Experience on Elicited Risk: Hypothesis and Data Analysis

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Data description

This dataset contains the result from 6 experimental sessions.

Session	N	Age	Women	G_1	G_2	CRT	Correct	G_Change	n_Even	Explore
1	21	20.76	0.52	4.10	4.76	1.86	0.90	0.67	12.14	0.86
2	11	20.36	0.55	3.18	3.64	1.82	11.73	0.45	11.45	0.82
3	21	19.71	0.67	3.52	3.67	1.76	10.38	0.14	11.86	0.86
4	20	19.65	0.55	4.45	4.20	2.20	11.30	-0.25	11.80	0.80
5	20	20.40	0.50	3.45	3.80	1.20	11.50	0.35	12.10	0.80
6	6	19.00	0.83	2.50	2.50	0.83	12.00	0.00	13.00	1.00

Risk elicited

In this study, the Eckle and Grossman risk elicitation task was implemented before and after the participants experience 24 realizations of the tasks. These correspond with **Gamble.1** and **Gamble.2** variables. Next table show the 6 gambles presented to the participants; events **odd** and **even** are equally probable and they had to choose only one gamble.

Notice the expected payoff is increasing from Gamble 1 to 5, and then it decreases to 34 (the same as gamble 4), but in this case choosing gamble 6 clearly elicits risk loving preferences.

Experience periods

The 24 experience periods correspond to realization of a gamble chosen. In the first 12, a gamble was pre-selected (variables **R1** to **R12**) and the participants throw two dice to determine the events (variables **E1** to **E12**) and wrote down the corresponding payoff (variables **P1** to **P12**). In the last 12, a gamble was chosen by the participants (variables **F1** to **F12**) and the participants throw two dice to determine the events (variables **EF1** to **EF12**) and wrote down the corresponding payoff (variables **PF1** to **PF12**). The 24 periods of realizations didn't affected the final payoff, but one of them (**Period.to.review**) was selected to check if they wrote down the correct payoff and then earned an extra dollar (**Correct.Payoff**).

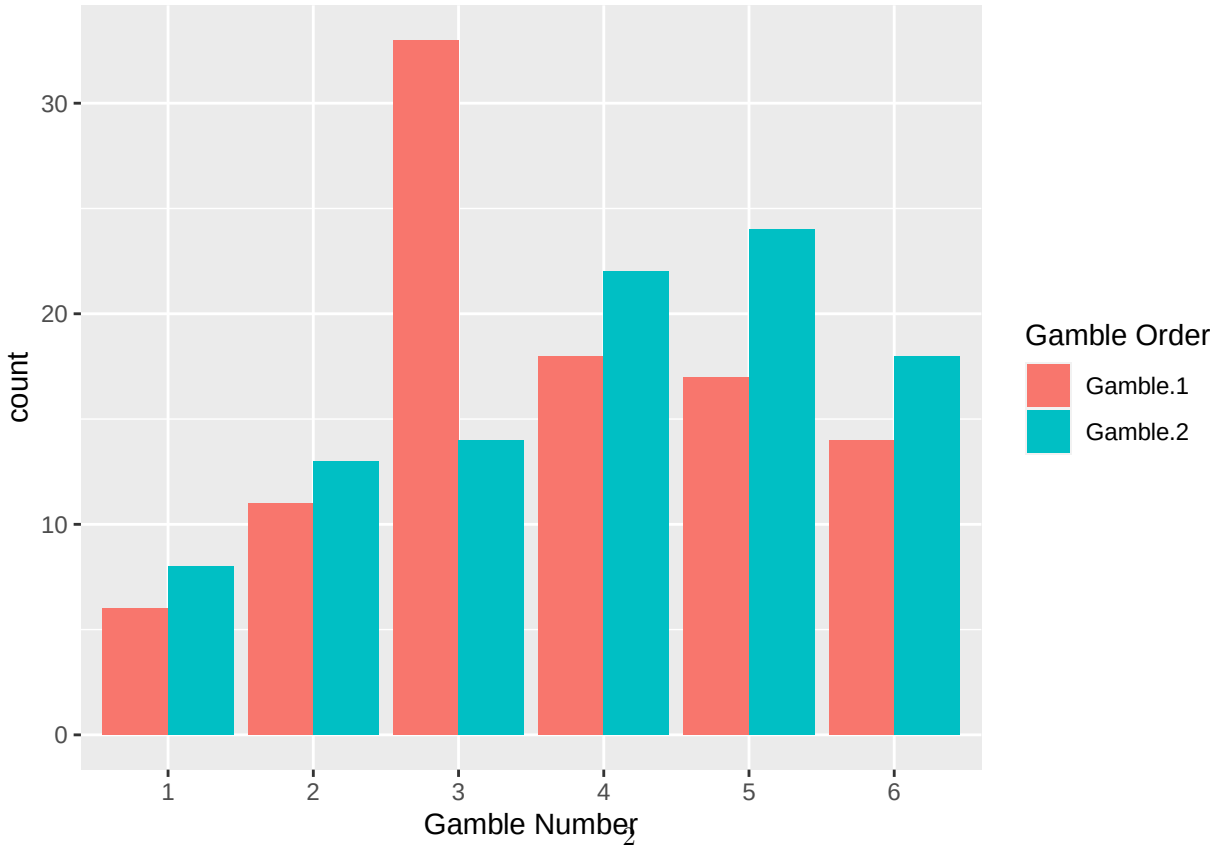
Potential Payments	Event	
Gamble	Odd	Even
1	28	28
2	36	24
3	44	20
4	52	16
5	60	12
6	66	2

