

## BIOL 300 Assignment 4, Spring 2012

### Chapter 6

11. (a) Alternative hypothesis  
(b) Null hypothesis  
(c) Alternative hypothesis  
(d) Null hypothesis  
(e) Alternative hypothesis
15. (a)  $H_0$ : Males from the two populations have the same probability of being chosen (i.e.,  $p = 0.5$ , where  $p$  is the probability that a female chooses the male from her own population).  $H_A$ : Females choose one type of male over the other (i.e.,  $p \neq 0.5$ ).  
(b) Because either outcome, that females prefer their own males ( $p > 0.5$ ) or that females prefer the other males ( $p < 0.5$ ), is possible.  
(c)  $P = 2 \times (\text{Pr}[12] + \text{Pr}[13] + \dots \text{Pr}[18]) = 0.238$ .  
(d)  $P$  is the chance, if the null hypothesis is true, that 12 or more females out 18 choose their own males, or that 6 or fewer would do so.  
(e) The estimate of  $p$ , the proportion of females choosing their own males is  $12/18 = 0.67$ . (Note that the estimate of the parameter differs from the null hypothesis that the proportion is 0.5).
16. (a) The smaller, 60-subject study.  
(b) The larger, 100-subject study.  
(c) Both studies have the same probability of a Type-I error.  
(d) Two-tailed (it is not inconceivable that COX-2 would reduce the risk of cardiac arrest).
17. The study probably reported a  $P$ -value of 0.01. The correct interpretation is that under the null hypothesis, the probability is 0.01 of obtaining a sex ratio as different (or more different) from the continental average as that observed.