Chi Squared Analysis Against Gender

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Methods

A Chi-Squared test was run against "bucketed gender" and all other independent variables. Bucketed gender was created by combining transgender and nonbinary or gender non-conforming participants into one category labelled "transgender and nonbinary". This was done so that there would be enought datapoints in each category for a chi-squared test to be reliably performed. Here are the counts for each category of bucketed gender:

```
table(clean_dat$bucketed_gender)
```

```
##
##    female      male nonbinary
##       132       287         8
```

Significant Results

The following variables were shown to have a significant relationship with gender.

```
sig = get_sig(subset_cd)
sig_subset = subset_cd[,sig]
make_table_chi_df(sig_subset)
```

```
## [1] "composer with Gender"
## [1] "Contingency Table"
##    female male nonbinary
##
## 1      29  116         2
## 2     102  163         6
## [1] "Results in Percent of Participants"
##    female   male nonbinary
##
## 1  22.137 41.577    25.000
## 2  77.863 58.423    75.000
## [1] "Chi-Squared Test"
```

```
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 15.145, df = 2, p-value = 0.0005144
##
## [1] "arranger with Gender"
## [1] "Contingency Table"
##    female male nonbinary
##
## 1      39  168         3
```

```
## 2      90  113         5
## [1] "Results in Percent of Participants"
##    female   male nonbinary
##
## 1  30.233 59.786    37.500
## 2  69.767 40.214    62.500
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 31.419, df = 2, p-value = 1.505e-07
##
## [1] "tour.ever with Gender"
## [1] "Contingency Table"
##    female male nonbinary
##
## 1      53  194         2
## 2      71   82         6
## [1] "Results in Percent of Participants"
##    female   male nonbinary
##
## 1  42.742 70.290    25.000
## 2  57.258 29.710    75.000
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 31.754, df = 2, p-value = 1.272e-07
##
## [1] "bucketed_gender with Gender"
## [1] "Contingency Table"
##            female male nonbinary
##
## female        132    0         0
## male            0  287         0
## nonbinary       0    0         8
## [1] "Results in Percent of Participants"
##            female male nonbinary
##
## female        100    0         0
## male            0  100         0
## nonbinary       0    0       100
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
```

```
## data:  tab
## X-squared = 854, df = 4, p-value < 2.2e-16
```

Instrument Choice with Gender

The following shows the instruments,that have some significant relationship with gender.Each of these instruments was tested individually against gender :

piano, keyboard, flute,clarinet,piccolo,oboe,trumpet,flugelhorn,saxaphone-write in,trombone,tuba,french horn,violin,viola,cello,acoustic bass,electric bass,acoustic guitar,electric guitar,harp,drums, percussion

```
#For Instruments
master_chi_instrument(colStart=31,colEnd=53,df=poi,gender_column="bucketed_gender")
```

```
## [1] "Q: Do you play  piano  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      197  583        16
## Yes      60  101         3
## [1] "Results in Percent of Participants"
##      female   male nonbinary
##
## No   76.654 85.234    84.211
## Yes  23.346 14.766    15.789
## [1] "Chi-Squared Test"
```

```
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 9.7321, df = 2, p-value = 0.007704
##
## [1] "Q: Do you play  electric guitar  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      254  652        19
## Yes       3   32         0
## [1] "Results in Percent of Participants"
##       female    male nonbinary
##
## No    98.833  95.322   100.000
## Yes    1.167   4.678     0.000
## [1] "Chi-Squared Test"
```

```
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 7.2889, df = 2, p-value = 0.02614
##
```

```
## [1] "Q: Do you play  french horn  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      249  680        19
## Yes       8    4         0
## [1] "Results in Percent of Participants"
##       female    male nonbinary
##
## No    96.887  99.415   100.000
## Yes    3.113   0.585     0.000
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 9.9175, df = 2, p-value = 0.007022
##
## [1] "Q: Do you play  violin  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      244  674        19
## Yes      13   10         0
## [1] "Results in Percent of Participants"
##       female    male nonbinary
##
## No    94.942  98.538   100.000
## Yes    5.058   1.462     0.000
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 10.808, df = 2, p-value = 0.004498
##
## [1] "Q: Do you play  trumpet  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      255  657        18
## Yes       2   27         1
## [1] "Results in Percent of Participants"
##      female   male nonbinary
##
## No   99.222 96.053    94.737
## Yes   0.778  3.947     5.263
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
```

```
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 6.4904, df = 2, p-value = 0.03896
##
## [1] "Q: Do you play  cello  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      247  677        19
## Yes      10    7         0
## [1] "Results in Percent of Participants"
##       female    male nonbinary
##
## No    96.109  98.977   100.000
## Yes    3.891   1.023     0.000
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 9.181, df = 2, p-value = 0.01015
##
## [1] "Q: Do you play  trombone  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      256  657        19
## Yes       1   27         0
## [1] "Results in Percent of Participants"
##       female    male nonbinary
##
## No    99.611  96.053   100.000
## Yes    0.389   3.947     0.000
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 8.9354, df = 2, p-value = 0.01147
```

Instrument Families

the following groupings were made and tested against bucketed gender. All were significant:

Strings : violin, viola, acoustic bass, cello

Brass : trumpet, flugelhorn, trombone, tuba, frenchhorn

Woodwinds: flute, clarinet, piccolo, oboe, saxophone

Rhythm: acoustic guitar, electric guitar, electric bass, drums, percussion

piano or keyboard

```
master_chi_instrument(colStart=54,colEnd=58,df=poi,gender_column="bucketed_gender")
```

```
## [1] "Q: Do you play  string  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      219  639        19
## Yes      38   45         0
## [1] "Results in Percent of Participants"
##       female    male nonbinary
##
## No    85.214  93.421   100.000
## Yes   14.786   6.579     0.000
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 17.765, df = 2, p-value = 0.0001388
##
## [1] "Q: Do you play  brass  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      242  598        18
## Yes      15   86         1
## [1] "Results in Percent of Participants"
##      female   male nonbinary
##
## No   94.163 87.427    94.737
## Yes   5.837 12.573     5.263
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 9.5143, df = 2, p-value = 0.00859
##
## [1] "Q: Do you play  wwind  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      206  539        10
## Yes      51  145         9
## [1] "Results in Percent of Participants"
##      female   male nonbinary
```

```
##
## No   80.156 78.801    52.632
## Yes  19.844 21.199    47.368
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 8.0149, df = 2, p-value = 0.01818
##
## [1] "Q: Do you play  rhythm  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      223  510        15
## Yes      34  174         4
## [1] "Results in Percent of Participants"
##      female   male nonbinary
##
## No   86.770 74.561    78.947
## Yes  13.230 25.439    21.053
## [1] "Chi-Squared Test"
## Warning in chisq.test(tab): Chi-squared approximation may be incorrect
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 16.195, df = 2, p-value = 0.0003043
##
## [1] "Q: Do you play  piano_or_keyboard  at a professional level?"
## [1] "Contingency Table"
##      female male nonbinary
##
## No      152  495        15
## Yes     105  189         4
## [1] "Results in Percent of Participants"
##      female   male nonbinary
##
## No   59.144 72.368    78.947
## Yes  40.856 27.632    21.053
## [1] "Chi-Squared Test"
##
##  Pearson's Chi-squared test
##
## data:  tab
## X-squared = 16.166, df = 2, p-value = 0.0003087
```