

FCTM_LabEx

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```
knitr::opts_chunk$set(echo = TRUE)
knitr::opts_knit$set(root.dir = 'C:/Users/larn_/OneDrive - Louisiana State University/R/FCTM_Bx_v1')
```

The FCTM_bx_v1 study consists of two tasks in which participants both view and imagine two Gabor patches in each set. In Set A (Imagery Acquisition), participants view and imagine a left-ward and vertical patch, and are fear conditioned when imagining one of these patches. In Set B (Visual Acquisition), participants view and imagine a right-ward and horizontal patch, and are fear conditioned when viewing one of these patches. These sets will be discussed in reverse (Set B: Visual Acquisition then Set A: Imagery Acquisition) for ease of understanding.

These tasks allow for the investigation of 5 questions:

1. To determine if participants fear condition to a viewed stimulus
2. To determine if participants generalize this fear of a viewed stimulus to the corresponding imagined stimulus
3. To determine if participants fear condition to an imagined stimulus
4. To determine if participants generalize this fear to the corresponding viewed stimulus
5. To determine if the fear acquired when viewing a stimulus is of similar magnitude to the fear acquired when imagining a stimulus

This markdown is primarily to be used in order to determine which results to include in the main vs supplemental parts of the publication. Contact L for questions: lburle2@lsu.edu or lburleigh09@gmail.com

Likert-Style Questionnaire

Descriptive Statistics

Visual Acquisition (Set B)

##	B_vivid_Cspi	B_vivid_Csmi	B_effort_Cspi	B_effort_Csmi	B_fear_Cspi
## nbr.val	33.0000000	33.0000000	33.0000000	33.0000000	33.0000000
## nbr.null	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## nbr.na	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## min	2.0000000	3.0000000	2.0000000	2.0000000	1.0000000
## max	7.0000000	7.0000000	7.0000000	7.0000000	7.0000000
## range	5.0000000	4.0000000	5.0000000	5.0000000	6.0000000
## sum	164.0000000	166.0000000	162.0000000	159.0000000	101.0000000
## median	5.0000000	5.0000000	5.0000000	5.0000000	2.0000000
## mean	4.9696970	5.0303030	4.9090909	4.8181818	3.0606061
## SE.mean	0.2518299	0.2153435	0.2931143	0.2517159	0.3341072
## CI.mean.0.95	0.5129606	0.4386403	0.5970542	0.5127285	0.6805542
## var	2.0928030	1.5303030	2.8352273	2.0909091	3.6837121

## std.dev	1.4466524	1.2370542	1.6838133	1.4459976	1.9192999
## coef.var	0.2910947	0.2459204	0.3429990	0.3001127	0.6270980
##	B_fear_Csmi	B_fear_Cspv	B_fear_Csmv		
## nbr.val	33.0000000	33.0000000	33.0000000		
## nbr.null	0.0000000	0.0000000	0.0000000		
## nbr.na	0.0000000	0.0000000	0.0000000		
## min	1.0000000	1.0000000	1.0000000		
## max	5.0000000	7.0000000	6.0000000		
## range	4.0000000	6.0000000	5.0000000		
## sum	78.0000000	148.0000000	81.0000000		
## median	2.0000000	5.0000000	2.0000000		
## mean	2.3636364	4.4848485	2.4545455		
## SE.mean	0.2336234	0.3538779	0.2856774		
## CI.mean.0.95	0.4758753	0.7208257	0.5819058		
## var	1.8011364	4.1325758	2.6931818		
## std.dev	1.3420642	2.0328738	1.6410917		
## coef.var	0.5677964	0.4532759	0.6685929		

Imagery Acquisition (Set A)

