

# LING82100: homework 2 solution

## 1 Reporting a binomial test

```
> x <- 501
> n <- x + 1859
> binom.test(x, n, .5)
```

Exact binomial test

```
data: x and n
number of successes = 501, number of trials = 2360, p-value < 2.2e-16
alternative hypothesis: true probability of success is not equal to 0.5
95 percent confidence interval:
 0.1959431 0.2293504
sample estimates:
probability of success
          0.2122881
```

Sample report:

In a sample of  $n = 2,360$  dative clauses, we obtained 501 prepositional datives and 1,859 double objects. We observe a preference for the double object construction (test statistic  $p = .212$ ; 95% CI: .196, .229), a significant effect at  $\alpha = .05$  (binomial test,  $p < .001$ ).

Note that you could just as well define  $x <- 1859$  and you'd get different different sample parameters and confidence intervals, but the same test statistic and the same significance result.

## 2 McNemar's test

```
> d <- read.table("http://wellformedness.com/courses/LING82100/Data/PTB.tsv",
                 header = TRUE, comment.char = "")
> Stanford.correct <- with(d, gold.tag == Stanford.tag)
> NLP4J.correct <- with(d, gold.tag == NLP4J.tag)
> x1 <- sum(Stanford.correct & !NLP4J.correct)
```

```
> x2 <- sum(NLP4J.correct & !Stanford.correct)
> x <- min(x1, x2)
> n <- x1 + x2
> binom.test(x, n, .5)
```

Exact binomial test

```
data: x and n
number of successes = 943, number of trials = 1959, p-value = 0.1038
alternative hypothesis: true probability of success is not equal to 0.5
95 percent confidence interval:
 0.459029 0.503763
sample estimates:
probability of success
      0.481368
```

Sample (abridged) report:

...We fail to reject the null hypothesis at  $\alpha = .05$  (McNemar's test,  $p = .104$ ).