Pitch and Rhythm

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```
library(tidyverse)
library(magrittr)
```

Load the data.

```
data_Intact <- read_csv('pitch_rhythm_resp_Intact.csv', show_col_types = FALSE)
data_8B <- read_csv('pitch_rhythm_resp_8B.csv', show_col_types = FALSE)
data_2B <- read_csv('pitch_rhythm_resp_2B.csv', show_col_types = FALSE)
data_1B <- read_csv('pitch_rhythm_resp_1B.csv', show_col_types = FALSE)
```

Intact

```
summary(lm(n_M_resp ~ abs(pitch_change)*abs(rhythm_change), data_Intact))
```

```
##
## Call:
## lm(formula = n_M_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_Intact)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.7163 -0.4757 -0.4313  0.5147  5.4985
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.391691   0.065515   5.979 3.78e-09 ***
## abs(pitch_change)                  0.006571   0.014544   0.452    0.652
## abs(rhythm_change)                 0.033958   0.030396   1.117    0.264
## abs(pitch_change):abs(rhythm_change) 0.002535   0.007602   0.333    0.739
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7913 on 627 degrees of freedom
## Multiple R-squared:  0.00734,    Adjusted R-squared:  0.00259
## F-statistic: 1.545 on 3 and 627 DF,  p-value: 0.2016
```

For musicians, pitch and rhythm explain 0.26% of the variance in number of participants responding.

```
summary(lm(n_NM_resp ~ abs(pitch_change)*abs(rhythm_change), data_Intact))
```

```
##
## Call:
## lm(formula = n_NM_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_Intact)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.8817 -0.6746 -0.5836  0.3555  4.2874
##
## Coefficients:
##                                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         0.569983   0.074745   7.626 9.04e-14 ***
## abs(pitch_change)                   0.018103   0.016593   1.091    0.276
## abs(rhythm_change)                  0.051420   0.034678   1.483    0.139
## abs(pitch_change):abs(rhythm_change) -0.007798   0.008673  -0.899    0.369
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9028 on 627 degrees of freedom
## Multiple R-squared:  0.004061,   Adjusted R-squared:  -0.0007039
## F-statistic: 0.8523 on 3 and 627 DF,  p-value: 0.4657
```

For non-musicians, pitch and rhythm explain 0% of the variance in number of participants responding.

8B

```
summary(lm(n_M_resp ~ abs(pitch_change)*abs(rhythm_change), data_8B))
```

```
##
## Call:
## lm(formula = n_M_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_8B)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.6960 -0.4178 -0.3951  0.5452  5.5608
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         0.448083   0.069643   6.434 2.47e-10 ***
## abs(pitch_change)                  -0.026505   0.014681  -1.805   0.0715 .
## abs(rhythm_change)                 -0.040398   0.031639  -1.277   0.2021
## abs(pitch_change):abs(rhythm_change)  0.028164   0.006488   4.341 1.65e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8472 on 628 degrees of freedom
## Multiple R-squared:  0.04647,    Adjusted R-squared:  0.04192
## F-statistic:  10.2 on 3 and 628 DF,  p-value: 1.443e-06
```

For musicians, pitch and rhythm explain 4.2% of the variance in number of participants responding.

```
summary(lm(n_NM_resp ~ abs(pitch_change)*abs(rhythm_change), data_8B))
```

```
##
## Call:
## lm(formula = n_NM_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_8B)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.1975 -0.5755 -0.5225  0.4371  6.4452
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                         0.576088   0.079966   7.204 1.68e-12 ***
## abs(pitch_change)                  -0.007931   0.016857  -0.470  0.63817
## abs(rhythm_change)                 -0.040288   0.036329  -1.109  0.26786
## abs(pitch_change):abs(rhythm_change)  0.020575   0.007450   2.762  0.00592 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9727 on 628 degrees of freedom
## Multiple R-squared:  0.02444,    Adjusted R-squared:  0.01978
## F-statistic: 5.244 on 3 and 628 DF,  p-value: 0.001402
```

For non-musicians, pitch and rhythm explain 2.0% of the variance in number of participants responding.

2B

```
summary(lm(n_M_resp ~ abs(pitch_change)*abs(rhythm_change), data_2B))
```

```
##
## Call:
## lm(formula = n_M_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_2B)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -2.0504 -0.7498 -0.5490  0.3078  5.2600
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.747526   0.086381   8.654  < 2e-16 ***
## abs(pitch_change)                  0.001140   0.016121   0.071  0.94365
## abs(rhythm_change)                -0.049643   0.036418  -1.363  0.17332
## abs(pitch_change):abs(rhythm_change)  0.018297   0.006639   2.756  0.00602 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.001 on 632 degrees of freedom
## Multiple R-squared:  0.03602,    Adjusted R-squared:  0.03144
## F-statistic: 7.871 on 3 and 632 DF,  p-value: 3.665e-05
```

For musicians, pitch and rhythm explain 3.1% of the variance in number of participants responding.

```
summary(lm(n_NM_resp ~ abs(pitch_change)*abs(rhythm_change), data_2B))
```

```
##
## Call:
## lm(formula = n_NM_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_2B)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.5275 -0.7233 -0.2390  0.3311  4.8278
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.591059   0.090807   6.509 1.54e-10 ***
## abs(pitch_change)                  0.032451   0.016947   1.915    0.056 .
## abs(rhythm_change)                 0.027263   0.038284   0.712    0.477
## abs(pitch_change):abs(rhythm_change) 0.006184   0.006979   0.886    0.376
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.053 on 632 degrees of freedom
## Multiple R-squared:  0.03849,    Adjusted R-squared:  0.03393
## F-statistic: 8.434 on 3 and 632 DF,  p-value: 1.677e-05
```

For non-musicians, pitch and rhythm explain 3.4% of the variance in number of participants responding.

1B

```
summary(lm(n_M_resp ~ abs(pitch_change)*abs(rhythm_change), data_1B))
```

```
##
## Call:
## lm(formula = n_M_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_1B)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.1716 -0.7921 -0.1288  0.2597  4.2422
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.749937   0.084925   8.831   <2e-16 ***
## abs(pitch_change)                  0.016087   0.013609   1.182    0.238
## abs(rhythm_change)                -0.017238   0.033571  -0.513    0.608
## abs(pitch_change):abs(rhythm_change)  0.002503   0.004893   0.511    0.609
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.023 on 635 degrees of freedom
## Multiple R-squared:  0.009207,   Adjusted R-squared:  0.004526
## F-statistic: 1.967 on 3 and 635 DF,  p-value: 0.1177
```

For musicians, pitch and rhythm explain 0.45% of the variance in number of participants responding.

```
summary(lm(n_NM_resp ~ abs(pitch_change)*abs(rhythm_change), data_1B))
```

```
##
## Call:
## lm(formula = n_NM_resp ~ abs(pitch_change) * abs(rhythm_change),
##     data = data_1B)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.0976 -0.8953  0.0692  0.1803  4.0940
##
## Coefficients:
##                                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)                        0.819670   0.082346   9.954   <2e-16 ***
## abs(pitch_change)                  0.018670   0.013196   1.415    0.158
## abs(rhythm_change)                 0.031336   0.032552   0.963    0.336
## abs(pitch_change):abs(rhythm_change) -0.006442   0.004745  -1.358    0.175
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.9921 on 635 degrees of freedom
## Multiple R-squared:  0.003458,   Adjusted R-squared:  -0.00125
## F-statistic: 0.7345 on 3 and 635 DF,  p-value: 0.5317
```

For non-musicians, pitch and rhythm explain 0% of the variance in number of participants responding.