##	A_vivid_Cspi	A_vivid_Csmi	A_effort_Cspi	A_effort_Csmi	A_fear_Cspi
## nbr.val	33.0000000	33.0000000	33.0000000	33.0000000	33.0000000
## nbr.null	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## nbr.na	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
## min	2.0000000	2.0000000	2.0000000	2.0000000	1.0000000
## max	7.0000000	7.0000000	7.0000000	7.0000000	7.0000000
## range	5.0000000	5.0000000	5.0000000	5.0000000	6.0000000
## sum	160.0000000	167.0000000	162.0000000	161.0000000	151.0000000
## median	5.0000000	5.0000000	5.0000000	5.0000000	5.0000000
## mean	4.8484848	5.0606061	4.9090909	4.8787879	4.5757576
## SE.mean	0.2790718	0.2381248	0.2931143	0.2565711	0.3427559
## CI.mean.0.95	0.5684507	0.4850442	0.5970542	0.5226183	0.6981710
## var	2.5700758	1.8712121	2.8352273	2.1723485	3.8768939
## std.dev	1.6031456	1.3679226	1.6838133	1.4738889	1.9689830
## coef.var	0.3306488	0.2703081	0.3429990	0.3021015	0.4303075
##	A_fear_Csmi	A_fear_Cspv	A_fear_Csmv		
## nbr.val	33.0000000	33.0000000	33.0000000		
## nbr.null	0.0000000	0.0000000	0.0000000		
## nbr.na	0.0000000	0.0000000	0.0000000		
## min	1.0000000	1.0000000	1.0000000		
## max	5.0000000	6.0000000	6.0000000		
## range	4.0000000	5.0000000	5.0000000		
## sum	77.0000000	88.0000000	73.0000000		
## median	2.0000000	2.0000000	2.0000000		
## mean	2.3333333	2.6666667	2.2121212		
## SE.mean	0.2330084	0.3097735	0.2413566		
## CI.mean.0.95	0.4746226	0.6309879	0.4916272		
## var	1.7916667	3.1666667	1.9223485		
## std.dev	1.3385315	1.7795130	1.3864878		
## coef.var	0.5736564	0.6673174	0.6267685		

Analyses

Subjective Fear ANOVA

Warning: Converting "Subject_ID" to factor for ANOVA.

Warning: Converting "CS" to factor for ANOVA.

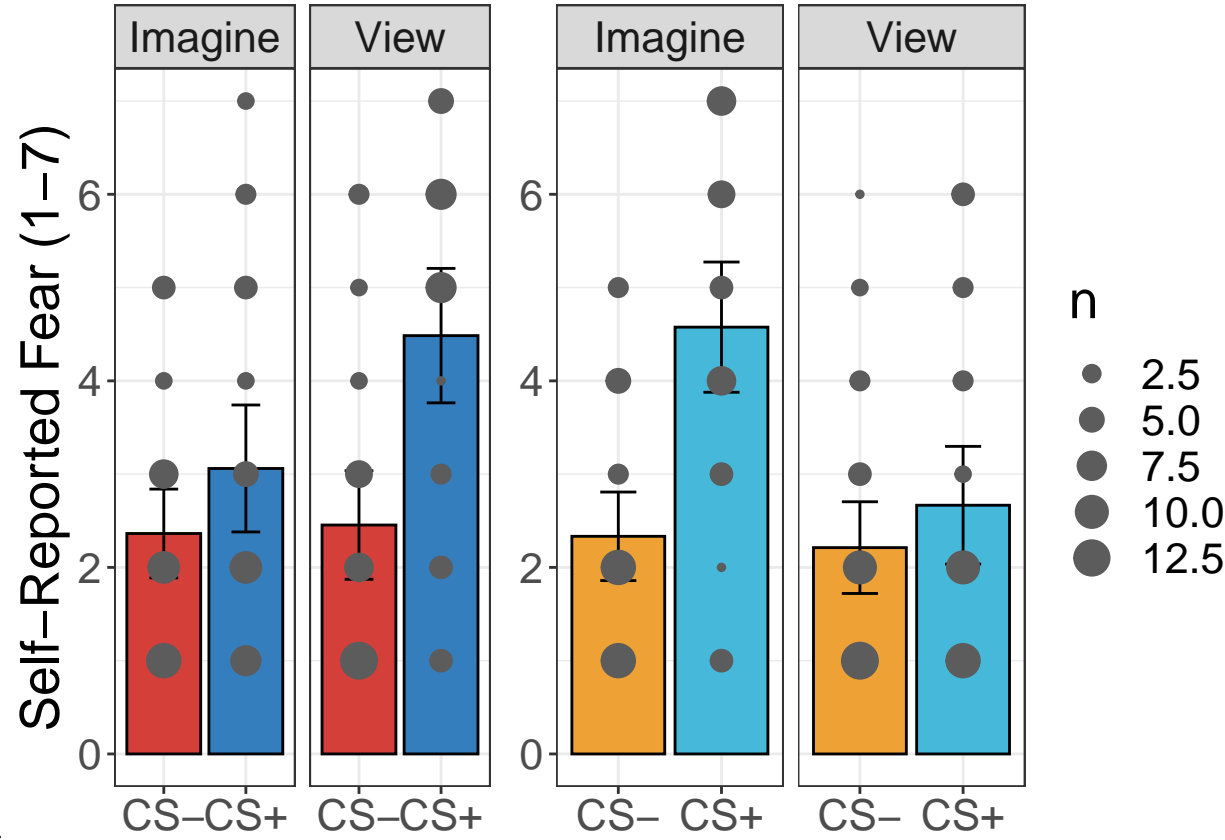
Warning: Converting "Percept" to factor for ANOVA.

Warning: Converting "Phase" to factor for ANOVA.

\$ANOVA

##	Effect	DFn	DFd	SSn	SSd	F	p
## 1	(Intercept)	1	32	2.406095e+03	272.03030	2.830384e+02	1.889652e-17
## 2	CS	1	32	1.213674e+02	107.25758	3.620963e+01	1.032002e-06
## 3	Percept	1	32	1.094697e+00	62.03030	5.647289e-01	4.578527e-01
## 4	Phase	1	32	1.367424e+00	67.75758	6.457961e-01	4.275491e-01
## 5	CS:Percept	1	32	8.522727e-01	48.77273	5.591799e-01	4.600513e-01
## 6	CS:Phase	1	32	3.787879e-03	26.62121	4.553216e-03	9.466214e-01
## 7	Percept:Phase	1	32	5.185227e+01	101.27273	1.638420e+01	3.062097e-04
## 8	CS:Percept:Phase	1	32	4.018561e+01	52.43939	2.452239e+01	2.284507e-05
##	p<.05		ges				
## 1	*		7.652300e-01				
## 2	*		1.411989e-01				
## 3			1.480768e-03				
## 4			1.848997e-03				
## 5			1.153225e-03				
## 6			5.131337e-06				
## 7	*		6.563296e-02				
## 8	*		5.162807e-02				

Visualization



lik graph-1.pdf

Three-way ANOVA Self-Report Follow-up tests

Visual Acquisition Primary Analyses (Set B)

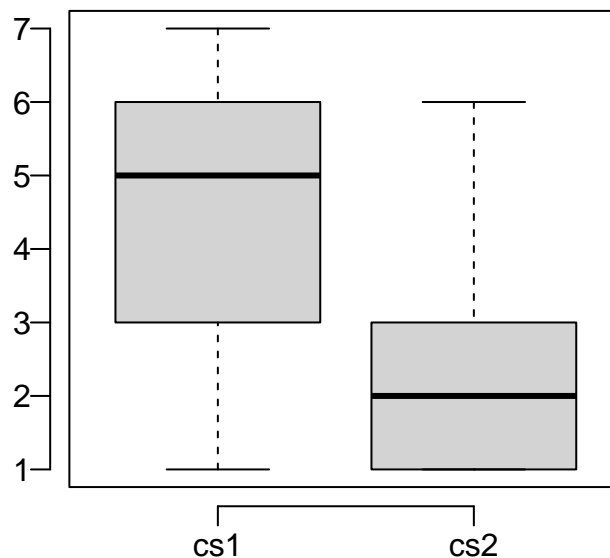
Fear View