Figure 1: Payoff table of the gambles as presented to the participants.

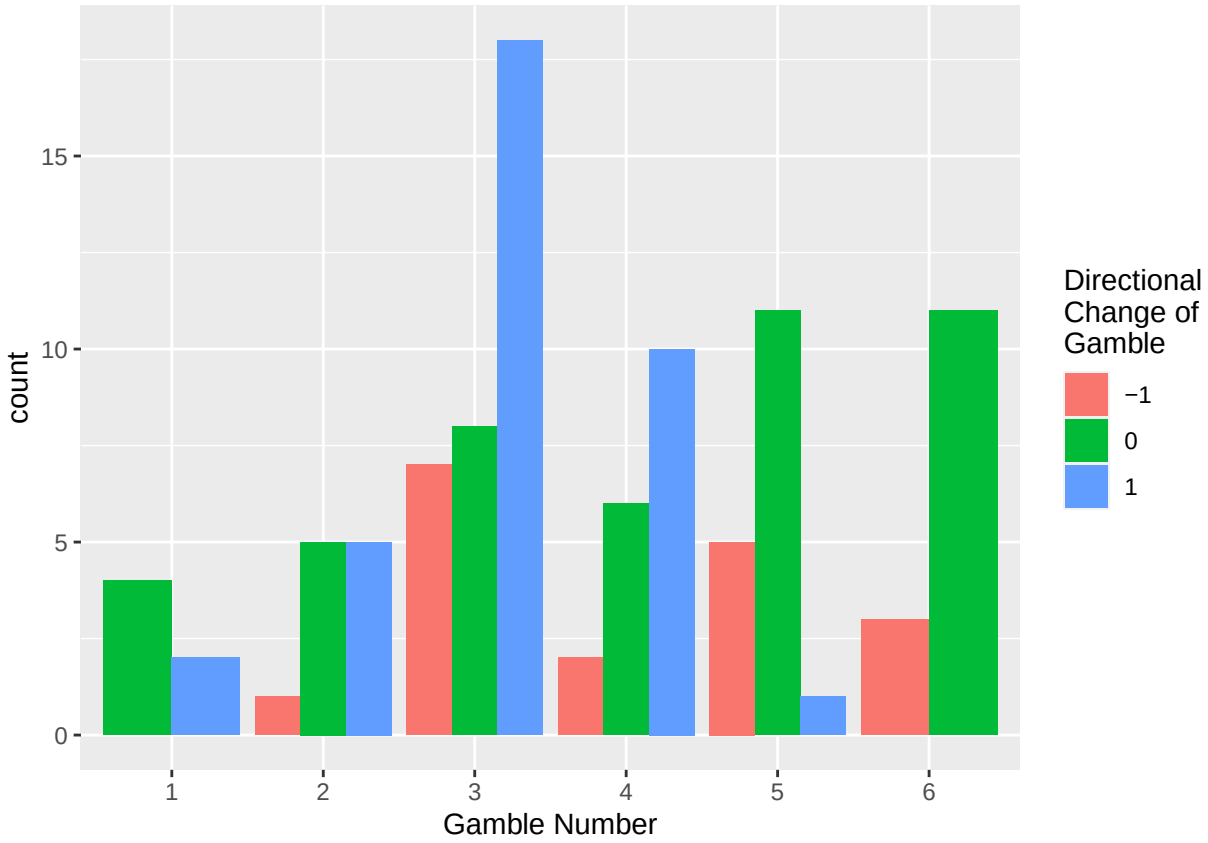
Hypothesis

Participants display larger levels of risk tolerance

G2 - G1



The direction of the change is driven mostly by people choosing gamble 3 at the beginning and moving upwards.

