Problem Set 2

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A)

$\left(\frac{1}{2}\right)(x) + \left(\frac{1}{2}\right)(1-x) = \frac{1}{2} = .50$

B)

i)

```
m <- mean(cards$trade)
## Proportion trading:
m
```

```
## [1] 0.3378378
```

ii and iii)

```
t.test(cards$trade, mu=.5)
```

```
##
##  One Sample t-test
##
## data:  cards$trade
## t = -4.1569, df = 147, p-value = 5.456e-05
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
##  0.2607447 0.4149310
## sample estimates:
## mean of x
## 0.3378378
```

95% confidence interval: (0.261, 0.415)

t = -4.1569, greater in magnitude than -1.96.

This is significant.

iv)

As less than half the traders were not willing to trade their card for an opposite card even though they had the same value, we can see evidence of the endowment effect, but we cannot state if it is causal.

C)

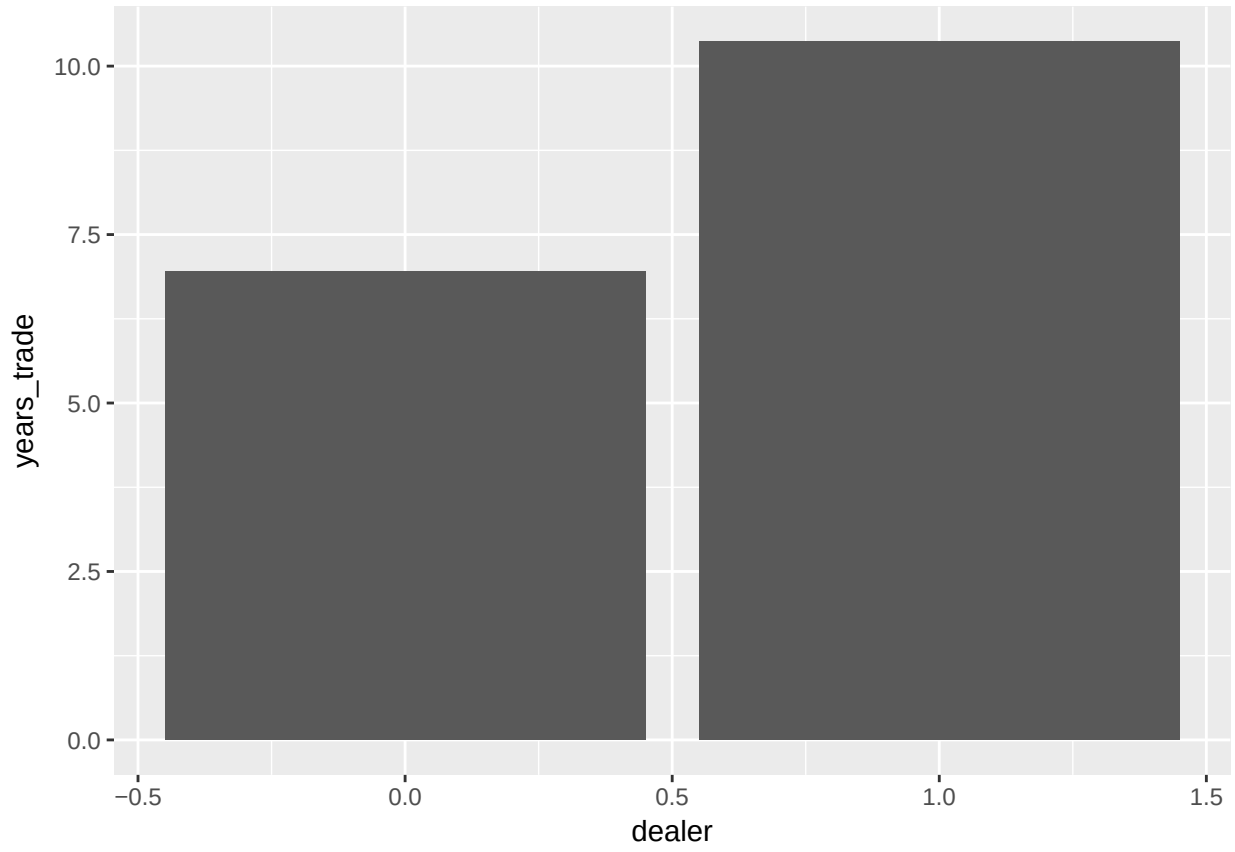
i)

```
mean(subset(cards,dealer==1)$years_trade)-mean(subset(cards,dealer==0)$years_trade)
```

```
## [1] 3.418919
```