```
t.test(data ~ groups, data = subset(longB, groups %in% c("B_fear_Cspv", "B_fear_Csmv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -4.4791, df = 32, p-value = 8.965e-05
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -2.953606 -1.107000
## sample estimates:
## mean difference
## -2.030303

cohens_d(longB$data[longB$groups == "B_fear_Cspv"], longB$data[longB$groups == "B_fear_Csmv"], paired = TRUE)

## Cohen's d | 95% CI
## -----
## 0.78 | [0.38, 1.17]
```



Bayesian Test

```
## $descriptives
```

```

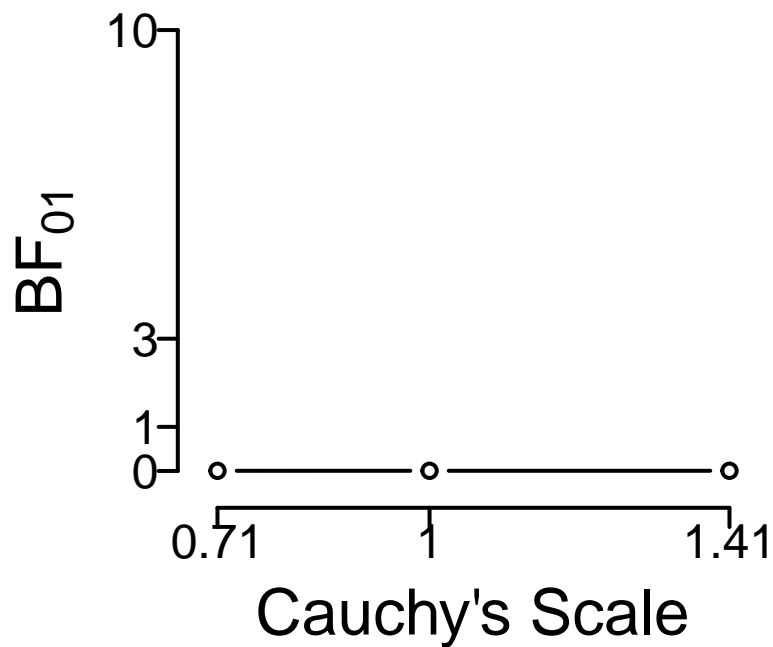
##      vars  n mean   sd min max range   se
## cs1     1 33 4.48 2.03   1   7    6 0.35
## cs2     2 33 2.45 1.64   1   6    5 0.29
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value  LCI
## 1 Paired t-test  two.sided 0.9251797 0.02555853   0   0         0 1.107
##      HCI t.statistic df      p.value   cohenD cohenDM  hedgesG hedgesGM
## 1 2.953606    4.479126 32 8.964563e-05 1.098922   large 1.072963   large
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01   propError
## 1 -Inf Inf  0.707 280.8062 0.003561175 3.043136e-07
##
## attr("class")
## [1] "csCompare"

## [1] "extreme evidence (BF = 280.81) in favour of"
## (Rules: jeffreys1961)

Sensitivity + Robustness

## $res
##      nG1 nG2  LNI HNI rscale      bf10      bf01
## 1  33   0 -Inf Inf  0.707 280.806190496495 0.00356117505184589
## 2  33   0 -Inf Inf      1 266.800106115707 0.00374812444627108
## 3  33   0 -Inf Inf  1.41 230.723352468553 0.00433419499717219
##
##      propError
## 1 3.04313613527366e-07
## 2 3.53957507961681e-07
## 3 3.37386963451425e-07
##
## attr("class")
## [1] "csSensitivity"

```



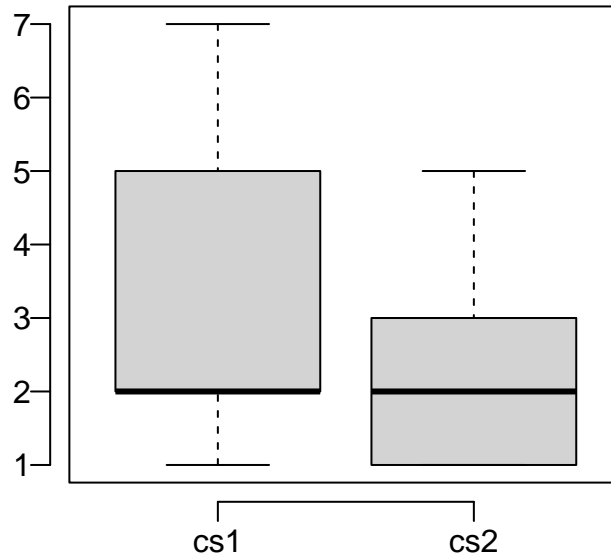
Generalized Fear to Imagine

```
t.test(data ~ groups, data = subset(longB, groups %in% c("B_fear_Cspi", "B_fear_Csmi")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -2.232, df = 32, p-value = 0.03274
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -1.33303188 -0.06090751
## sample estimates:
## mean difference
## -0.6969697

cohens_d(longB$data[longB$groups == "B_fear_Cspi"], longB$data[longB$groups == "B_fear_Csmi"], paired =

