



Distracted Driver: Do Distractions Affect Driving Video Game Scores?

Difficulty

Time Required Short (2-5 days)

Prerequisites None

Material Availability You need access to a gaming system, such as the Nintendo Wii, as well as Mario Kart or another driving game that requires a steering wheel, and a steering wheel for that game; or you can visit a video arcade to play a driving game with a steering wheel.

Cost Low (\$20 - \$50)

Safety No issues

Abstract

Have you ever tried rubbing your stomach and patting your head at the same time? What about doing your homework or studying for your math test while watching television? It is tough to focus on a task when you are distracted doing something else, isn't it? In this science fair project, you will investigate how distractions affect your focus on a task, such as driving, by looking at how gaming scores are affected as you're talking on a cell phone or having a conversation with a friend.

Objective

To determine if distractions, such as talking on your cell phone, affect gaming scores.

Credits

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- Nintendo® is a registered trademark of Nintendo of America Inc.
- Wii™ is a trademark of Nintendo.

Cite This Page

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Introduction

On July 1, 2008 the state of California started to enforce two laws designed to reduce traffic accidents. The first law prohibits all drivers from using a handheld wireless telephone while operating a motor vehicle. Motorists 18 and over may use a hands-free device. The second law states that drivers under the age of 18 may *not* use a wireless telephone or hands-free device while operating a motor vehicle. The purpose of these laws is to prevent traffic accidents due to driver inattention. Driver inattention is defined as a driver being drowsy, engaging in secondary tasks (such as talking on a cell phone), not paying attention to the road ahead, and looking away from the road. In a report written for the National Highway Traffic Safety Administration, the data shows that drivers who engage in complex tasks while driving have a three times higher crash/near crash **risk** than drivers who are paying attention. Driving a motor vehicle is serious business and you need to be well-rested and attentive in order to be a safe driver.

In this science fair project, you will gather your own data to test whether driving while **distracted** affects your ability to focus. You will do this using a video gaming system like the Nintendo® Wii™ and a driving game with a steering wheel, such as Mario Kart. The measure of focus will be the gaming score and the time it takes to complete a driving course in the game. You can see how the gaming score and time are affected by talking on a cell phone and by having an involved conversation with a friend. While you'll have fun doing this science fair project, remember that safety is always serious.

Terms and Concepts

- Risk
- Distractions

Questions

- What is driver inattention?
- What kinds of things do you notice drivers doing when they should be driving?
- How do the crash statistics change when a driver is inattentive or distracted?
- If you take your eye off the road for 2 seconds at 60 miles/hour, how far have you moved forward while not looking ahead?

Bibliography

- California Department of Motor Vehicles. (2010). *New Laws Restrict Cell Phone Usage* Retrieved February 17, 2010, from http://www.dmv.ca.gov/pubs/olin/07_olin/txt/07olin09.htm (http://www.dmv.ca.gov/pubs/olin/07_olin/txt/07olin09.htm)
- Newcomb, D. (2008, May 13). California Hands-Free Cellphone Law Could Save 300 Lives a Year. *Wired Blog Network*. Retrieved August 15, 2008, from <http://blog.wired.com/cars/2008/05/californias-han.html> (<http://blog.wired.com/cars/2008/05/californias-han.html>)
- Insurance Information Institute. (2008, June). *Cellphones and Driving*. Retrieved August 18, 2008, from

<http://www.iii.org/media/hottopics/insurance/cellphones/> (<http://www.iii.org/media/hottopics/insurance/cellphones/>)

For help creating graphs, try this website:

- National Center for Education Statistics (n.d.). *Create a Graph*. Retrieved June 26, 2008, from <http://nces.ed.gov/nceskids/CreateAGraph/default.aspx> (<http://nces.ed.gov/nceskids/CreateAGraph/default.aspx>)

Materials and Equipment

- A gaming system, such as a Nintendo Wii
- Driving game for the gaming system, like Mario Kart
- Steering wheel for the gaming system
- Optional: If you do not have a gaming system and driving game with a steering wheel, you could also use a driving game with a steering wheel at a video arcade.
- Optional: Stopwatch
- Volunteer gamers of equivalent skill (at least 3)
- Cell phones (2)
- Lab notebook
- Graph paper

