

9.7: Running the Hypothesis Test in Practice

At this point some of you might be wondering if this is a “real” hypothesis test, or just a toy example that I made up. It’s real. In the previous discussion I built the test from first principles, thinking that it was the simplest possible problem that you might ever encounter in real life. However, this test already exists: it’s called the *binomial test*, and it’s implemented by an R function called `binom.test()`. To test the null hypothesis that the response probability is one-half $p = .5$,¹⁶⁴ using data in which $x = 62$ of $n = 100$ people made the correct response, here’s how to do it in R:

```
binom.test( x=62, n=100, p=.5 )
```

```
##
## Exact binomial test
##
## data: 62 and 100
## number of successes = 62, number of trials = 100, p-value =
## 0.02098
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
## 0.5174607 0.7152325
## sample estimates:
## probability of success
## 0.62
```

Right now, this output looks pretty unfamiliar to you, but you can see that it’s telling you more or less the right things. Specifically, the p-value of 0.02 is less than the usual choice of $\alpha = .05$, so you can reject the null. We’ll talk a lot more about how to read this sort of output as we go along; and after a while you’ll hopefully find it quite easy to read and understand. For now, however, I just wanted to make the point that R contains a whole lot of functions corresponding to different kinds of hypothesis test. And while I’ll usually spend quite a lot of time explaining the logic behind how the tests are built, every time I discuss a hypothesis test the discussion will end with me showing you a fairly simple R command that you can use to run the test in practice.

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