## Cohen's d | 95% CI
## -----
## 0.39 | [0.03, 0.74]
```



Bayesian Test

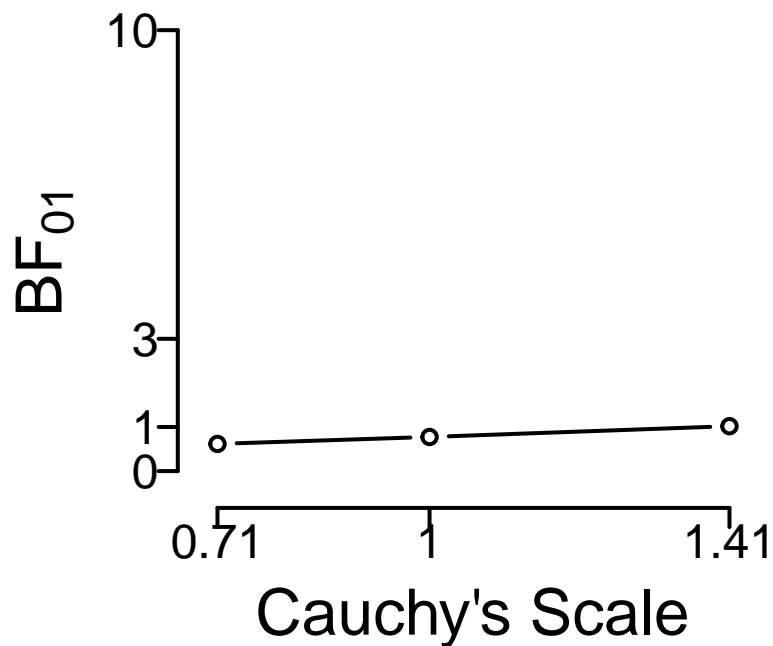
```
## $descriptives
##      vars  n mean   sd min max range   se
## cs1     1 33 3.06 1.92   1  7    6 0.33
## cs2     2 33 2.36 1.34   1  5    4 0.23
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test    two.sided 0.793142 2.394827e-05  0  0        0
##      LCI      HCI t.statistic df    p.value    cohenD cohenDM  hedgesG
## 1 0.06090751 1.333032    2.231984 32 0.03274349 0.4111678  small 0.4014551
##  hedgesGM
## 1    small
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01    propError
## 1 -Inf Inf  0.707 1.622787 0.6162237 0.0001859342
##
## attr(,"class")
## [1] "csCompare"
##
## [1] "anecdotal evidence (BF = 1.62) in favour of"
## (Rules: jeffreys1961)
```

Sensitivity + Robustness

```
## $res
##      nG1 nG2  LNI HNI rscale      bf10      bf01
## 1   33   0 -Inf Inf  0.707 1.62278717961782 0.616223749213688
```



```
## 2 33 0 -Inf Inf 1 1.29281848714961 0.773503790315366
## 3 33 0 -Inf Inf 1.41 0.984785121542461 1.0154499475314
##      propError
## 1 0.000185934207414633
## 2 1.69651064438194e-08
## 3 1.97707010967083e-08
##
## attr("class")
## [1] "csSensitivity"
```



Imagery Acquisition Primary Analyses (Set A)

Fear Imagine

```
t.test(data ~ groups, data = subset(longA, groups %in% c("A_fear_Cspi", "A_fear_Csmi")), paired=TRUE)
```

```
##
## Paired t-test
##
## data: data by groups
## t = -6.4393, df = 32, p-value = 3.061e-07
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -2.951761 -1.533087
## sample estimates:
## mean difference
```

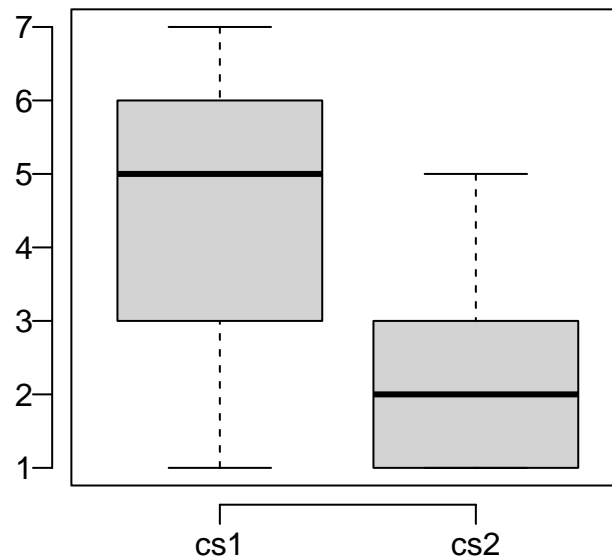
```
##          -2.242424
```

```
cohens_d(longA$data[longA$groups == "A_fear_Cspi"], longA$data[longA$groups == "A_fear_Csmi"], paired =
```

```
## Cohen's d |          95% CI
```

```
## -----
```

```
## 1.12      | [0.68, 1.55]
```



Bayesian Test

```
## $descriptives
```

```
##      vars  n mean  sd min max range  se
```

```
## cs1     1 33 4.58 1.97  1  7    6 0.34
```

```
## cs2     2 33 2.33 1.34  1  5    4 0.23
```

```
##
```

```
## $freq.results
```

```
##      method alternative      WG1      WpG1 WG2 WpG2 null.value      LCI
```

```
## 1 Paired t-test    two.sided 0.9294513 0.03375783  0  0          0 1.533087
```

```
##      HCI t.statistic df      p.value  cohenD cohenDM  hedgesG hedgesGM
```

```
## 1 2.951761    6.439349 32 3.061132e-07 1.310894   large 1.279928   large
```

