Assignment 4

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Exercise 1

Molitor (1989) conducted a study to see if children who watched TV or film violence were significantly more tolerant of "real-life" violent behavior than children who instead watched a nonviolent TV show or film.

Half of the 42 children in the study were shown violent TV (an edited version of The Karate Kid), whereas the other half watched exciting but nonviolent sports (highlights from the 1984 Summer Olympic Games). Each child was asked to "watch over" two younger children, supposedly in the next room, via a television monitor. Each child was instructed to go and get the research assistant (who stated she had to leave for an emergency) if the younger children "got into trouble." What each child witnessed, while alone, was actually a videotaped sequence depicting two small children first play with blocks and then progressively get more violent. That is, they called each other names, then pushed each other, chased each other, fought, and then supposedly broke a video camera while fighting.

Toleration of violence was measured by the time (in seconds) each child stayed in the room after he or she witnessed the two younger children's first act of violence. As soon as the subject child left the room, the timing clock was stopped. Each child was subsequently assured that an adult had entered the room where the two children were and that they were not hurt and the video camera was not damaged.

Do the data indicate that the children who viewed the violent TV tend to take longer to seek help (were more tolerant) than the children who viewed the nonviolent sports-action TV?

Olympics watchers	Karate Kid watchers
12	37
44	39
34	30
14	7
9	13
19	139
156	45
23	25
13	16
11	146
47	94
26	16
14	23
33	1
15	290
62	169
5	62
8	145
0	36
154	20
146	13

(1) Specify the hypotheses.

(2) What test is appropriate? Explain the assumptions underlying the chosen test in this context.

(3) Perform the test, using both the (exact) permutation test and large-sample approximation test, and make conclusions.

(4) Estimate the effect of violent TV and 95% confidence interval.

(5) Summarize your findings in (3) and (4), as if you are the scientist of the 1989 study.

(6) Pretend we only the first three rows of data, calculate by hand, the permutation null distribution of the test statistic, p-value; and also check the large-sample approximation test. Which result is more reliable here and why?

(7) Use R to obtain the permutation distributions for mean difference and two-sample t-test statistic, calculate the p-values based on both statistics. Do you have qualitatively different conclusions, compare with what you have in (3) ? Since the sample size is not too small, you may set the number of permutations to be 1000 (or a bit larger), it is good enough to have an approximate permutation distributions.