Stat 243 – GS04

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Section 3.1

3.14 Population mean = 300 SE = 5 (approx)

3.18 (a) iii (b) i (c) ii

3.23 (a) Sample mean $\bar{[x]} = 27.9$ Population mean $\mu = 30$ (b) Bell-shaped and centered at 30 (c) 1000 dots where each represents a mean for n = 75

3.24 (a) B and C are biased because they are not centered at the mean of 2.61. Maybe the sampling for dotplot C was taken from a place with many single people. (b) A matches with size n = 100 and D with n = 500

Section 3.2 3.42 $\mu[1] - \mu[2] = 5 + 8 = 13$ $\mu[1] - \mu[2] = 5 - 8 = -3$ Interval = (-3, 13)

3.51 (a) Statistic; $\hat{p} = 0.30$ (b) Proportion, p, of all US young people arrested by 23; ^p = 0.30 (c) 0.29 to 0.31 (d) Very unlikely

3.52 (a) Population is American adults above 18 years old Sample is 147,291 adults, aged 18 and over, living in the US Parameter is proportion of American adults getting health insurance from an employer Statistic is sample proportion of US adults getting their health insurance from an employer (b) ME = 0.01 [0.45-0.01, 0.45+0.01] = [0.44, 0.46]

3.53 Since there is a 95% confidence, we can say that the proportion of adults in the US who considered car a necessity lies between 0.83 - 0.89.

3.58 (a) Matched pairs since it helps us control lurking variables such as age and gender (b) The difference of means of BPA levels (c) We are 95% confident that the true mean difference in BPA level lies between 19.6 to 25.5 (d) Narrower

3.60 (a) 6.8 lbs (b) We can collect the population that overrears for a month and get the result after 2.5 years (c) (point estimation) +/- (z*)(SE) = 6.8 +/- (2)(1.2) => CI = (4.4, 9.2) (d) margin of error = (2)(SE) = 2.4. This means that 6.8 is 2.4 pounds within the true weight gain

3.64 (a) This is wrong because the interpretation is not of all students but the population's mean (b) This is wrong because the interpretation is not of a sample but a population (c) The population lies within the interval not goes from 65.5 to 71.8 (d) This is wrong because the interpretation is not 100% sure but 95% sure of the mean between the CI (e) This is wrong because the interpretation is associated with students of all US colleges whereas it is simply about a certain college (f) 95% refers to the certainty not the percentage of values between the CI (g) 95% refers to the certainty not the percentage of sample between the CI

Section 3.3 3.66 (a) Yes (b) Yes (c) Yes (d) No because 78 and 81 do not belong to the original sample (e) Yes (f) Yes

3.75 (a) 26/174 = 0.1494 is the best point estimate (b) SE = 0.028 (c) 0.15 +/- (2)(0.028) => CI = (0.093, 0.205) (d) Yes because it falls between the CI

3.76 (a) mean = 34 sd = 13.684 (b) You take a sample from the eight slips and then you resample from that sample (c) Bell Shaped and centered at mean (d) Population parameter is the mean of population and point estimate is the bootstrap mean of the bootstrap sample (e) 34 +/- (2)(4.85) => CI = (24.3, 43.7)

3.78 Sample mean = 605 CI = (463.81, 746.19) We can say that we are 95% confident that the average monthly sales in the US lie between intervals (463.81, 746.19)

3.81 (a) 0.015 (b) 0.1206, 0.1794 This means that 95% of the time, the difference in proportion of teen and adult cell phone users who send/receive text messages lies between 0.1206 and 0.1794

3.84

```r
mean(~Distance, data=CommuteAtlanta)
```

```
## [1] 18.156
```

```r
sd(~Distance, data=CommuteAtlanta)
```

```
## [1] 13.79828
```

```r
bag <- do(1000) * mean(~Distance, data=resample(CommuteAtlanta))
sd(~mean, data=bag)
```

```
## [1] 0.6284666
```

(d) 18.156 +/- 2*(0.) => CI = (16.92659, 19.38541)

Section 3.4

3.89 (a) 25 (b) 50 (c) 10 (d) 5

3.90 A

3.91 C

3.92 C

3.93 A

3.94 B

3.95 B

3.100 (a) 100.104 (b) 100.104 +/- 3*4.798 =

3.102 proportion = 753/1000 z = 1.645*sqrt(0.753*(1-0.753)/1000) = [0.731, 0.775]

3.105 [24.69, 20.76]

Section 6.1

6.4 mean = 0.27 SE = sqrt(0.27(1-0.27)/30) = 0.0811

6.10 (a) mean = 0.69, sd = sqrt(0.69(1-0.69)/100) = 0.0463 (b) mean = 0.69, sd = sqrt(0.69(1-0.69)/1000) = 0.0146 (a) mean = 0.75, sd = sqrt(0.75(1-0.75)/100) = 0.0433 (a) mean = 0.75, sd = sqrt(0.75(1-0.75)/1000) = 0.0137

6.12 sd(0.8) = 0.04, sd(0.5)=0.05, sd(0.3)=0.046, sd(0.1)=0.03 The standard error is greatest for the proportion of P = 0.5

6.16 (a) mean = 0.4, sd = sqrt(0.4*(1-0.4)/50) = 0.069

6.18 mean = 0.2, sd = sqrt(0.2*(1-0.2)/10) = 0.126 mean = 0.2, sd = 0.1265