Experimental Procedure

1. Set up Mario Kart (or other driving game) for single-player play. Find a driving course that you and your gamers like, because you will be driving this course for the entire experiment. Make sure to agree on the difficulty level for each course. *Note:* If your driving game does not provide the time it took to finish the driving course, have a volunteer gamer use a stopwatch for the trials.
2. Allow your gamers to become familiar with the game and particular driving course prior to doing the experiment so that they can drive the course on their own without asking questions during the experiment.
3. Once all of the gamers feel comfortable with the game, start the experiment. Have the first gamer drive the course with no distractions. No one should speak to the gamer while he or she is playing. Once the course is completed, record how long the gamer took to drive the course and his or her score in your lab notebook, in a data table similar to the one shown below.
4. Bring the first gamer back and have him or her drive the course again. But first, have the active gamer use one cell phone to call the other cell phone, held by another volunteer gamer in another room. Then have the gamer who is driving the course hold the cell phone to his or her ear with one hand, and drive with the other hand. One conversation idea for the two is to have the person in the other room ask the gamer to spell a series of words or to work out simple math problems. The gamer needs to be a part of an interesting conversation. At the end of the course, record the course-completion time and the score in your lab notebook.
5. Have the gamer drive the course for a third time. This time, without the cell phone, but while having a challenging conversation with another volunteer gamer, who is in the room, while he or she drives. The gamer needs to be involved with the conversation, but should drive with both hands. At the end of the course, record the course-completion time and the score in your lab notebook.
6. Repeat steps 3-5 two more times with the first gamer. Always record your data in your lab notebook. The gamer should have driven the same course nine times by the end.
7. Repeat steps 3-6 with each additional volunteer gamer. Record all of the results in your lab notebook.

Gamer	Driver Distractions	Completion Time	Course Score
1	No distractions	Trial 1	
		Trial 2	
		Trial 3	
	With a cell phone	Trial 1	
		Trial 2	
		Trial 3	
	Having a conversation	Trial 1	
		Trial 2	
		Trial 3	
2	No distractions	Trial 1	
		Trial 2	
		Trial 3	
	With a cell phone	Trial 1	
		Trial 2	
		Trial 3	
	Having a conversation	Trial 1	
		Trial 2	
		Trial 3	
		Trial 1	

3	No distractions	Trial 2	
		Trial 3	
	With a cell phone	Trial 1	
		Trial 2	
		Trial 3	
	Having a conversation	Trial 1	
		Trial 2	
		Trial 3	

8. Is there any difference in gaming score and completion time across the three different driving conditions? Is talking on a cell phone worse than talking face to face? Plot your data on a graph to see. You can make three separate plots with *Gamer* on the x-axis for all three plots and then *Score (no distractions)*, *Score (with cell phone)*, and *Score (with conversation)* on the y-axes. You can also make three separate plots with *Gamer* on the x-axis and *Completion Time (no distractions)*, *Completion Time (with cell phone)*, and *Completion Time (with conversation)* on the y-axes. If you need help making your plots, or want to do the plots online, go to the following website: [Create a Graph](http://nces.ed.gov/nceskids/CreateAGraph/default.aspx) (<http://nces.ed.gov/nceskids/CreateAGraph/default.aspx>).

Variations

- Find a location where you can watch people driving (have an adult come with you). Take a survey of the kinds of activities that drivers do while driving. What are most inattentive drivers doing? For more information about how to design a survey, visit the Science Buddies page, [Designing an Observation Study](http://www.sciencebuddies.org/science-fair-projects/project_ideas/Soc_observation.shtml) (http://www.sciencebuddies.org/science-fair-projects/project_ideas/Soc_observation.shtml).
- Which distractions affect the gaming score the most? Is talking on the cell phone worse than eating a doughnut? Repeat the experiment investigating a couple of different kinds of distractions.
- California vehicular law states that driving with a hands-free device is legal. Repeat the experiment with a hands-free device. How does playing with a hand-free device affect the score on the course? How does the score compare with driving with a cell phone?

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