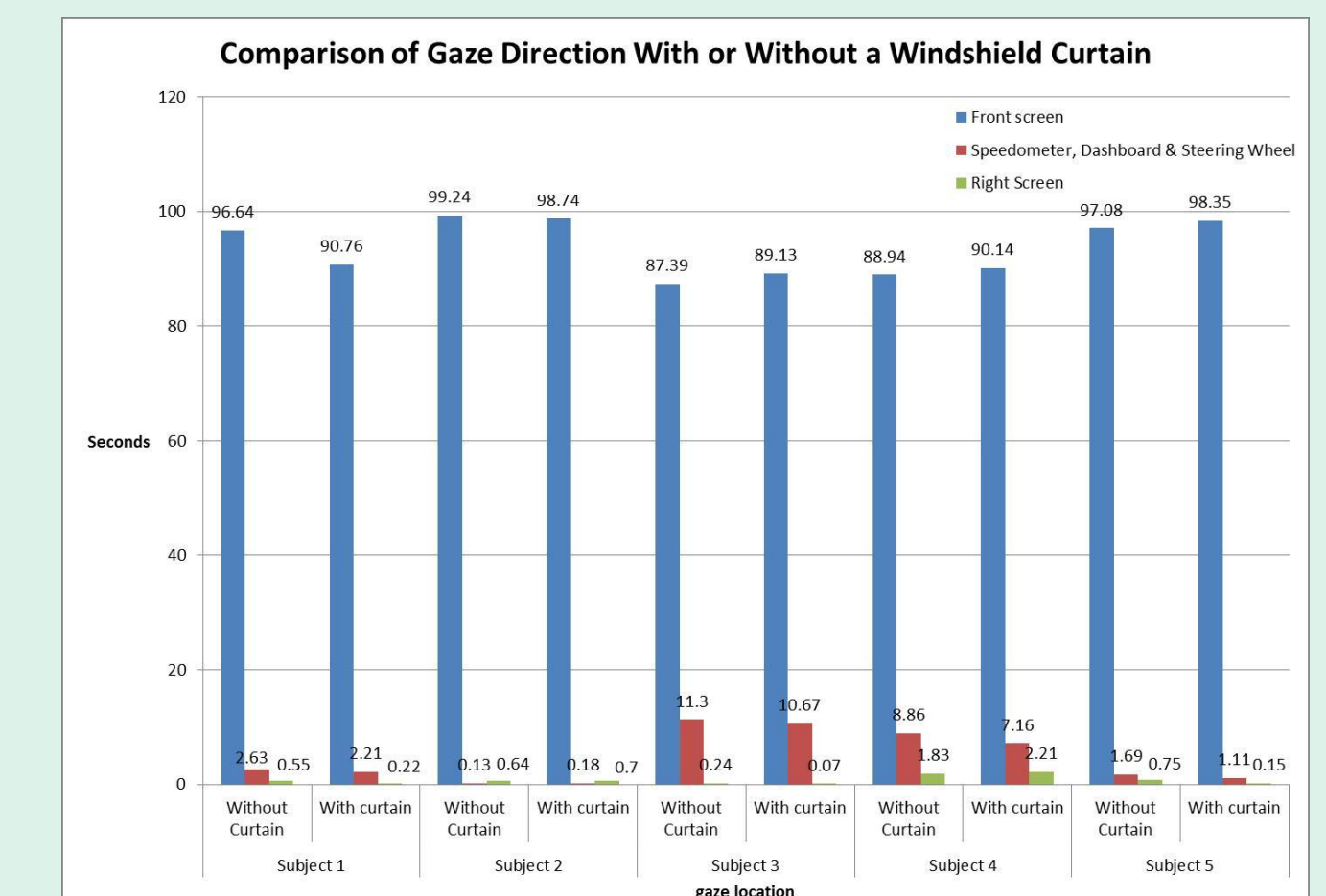


First Experiment

The gaze direction of participants in the first experiment was very similar regardless of whether the windshield curtain was present or not.

