

You may work with one other person on this assignment, submitting one report with both names, provided that both of you contribute substantially to the work.

Predicting Elections from Faces?

Do voters make judgments about political candidates based on his/her facial appearance? Can you correctly predict the outcome of an election, more often than not, simply by choosing the candidate whose face is judged to be more competent-looking? Researchers investigated this question in a study published in *Science* (Todorov, Mandisodka, Goren, and Hall, 2005). Participants were shown pictures of two candidates and asked who has the more competent-looking face. Researchers then predicted the winner to be the candidate whose face was judged to look more competent by most of the participants. For the 32 U.S. Senate races in 2004, this method predicted the winner correctly in 23 of them.

(a) In what proportion of the races did the “competent face” method predict the winner correctly?

(b) Describe (in words) the null model to be investigated with this study.

(c) Describe how you could (in principle) use a coin to produce a simulation analysis of whether these data provide strong evidence that the “competent face” method would correctly predict the election winner more than half the time. Include enough detail that someone else could implement the full analysis and draw a reasonable conclusion.

(d) Use the Coin Tossing applet (see link in under “Data and Applets” from course web page) to conduct a simulation (using 1000 repetitions), addressing the question of whether the researchers’ results provide strong evidence in support of the researchers’ conjecture that the “competent face” method would correctly predict the election winner more than half the time. Submit a print-out of the applet output (you can use the “print screen” key), and indicate where the observed research result falls in that distribution. Also report the approximate p-value from this simulation analysis.

(e) Write a paragraph, as if to the researchers, describing what your simulation analysis reveals about whether the data provide strong evidence in support of their conjecture.

These researchers also predicted the outcomes of 279 races for the U.S. House of Representatives in 2004. The “competent face” method correctly predicted the winner in 189 of those races.

(f) Use the applet to conduct a simulation analysis of these data. Again submit a print-out of the “what if?” distribution, and indicate where the observed research result falls in that distribution. Also report the approximate p-value, and summarize your conclusion, again as if to the researchers.