```
##
```

```
## $bayes.results
```

```
##      LNI HNI rscale    bf10      bf01  propError
```

```
## 1 -Inf Inf  0.707 52548.2 1.903015e-05 3.004318e-12
```

```
##
```

```
## attr(,"class")
```

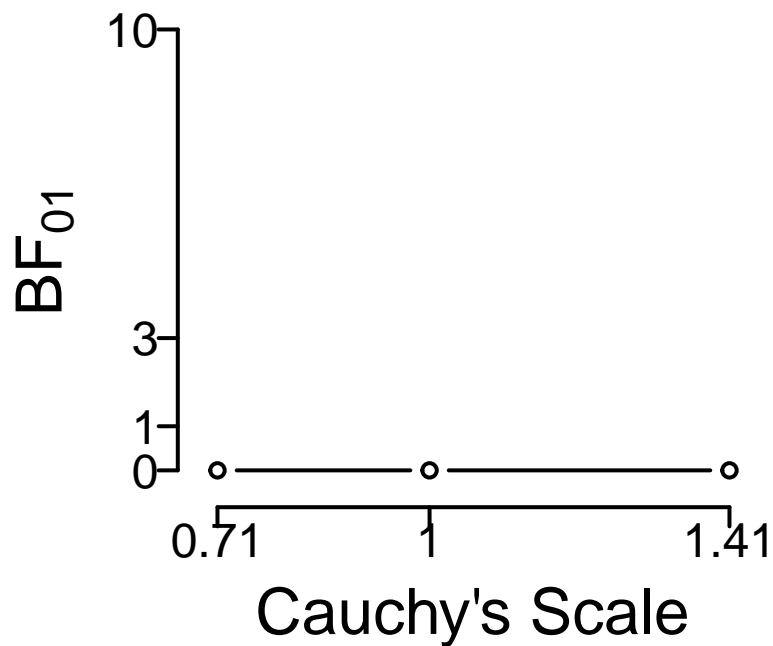
```
## [1] "csCompare"
```

```
## [1] "extreme evidence (BF = 5.25e+04) in favour of"
```

```
## (Rules: jeffreys1961)
```

Sensitivity + Robustness

```
## $res
##   nG1 nG2  LNI HNI rscale          bf10          bf01
## 1  33   0 -Inf Inf  0.707 52548.197307836 1.9030148534722e-05
## 2  33   0 -Inf Inf      1 56488.5819309272 1.77026925764002e-05
## 3  33   0 -Inf Inf  1.41 54555.1887998999 1.83300621260399e-05
##           propError
## 1 3.00431764681314e-12
## 2 1.50488904146926e-12
## 3 9.94340080801168e-13
##
## attr("class")
## [1] "csSensitivity"
```



Generalized Fear to View

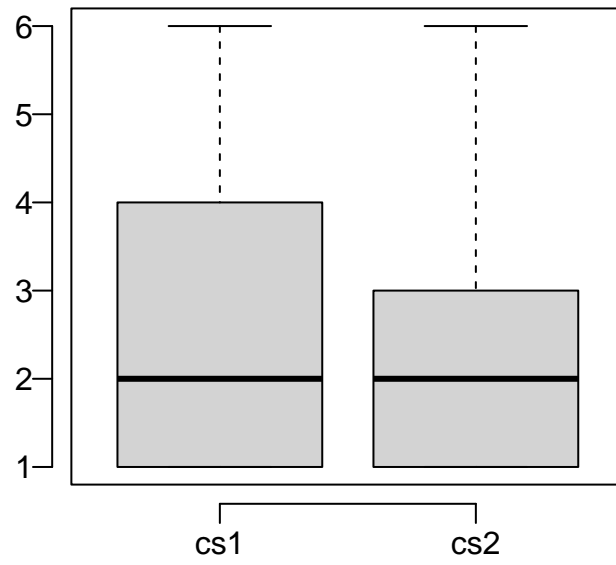
```
t.test(data ~ groups, data = subset(longA, groups %in% c("A_fear_Cspv", "A_fear_Csmv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -3.1363, df = 32, p-value = 0.003657
## alternative hypothesis: true mean difference is not equal to 0
```

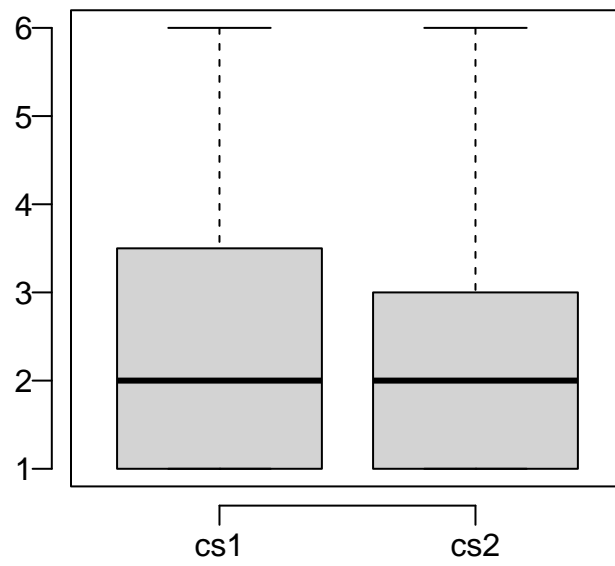
```
## 95 percent confidence interval:  
## -0.7497639 -0.1593270  
## sample estimates:  
## mean difference  
## -0.4545455
```

```
cohens_d(longA$data[longA$groups == "A_fear_Cspv"], longA$data[longA$groups == "A_fear_Csmv"], paired =
```

```
## Cohen's d |          95% CI  
## -----  
## 0.55      | [0.18, 0.91]
```

Bayesian Test



```

## $descriptives
##      vars  n mean   sd min max range   se
## cs1     1 33 2.67 1.78   1   6     5 0.31
## cs2     2 33 2.21 1.39   1   6     5 0.24
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value      LCI
## 1 Paired t-test   two.sided 0.6015211 2.828705e-08   0   0         0 0.159327
##      HCI t.statistic df      p.value      cohenD cohenDM  hedgesG hedgesGM
## 1 0.7497639      3.13625 32 0.003656919 0.2551079   small 0.2490817   small
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01 propError
## 1 -Inf Inf  0.707 10.34936 0.09662434 9.9539e-10
##
## $res.out
## $descriptives
##      vars  n mean   sd min max range   se
## cs1     1 31 2.48 1.67   1   6     5 0.30
## cs2     2 31 2.19 1.42   1   6     5 0.26
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test   two.sided 0.5845287 3.376156e-08   0   0         0
##      LCI      HCI t.statistic df      p.value      cohenD      cohenDM hedgesG
## 1 0.09637783 0.4842673      3.057148 30 0.004665782 0.1664779 negligible 0.162281
##      hedgesGM
## 1 negligible
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01 propError
## 1 -Inf Inf  0.707 8.548588 0.1169784 1.293245e-09
##
## attr("class")
## [1] "csCompare"
##
## attr("class")
## [1] "csCompare"