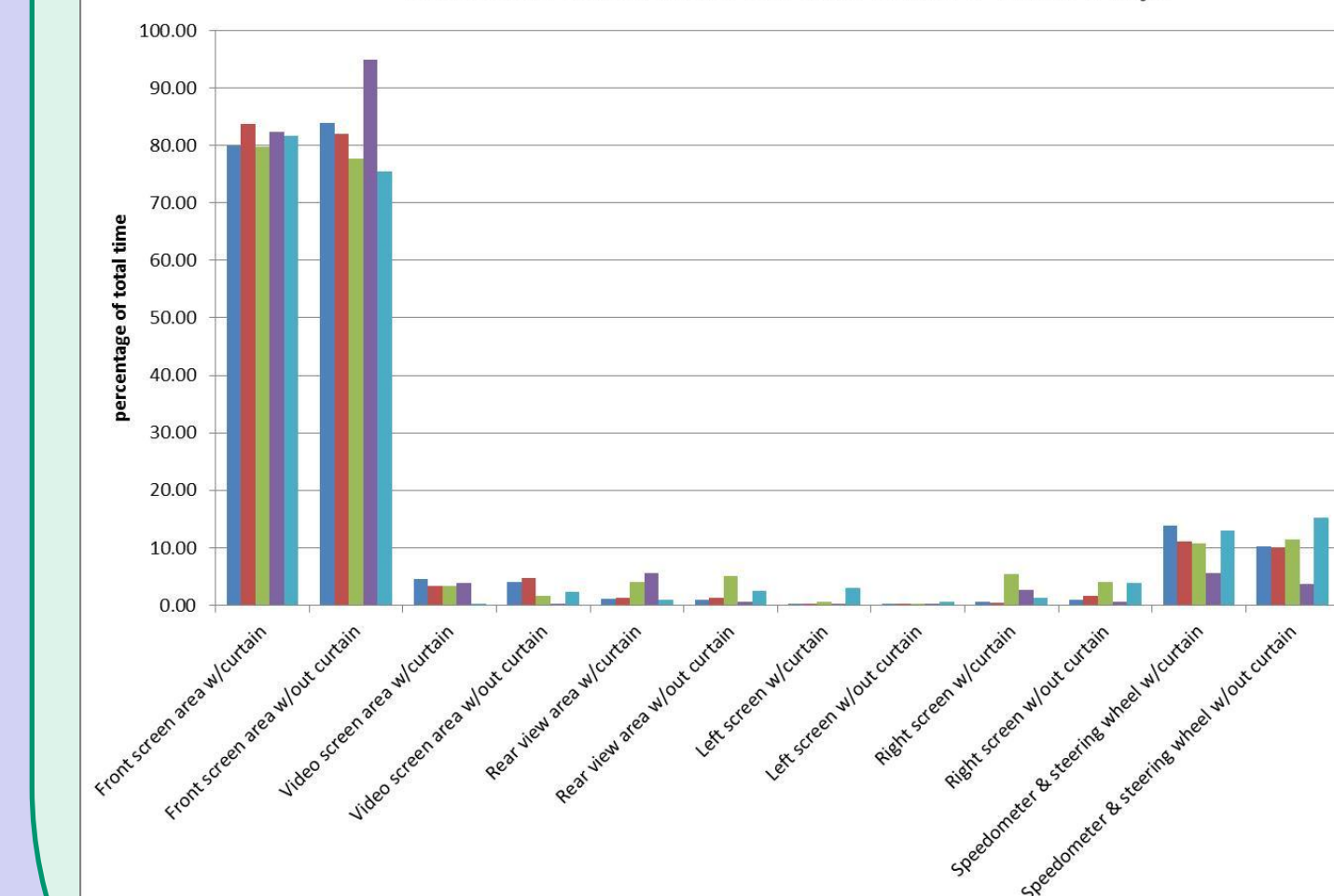
Second Experiment

No clear cut preference is shown through this data. One person looked out the windshield more when there was no curtain, three looked out the windshield with a curtain and one had no difference between a curtained windshield and a windshield without a curtain. Two participants spent less time overall looking out of the windshield.



Third Experiment

Gaze Direction Comparison of Drivers With a Windshield Curtain and Without a Windshield Curtain While a Video Plays



While this experiment demonstrated that drivers can be distracted from paying attention to the road, it did not show a clear difference between whether a windshield curtain was present or not.

9. Conclusion:

The preference to look out a larger screen in a car simulator was not demonstrated in these experiments. However, the sample size was very small and there was a large age difference between subjects. In addition, participants expressed the fact that they knew they shouldn't look at other screens and tried their best to only look out the front screen.

10. Future Work:

Larger sample sizes are needed to make clear determinations of the effect of windshield size on drivers attention. In addition, it would be interested to have large sample sizes which represent various age groups.

11. Acknowledgements:

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