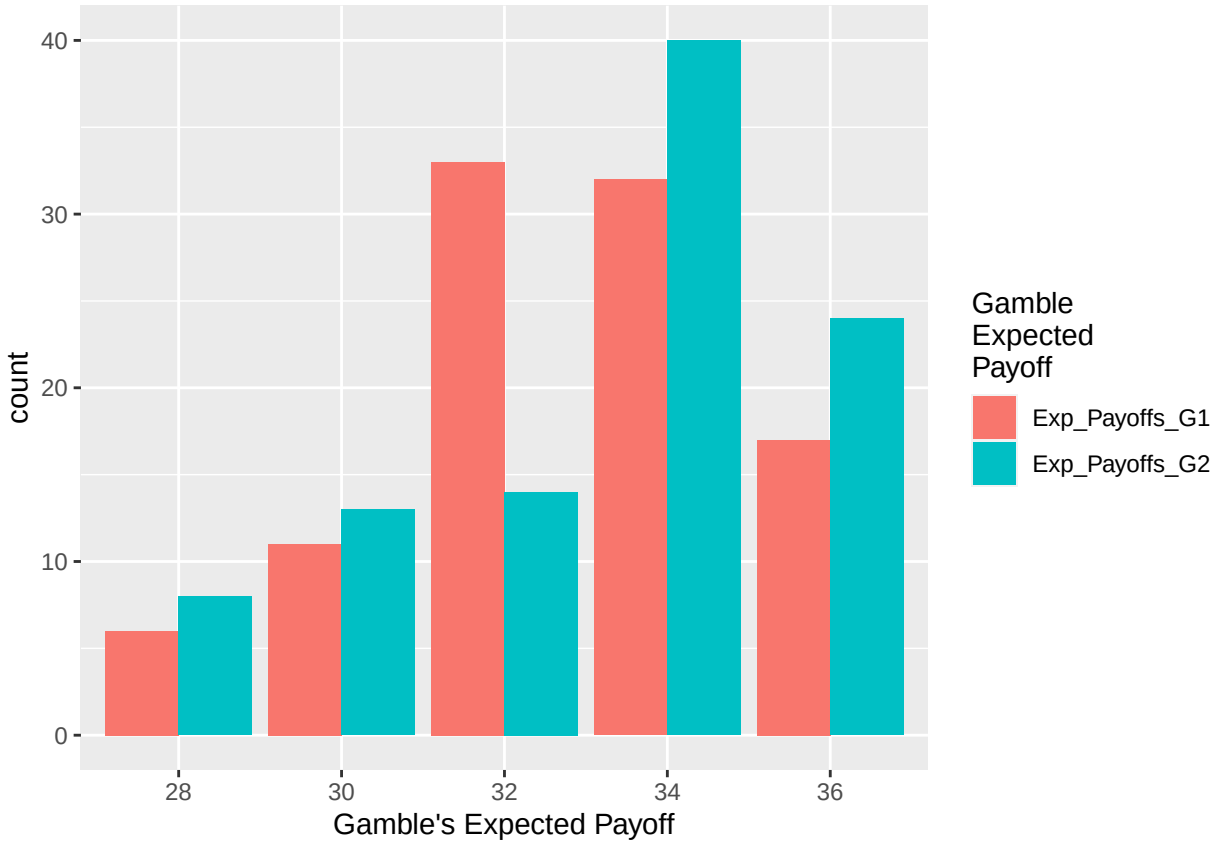


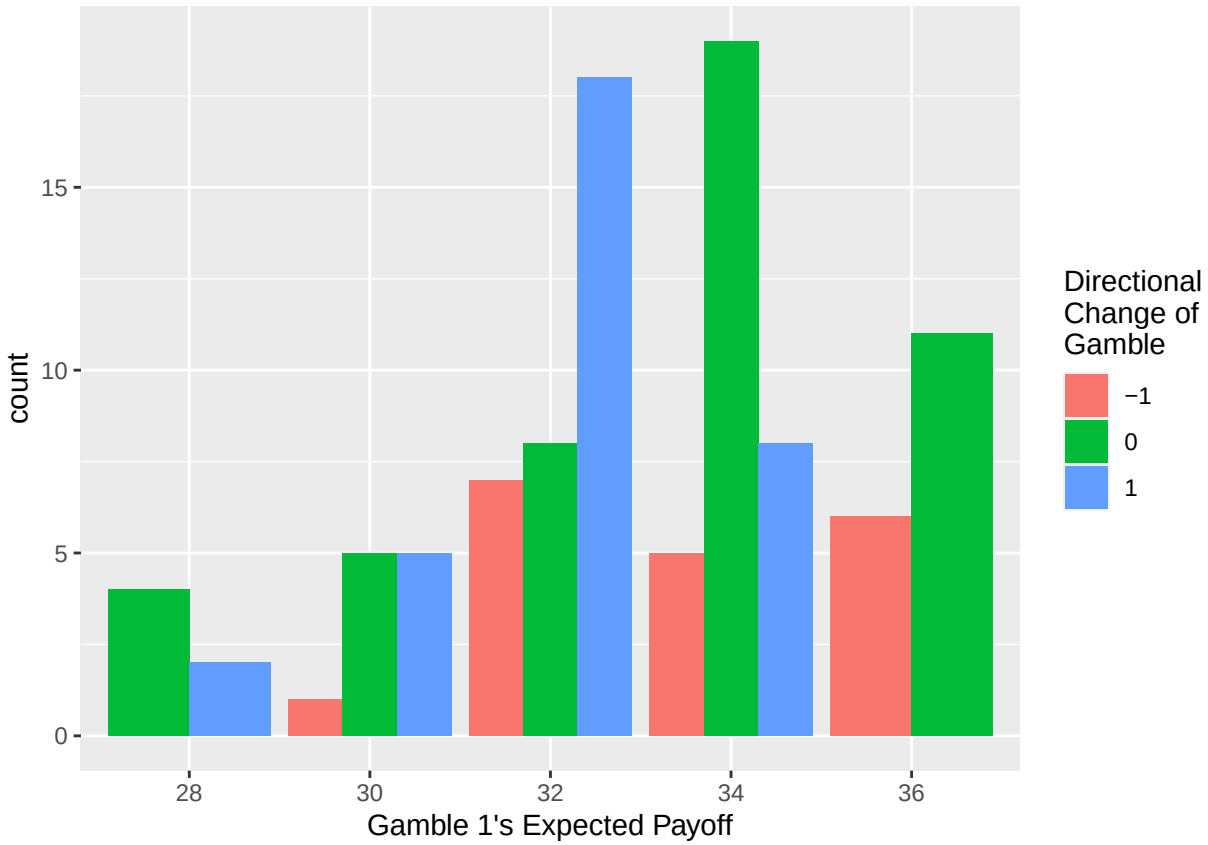
The Wilcox test shows that the difference is significant at 5% when analyzing the hypothesis that Gamble 2 is greater.

```
wilcox.test(x = ExperienceRisk_Sessions$simple_diff,alternative = "greater")
```

```
##
##  Wilcoxon signed rank test with continuity correction
##
## data:  ExperienceRisk_Sessions$simple_diff
## V = 952, p-value = 0.03143
## alternative hypothesis: true location is greater than 0
```

EP 1 - EP2


40
30
20
10
0
count
28
30
32
34
36
Gamble's Expected Payoff
Gamble
Expected
Payoff
Exp_Payoffs_G1
Exp_Payoffs_G2



The Wilcox test shows that the difference is significant at 10% when analyzing the hypothesis that Gamble 2 is greater.

```
wilcox.test(x = ExperienceRisk_Sessions$diff_Exp_Payoffs,alternative = "greater")
```

```
##
##  Wilcoxon signed rank test with continuity correction
##
## data:  ExperienceRisk_Sessions$diff_Exp_Payoffs
## V = 843.5, p-value = 0.07127
## alternative hypothesis: true location is greater than 0
```

