Takehome final: Grand Theft Empathy

S520

Upload your typed answers as a PDF file or Word document through the Assignments tab on Canvas by 5 pm, Tuesday 17th December, 2019.

Upload TWO files to the Assignments tab on Canvas: (i) an HTML or PDF file or Word document with written answers, and (ii) a .R/.txt/Markdown file with R code. We will grade the HTML/PDF/Word document and not look at the code unless necessary, so put all your answers in that file, otherwise we'll deduct a bunch of points.

You may consult books and use computers, but may not discuss the problems with anyone except the lecturer and TAs. (Cite any sources you refer to besides the course notes and the textbook.) If your submission is unusually similar to another student's, we might ask you for further explanation of your answers before giving you a grade.

Round answers sensibly, e.g. to 3 significant figures. (You don't want to lose points for something as trivial as rounding.)

Important: For all hypothesis tests, you need to examine assumptions (including appropriate graphs) and give a substantive conclusion, in addition to stating a P-value. If assumptions are not perfectly satisfied, you can still do the test, but you need to say how the data departs from your assumptions.

Topic

> "Empathy is about standing in someone else's shoes, feeling with his or her heart, seeing with his or her eyes. Not only is empathy hard to outsource and automate, but it makes the world a better place." — Daniel Pink

To study the relationship between video games and empathy, researchers performed a randomized experiment on 155 Italian high school students.

Each participant played a randomly selected game of one of three types:

- "Neutral games" with no violent or sexual content (*Dream Pinball 3D* or *Q.U.B.E. 2.*)

- Games from the *Half-Life* series: The researchers considered these games violent but not sexist.

- Games from the *Grand Theft Auto* (GTA) series: The researchers considered these games violent and sexist, and the player's characters in these games to be misogynistic (woman-hating.)

After playing the game, the participants were shown a photo of a victim of violence and asked a series of questions. Their answers were turned into an "empathy score" on a scale from 1 to 7.

In addition, the participants were asked questions about whether they identified (that is, related to) the character they played in the game. Their answers were turned into an "identification score" on a scale from 1 to 7.

The file `GameEmpathy.txt` (in the Data folder on Canvas) contains observations on 153 of the participants in the experiment. (Two observations are omitted because of missing data.) The variables:

- `sex`: Male or female.

- `game.type`: Neutral, Half-Life, or GTA.

- `identify`: A number on a scale from 1 to 7, with 1 meaning the least identification with the character they played, and 7 means the most identification.

- `empathy`: A number on a scale from 1 to 7, with 1 meaning the least empathy and 7 meaning the most empathy.

The researchers also measured "masculine beliefs" after the games were played; we omit this data.

Questions

1. (5 points.) Is there a difference in average empathy between the populations of males and females after playing the games? Draw graphs, perform a test, give a confidence interval, and state your conclusion.

2. (5 points.) Do the different types of game lead to (population) differences in average empathy? Draw graphs, perform an ANOVA, and state your conclusion.

3. (5 points.) Is there a relationship between identification and empathy for:

   (a) Students who played neutral games?
   (b) Students who played *Half-Life*?
   (c) Students who played *GTA*?

   Draw graphs (or do calculations), and state your conclusions. Recall: If your data set is called `GameEmpathy`, you can pick out the data for individuals who played GTA with

   `GTA.players <- GameEmpathy[GameEmpathy$game.type == "GTA",]`

4. (5 points.) Here are the conclusions of the researchers' paper:

   (a) The present research shows that violent-sexist video games such as GTA reduce empathy for female violence victims, at least in the short-term.
   (b) This reduction in empathy partly occurs because video games such as GTA increase masculine beliefs, such as beliefs that "real men" are tough, dominant, and aggressive.
   (c) Our effects [i.e. the reductions in empathy due to violent-sexist video games] were especially pronounced among male participants who strongly identified with the misogynistic game characters.

   For each statement, explain if it (i) is supported by the data you have, (ii) is not supported by the data you have, or (iii) requires more data before firm conclusions can be drawn.

Links

You don't have to read these, but you can if you want to.

- The study: `http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0152121`

- The full data set: `https://osf.io/hu85t/`

- Further analysis by a statistician: `http://www.statschat.org.nz/2016/04/17/evil-within/`