## [1] "strong evidence (BF = 10.35) in favour of"
## (Rules: jeffreys1961)

```

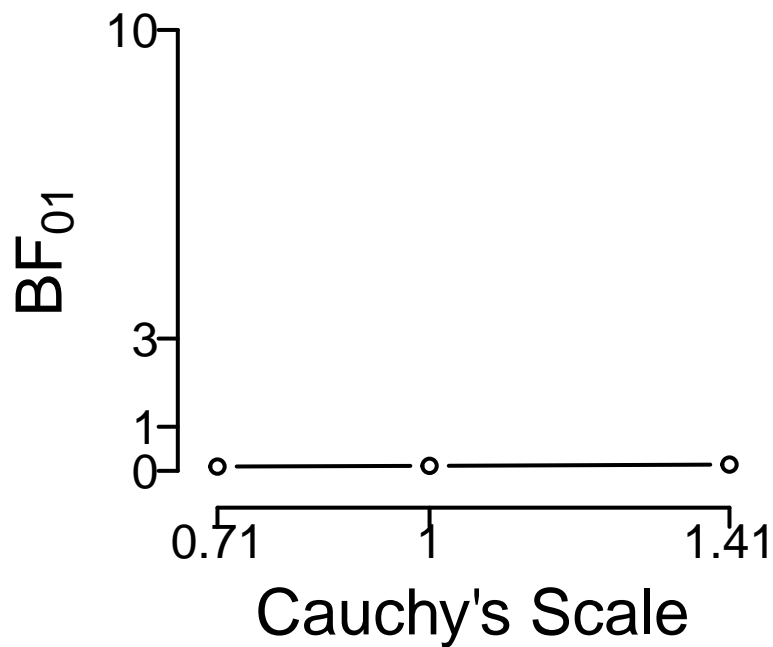
Sensitivity + Robustness

```

## $res
##      nG1 nG2 LNI HNI rscale      bf10      bf01
## 1 33   0 -Inf Inf  0.707 10.349358983023 0.0966243418206275
## 2 33   0 -Inf Inf      1 8.84874692330823 0.113010351484449
## 3 33   0 -Inf Inf  1.41 7.0683292226761 0.141476149242154
##      propError
## 1 9.95390028802968e-10
## 2 1.03014526814866e-09
## 3 1.15902247102876e-09
##
## $res.out

```

```
##      nG1 nG2  LNI HNI rscale          bf10          bf01
## 1   31   0 -Inf Inf   0.707  8.5485881776906 0.116978380431253
## 2   31   0 -Inf Inf       1 7.31384226102562 0.136727039538281
## 3   31   0 -Inf Inf   1.41 5.84778256346069 0.171004990207468
##              propError
## 1 1.29324500169085e-09
## 2 1.26294918406648e-09
## 3 1.39318598105941e-09
##
## attr(,"class")
## [1] "csSensitivity"
```



Visual Acquisition Additional follow-ups (Set B)

CS+s

```
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("B_fear_Cspi", "B_fear_Cspv")), paired=TRUE)
```

```
##
## Paired t-test
##
## data: data by groups
## t = -3.1487, df = 32, p-value = 0.003541
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -2.3456094 -0.5028754
```



```
## sample estimates:
## mean difference
##      -1.424242

cohens_d(longCSVlik$data[longCSVlik$groups == "B_fear_Cspi"], longCSVlik$data[longCSVlik$groups == "B_fear_Csmv"])

## Cohen's d |          95% CI
## -----
## -0.55      | [-0.91, -0.18]

CS-s

t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("B_fear_Csmi", "B_fear_Csmv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -0.36165, df = 32, p-value = 0.72
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  -0.6029404  0.4211223
## sample estimates:
## mean difference
##      -0.09090909

cohens_d(longCSVlik$data[longCSVlik$groups == "B_fear_Csmi"], longCSVlik$data[longCSVlik$groups == "B_fear_Csmv"])

## Cohen's d |          95% CI
## -----
## -0.06      | [-0.40, 0.28]
```

Imagery Acquisition Additional follow-ups (Set A)

CS+s

```
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Cspv", "A_fear_Cspi")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 4.4231, df = 32, p-value = 0.0001053
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  1.029912 2.788270
## sample estimates:
## mean difference
##      1.909091

cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Cspv"], longCSVlik$data[longCSVlik$groups == "A_fear_Cspi"])

## Cohen's d |          95% CI
## -----
## -0.77      | [-1.15, -0.38]
```

CS-s

```
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Csmv", "A_fear_Csmi")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 0.55977, df = 32, p-value = 0.5795
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.3198644 0.5622886
## sample estimates:
## mean difference
## 0.1212121

cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Csmv"], longCSVlik$data[longCSVlik$groups == "A_fear_Csmi"])

## Cohen's d |          95% CI
## -----
## -0.10      | [-0.44, 0.25]
```

Across Phase Analyses

CS+s

Acquiring fear to an imagined vs a viewed stimulus

```
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Cspi", "B_fear_Cspv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 0.27343, df = 32, p-value = 0.7863
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.5863129 0.7681310
## sample estimates:
## mean difference
## 0.09090909

cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Cspi"], longCSVlik$data[longCSVlik$groups == "B_fear_Cspv"])

## Cohen's d |          95% CI
## -----
## 0.05       | [-0.29, 0.39]
```

Generalized fear to an imagined vs a viewed stimulus