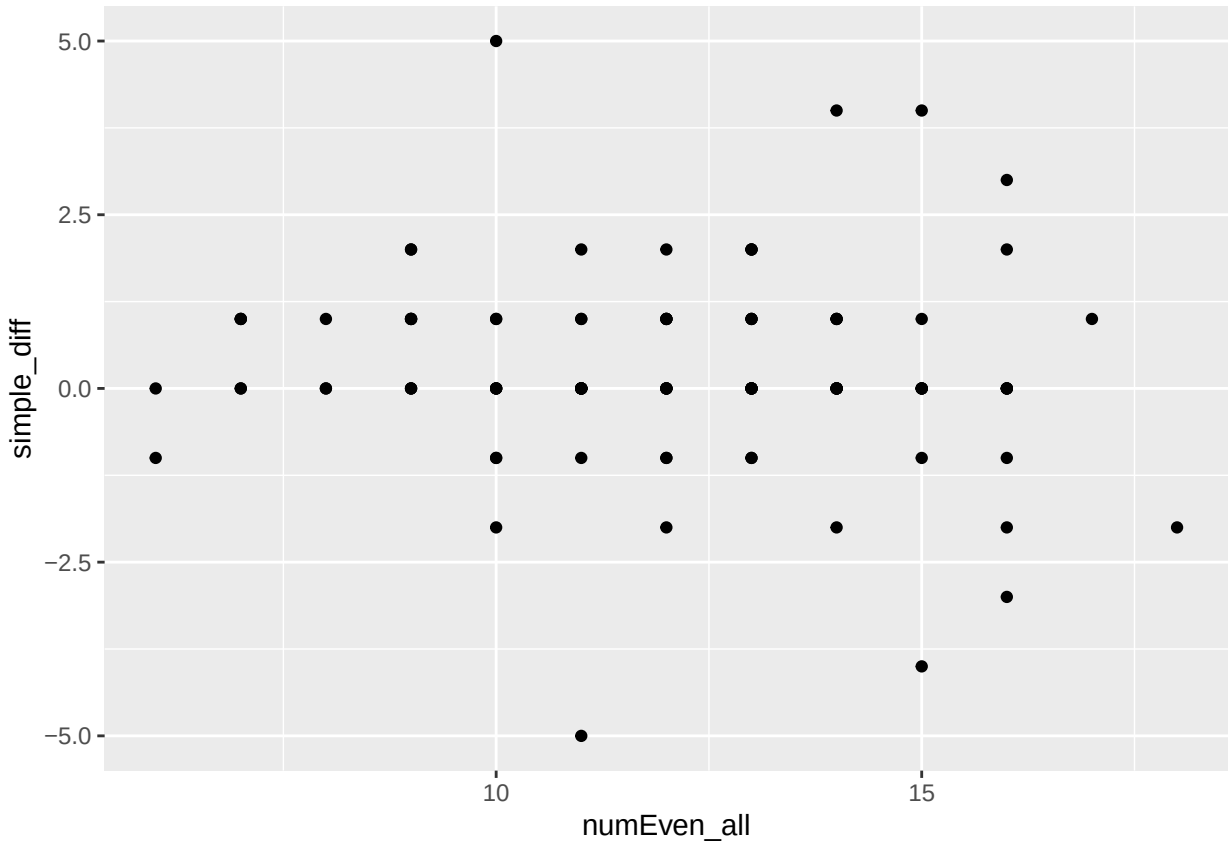
```
ExperienceRisk_Sessions %>% tabyl(Gamble.1,Gamble.2)
```

```
##  Gamble.1 1 2 3  4  5  6
##         1 4 0 1  0  0  1
##         2 1 5 3  0  0  2
##         3 2 5 8 12  5  1
##         4 0 2 0  6  8  2
##         5 0 0 1  4 11  1
##         6 1 1 1  0  0 11
```

Larger number of Even events will make people changing downwards

Gamble 1 - Gamble 2

```
ggplot(data = ExperienceRisk_Sessions) +
  geom_point(aes(x=numEven_all,y=simple_diff))
```