ii)

```
p <- data.frame(dealer=c(1,0),years_trade=c(mean(subset(cards,dealer==1)$years_trade),mean(subset(cards
ggplot(data = p) +
  geom_bar(aes(x = dealer, y = years_trade),stat="summary",fun.y="mean")
```



iii)

```
dealer.set <- subset(cards,dealer==1)

t.test(dealer.set$trade, mu=.5)
```

```
##
##  One Sample t-test
##
```

```
## data:  dealer.set$trade
## t = -0.92912, df = 73, p-value = 0.3559
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
##  0.3299982 0.5618937
## sample estimates:
## mean of x
## 0.4459459
```

mean: 0.4459

95% confidence interval: (0.3240, 0.5619)

t = -0.92912, NOT greater in magnitude than -1.96.

This is not significant under the proportion T test and the value lies in the confidence interval, so we do not reject the null hypothesis. There is not evidence of the endowment effect.

```
nondealer.set <- subset(cards,dealer==0)

t.test(nondealer.set$trade, mu=.5)
```

```
##
##  One Sample t-test
##
## data:  nondealer.set$trade
## t = -5.4895, df = 73, p-value = 5.559e-07
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
##  0.1316057 0.3278538
## sample estimates:
## mean of x
## 0.2297297
```

mean: 0.2297

95% confidence interval: (0.1316, 0.3278)

t = -5.4895, greater in magnitude than -1.96.

This is statistically significant and is not in the confidence interval, so there appears to be evidence of the endowment effect; however, we cannot necessarily state a causal effect.

D)

```
male <- subset(cards,male==1)
t.test(male$trade)
```

```
##
##  One Sample t-test
##
## data:  male$trade
## t = 8.4935, df = 132, p-value = 3.661e-14
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  0.2710820 0.4356849
## sample estimates:
## mean of x
```

```
## 0.3533835
```

mean: 0.3534

95% confidence interval: (0.2711, 0.4357)

t = 8.4935, greater in magnitude than 1.96.

This is statistically significant and is not in the confidence interval, so there appears to be evidence of the endowment effect; however, we cannot necessarily state a causal effect.

```
female <- subset(cards,male==0)
t.test(female$trade, mu=.5)
```

```
##
##  One Sample t-test
##
## data:  female$trade
## t = -2.8062, df = 14, p-value = 0.01401
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
##  -0.02928734  0.42928734
## sample estimates:
## mean of x
##       0.2
```

mean: 0.20

95% confidence interval: (-0.02929, 0.4293)

t = -2.8062, greater in magnitude than 1.96.

This is statistically significant and is not in the confidence interval, so there appears to be evidence of the endowment effect; however, we cannot necessarily state a causal effect.

All in all, there seems to be results of the endowment effect in both males and females. Whether this difference is significant between males and females would require a difference between proportions hypothesis test, which is beyond the scope of what was asked.

E)

```
educated <- subset(cards,education > 4 & dealer == 1)
noneducated <- subset(cards,education <= 4 & dealer == 1)

t.test(educated$trade, noneducated$trade)
```

```
##
##  Welch Two Sample t-test
##
## data:  educated$trade and noneducated$trade
## t = 0.51605, df = 28.058, p-value = 0.6099
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.2120742  0.3549314
## sample estimates:
## mean of x mean of y
## 0.5000000 0.4285714
```

The T-test indicates that there is not a statistically significant difference in trading proportions of college-educated and higher dealers versus dealers without a college education or lower. Therefore, there does not seem to be an impact of education on experience; the effect of experience seems to be consistent regardless of education.