```
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("B_fear_Cspi", "A_fear_Cspv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -1.1064, df = 32, p-value = 0.2768
## alternative hypothesis: true mean difference is not equal to 0
```

```

## 95 percent confidence interval:
## -1.1192111 0.3313323
## sample estimates:
## mean difference
## -0.3939394
cohens_d(longCSVlik$data[longCSVlik$groups == "B_fear_Cspi"], longCSVlik$data[longCSVlik$groups == "A_fear_Cspi"])

## Cohen's d |          95% CI
## -----
## 0.19      | [-0.15, 0.54]

Fear acquired to a viewed stimulus vs fear generalized to a viewed stimulus
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Cspv", "B_fear_Cspv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -4.1075, df = 32, p-value = 0.0002587
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -2.7198249 -0.9165388
## sample estimates:
## mean difference
## -1.818182
cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Cspv"], longCSVlik$data[longCSVlik$groups == "B_fear_Cspv"])

## Cohen's d |          95% CI
## -----
## -0.72     | [-1.09, -0.33]

Fear acquired to an imagined stimulus vs fear generalized to an imagined stimulus
t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Cspi", "B_fear_Cspi")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 4.0996, df = 32, p-value = 0.0002645
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 0.7623311 2.2679719
## sample estimates:
## mean difference
## 1.515152
cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Cspi"], longCSVlik$data[longCSVlik$groups == "B_fear_Cspi"])

## Cohen's d |          95% CI
## -----
## 0.71      | [0.33, 1.09]

```

CS-s

Acquired percept modalities (CS- imagine Set A vs CS- view Set B)

```

t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Csmi", "B_fear_Csmv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -0.43102, df = 32, p-value = 0.6693
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.6940444 0.4516202
## sample estimates:
## mean difference
## -0.1212121

cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Csmi"], longCSVlik$data[longCSVlik$groups == "B_fear_Csmv"])

## Cohen's d |          95% CI
## -----
## -0.08      | [-0.42, 0.27]

Generalized percept modalities (CS- imagine Set B vs CS- view Set A)

t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("B_fear_Csmi", "A_fear_Csmv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -0.56388, df = 32, p-value = 0.5768
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.6988375 0.3958072
## sample estimates:
## mean difference
## -0.1515152

cohens_d(longCSVlik$data[longCSVlik$groups == "B_fear_Csmi"], longCSVlik$data[longCSVlik$groups == "A_fear_Csmv"])

## Cohen's d |          95% CI
## -----
## 0.10       | [-0.24, 0.44]

Viewed CS-s

t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Csmv", "B_fear_Csmv")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -0.76495, df = 32, p-value = 0.4499
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.8879624 0.4031139
## sample estimates:
## mean difference
## -0.2424242

```

```

cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Csmv"], longCSVlik$data[longCSVlik$groups == "B_fear_Csmv"])

## Cohen's d |          95% CI
## -----
## -0.13      | [-0.47, 0.21]

Imagined CS-s

t.test(data ~ groups, data = subset(longCSVlik, groups %in% c("A_fear_Csmi", "B_fear_Csmi")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -0.15774, df = 32, p-value = 0.8756
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.4216017  0.3609956
## sample estimates:
## mean difference
## -0.03030303

cohens_d(longCSVlik$data[longCSVlik$groups == "A_fear_Csmi"], longCSVlik$data[longCSVlik$groups == "B_fear_Csmi"])

## Cohen's d |          95% CI
## -----
## -0.03      | [-0.37, 0.31]

```

Vividness ANOVA

Does the vividness from the self-report questionnaire impact ratings?

```

## Warning: Converting "Subject_ID" to factor for ANOVA.
## Warning: Converting "CS" to factor for ANOVA.
## Warning: Converting "Phase" to factor for ANOVA.

## $ANOVA
##      Effect DFn DFd      SSn      SSd      F      p p<.05
## 1 (Intercept)  1  32 3.270068e+03 174.68182 599.04449649 2.741784e-22 *
## 2          CS   1  32 6.136364e-01  34.13636   0.57523302 4.537371e-01
## 3        Phase  1  32 6.818182e-02  29.68182   0.07350689 7.880389e-01
## 4    CS:Phase  1  32 1.893939e-01  19.56061   0.30983734 5.816523e-01
##          ges
## 1 0.9268562398
## 2 0.0023722361
## 3 0.0002641388
## 4 0.0007333744

```

Vividness t-test

Is the average vividness greater than no visualizations?

```

vivavg <- CSV %>% select("Subject_ID", "B_vivid_Cspi", "B_vivid_Csmi", "A_vivid_Cspi", "A_vivid_Csmi") %>%
  mutate(avg = mean(c(B_vivid_Cspi, B_vivid_Csmi, A_vivid_Cspi, A_vivid_Csmi)))

t.test(vivavg$avg, mu = 1, alternative = "two.sided")

```

```
##
## One Sample t-test
##
## data: vivavg$avg
## t = 19.558, df = 32, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 1
## 95 percent confidence interval:
##  4.563045 5.391500
## sample estimates:
## mean of x
##  4.977273
```

```
cohens_d(vivavg$avg)
```

```
## Cohen's d |          95% CI
## -----
## 4.26      | [3.16, 5.35]
```

Skin Conductance Response (SCR)

Descriptive Statistics