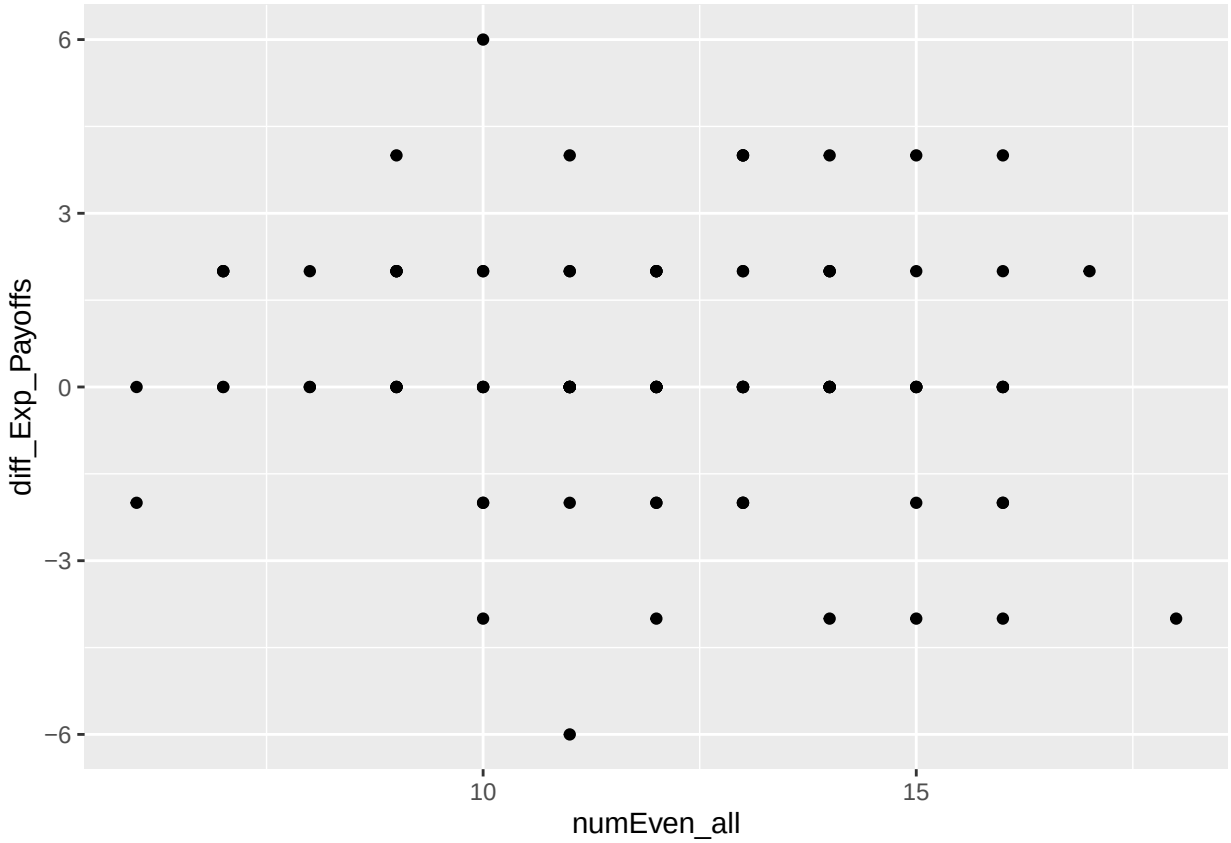



```
m1 <- lm(simple_diff ~
           numEven_all,
         data = ExperienceRisk_Sessions)
summary(m1)
```

```
##
## Call:
## lm(formula = simple_diff ~ numEven_all, data = ExperienceRisk_Sessions)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -5.2898 -0.3865 -0.1448  0.7102  4.6619
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.82157    0.65065   1.263    0.210
## numEven_all -0.04834    0.05300  -0.912    0.364
##
## Residual standard error: 1.416 on 97 degrees of freedom
## Multiple R-squared:  0.008505,   Adjusted R-squared:  -0.001716
## F-statistic: 0.8321 on 1 and 97 DF,  p-value: 0.3639
```

There is no significant effect of the overall number of events on the difference between Gamble 1 and 2.

Excpected Payoff 1 - Expected Payoff 2




```
##
## Call:
## lm(formula = diff_Exp_Payoffs ~ numEven_all, data = ExperienceRisk_Sessions)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -6.4129 -0.5960 -0.2298  1.4498  5.4955
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.41982    0.96026   1.479    0.142
## numEven_all -0.09154    0.07822  -1.170    0.245
##
## Residual standard error: 2.09 on 97 degrees of freedom
## Multiple R-squared:  0.01392,    Adjusted R-squared:  0.003758
## F-statistic:  1.37 on 1 and 97 DF,  p-value: 0.2447
```

There is no significant effect of the overall number of events on the difference between Expected Payoffs in Gamble 1 and 2.

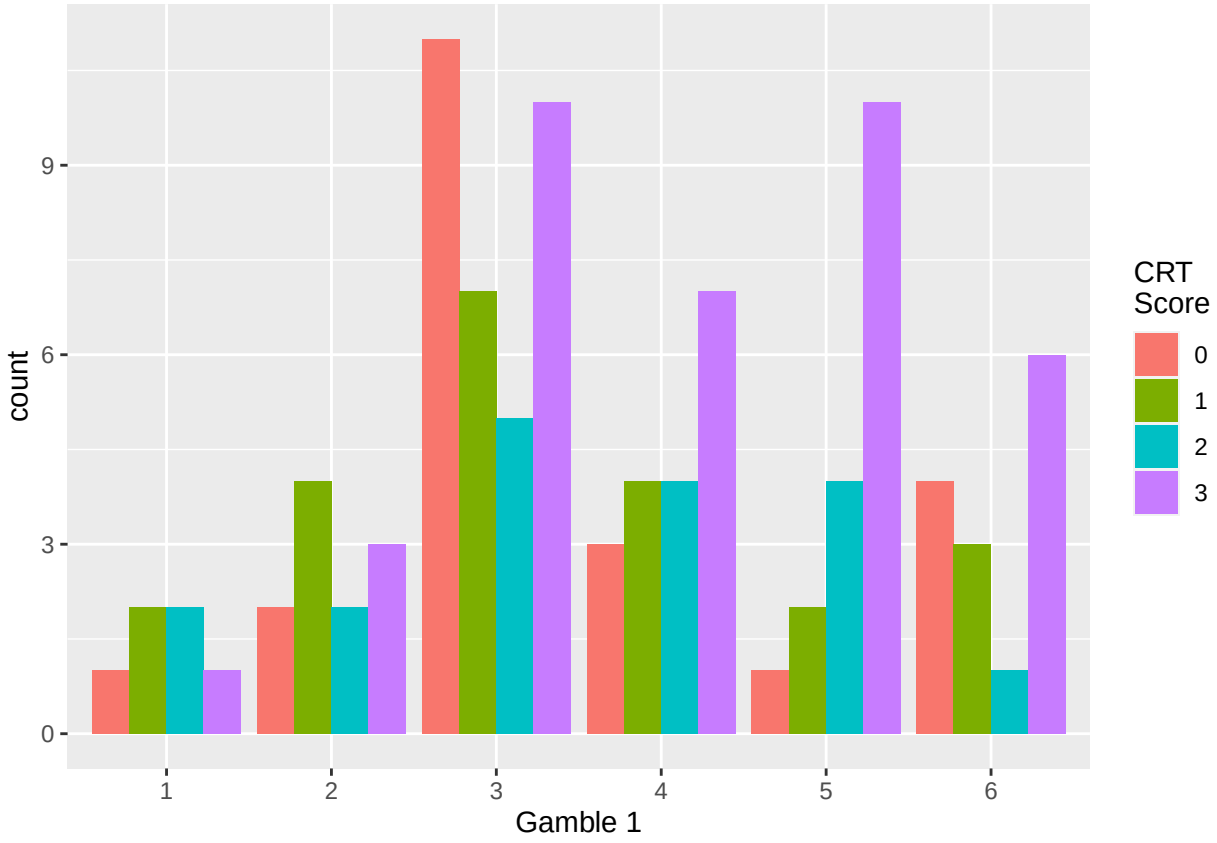
CR predicting more changes

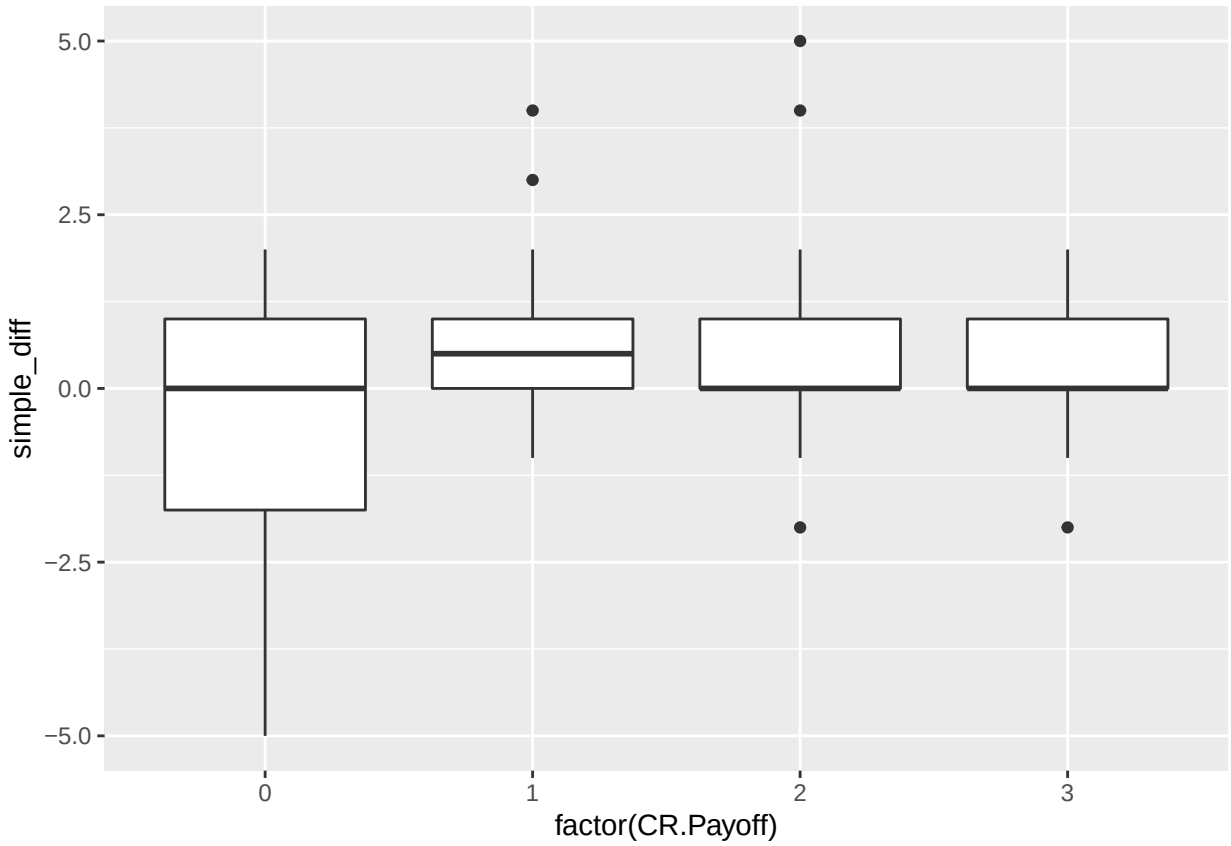
```
ExperienceRisk_Sessions %>%
  mutate(G1 = factor(Gamble.1),
         CRT = factor(CR.Payoff)) %>%
```

```
tabyl(G1,CRT)
```

```
##  G1  0 1 2  3
##   1  1 2 2  1
##   2  2 4 2  3
##   3 11 7 5 10
##   4  3 4 4  7
##   5  1 2 4 10
##   6  4 3 1  6
```

G2 - G1






```
##
## Call:
## lm(formula = simple_diff ~ CR.Payoff > 0, data = ExperienceRisk_Sessions)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.4091 -0.4805 -0.4805  0.5195  4.5195
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)        -0.5909     0.2876  -2.054  0.04262 *
## CR.Payoff > 0TRUE   1.0714     0.3261   3.285  0.00142 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.349 on 97 degrees of freedom
## Multiple R-squared:  0.1001, Adjusted R-squared:  0.09085
## F-statistic: 10.79 on 1 and 97 DF,  p-value: 0.001419
```

There is an effect of the CR when considering a dummy for having achieved at least one point in the test. If people got at least one point, they will increase by one the number of the gamble they chose.