```
##          Subject_ID  GSR_A_cCspv GSR_A_cCsmv GSR_A_cCspi GSR_A_cCsmi
## nbr.val      3.300000e+01 33.000000000 33.00000000 33.00000000 33.00000000
## nbr.null     0.000000e+00 0.000000000 0.00000000 0.00000000 0.00000000
## nbr.na       0.000000e+00 0.000000000 0.00000000 0.00000000 0.00000000
## min         1.601200e+04 0.009273105 0.03164416 0.02105427 0.02742524
## max         1.802000e+04 0.873883703 0.77305455 1.49870061 1.14727643
## range       2.008000e+03 0.864610598 0.74141039 1.47764634 1.11985119
## sum         5.680080e+05 10.473715831 9.44454411 16.47345874 10.81584920
## median      1.723000e+04 0.297898833 0.24113240 0.42100043 0.24920696
## mean        1.721236e+04 0.317385328 0.28619831 0.49919572 0.32775301
## SE.mean     6.544185e+01 0.039322368 0.03599699 0.07260592 0.04195813
## CI.mean.0.95 1.333007e+02 0.080097043 0.07332347 0.14789342 0.08546592
## var         1.413270e+05 0.051026205 0.04276085 0.17396344 0.05809600
## std.dev     3.759348e+02 0.225889807 0.20678697 0.41708925 0.24103112
## coef.var    2.184098e-02 0.711721012 0.72253037 0.83552249 0.73540477
##          GSR_B_cCspv GSR_B_cCsmv GSR_B_cCspi GSR_B_cCsmi
## nbr.val      33.00000000 33.00000000 33.00000000 33.00000000
## nbr.null     0.00000000 0.00000000 0.00000000 1.00000000
## nbr.na       0.00000000 0.00000000 0.00000000 0.00000000
## min         0.01628665 0.03159147 0.01651848 0.00000000
## max         1.90263680 1.65753573 0.95172990 0.88261078
## range       1.88635015 1.62594427 0.93521141 0.88261078
## sum        14.25176658 11.46888586 11.44205783 9.29759570
## median      0.29105229 0.20002862 0.23986407 0.23062781
## mean        0.43187171 0.34754200 0.34672903 0.28174532
## SE.mean     0.07706839 0.06036376 0.04584299 0.03834266
## CI.mean.0.95 0.15698317 0.12295696 0.09337911 0.07810145
## var         0.19600471 0.12024487 0.06935212 0.04851527
## std.dev     0.44272419 0.34676342 0.26334790 0.22026183
## coef.var    1.02512893 0.99775976 0.75952079 0.78177634
```

2x2x2 ANOVA

```
anovatbl <- ezANOVA(data=longfctm.complete, dv = .(data), wid = .(Participant), within = .(CS, Percept,
```

```
## Warning: Converting "Participant" to factor for ANOVA.
```

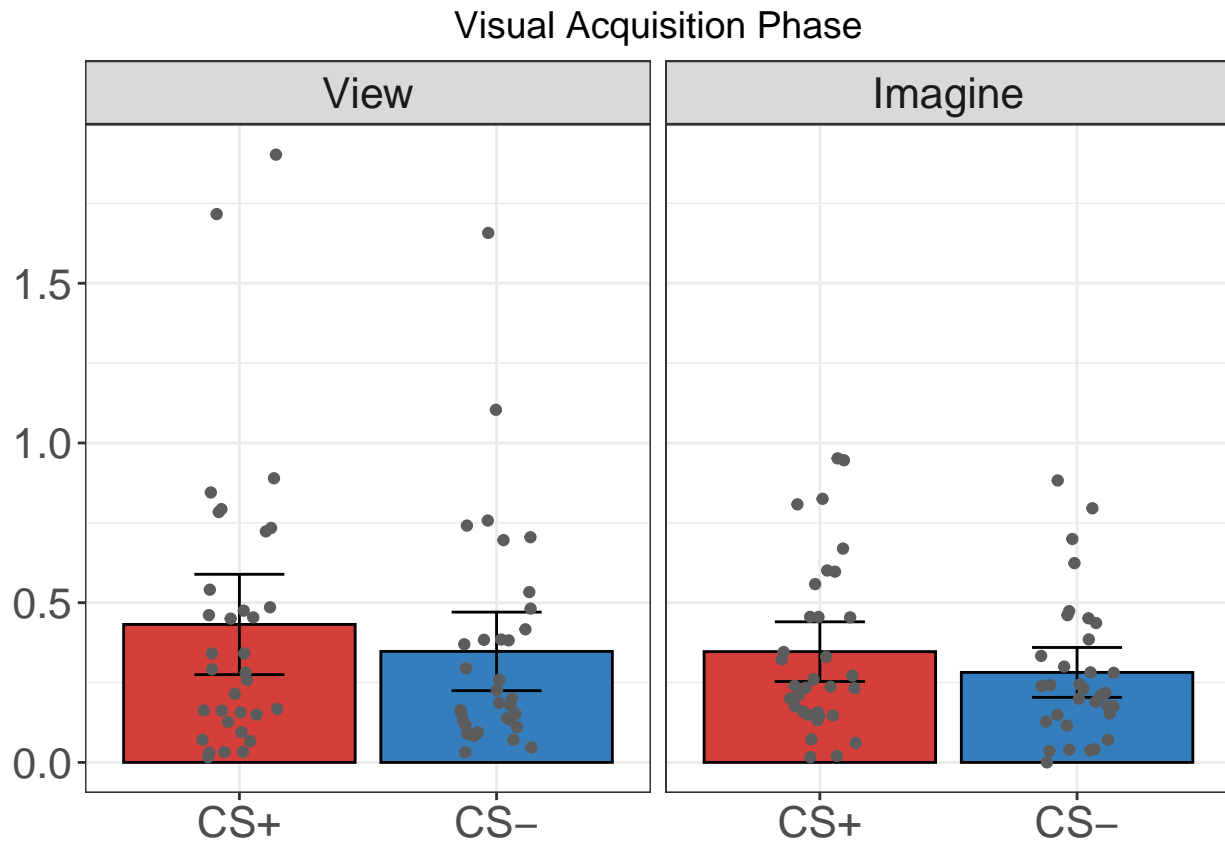
```
print(anovatbl)
```

```
## $ANOVA
##          Effect DFn DFd          SSn          SSd          F          p
## 1      (Intercept) 1 32 33.233600736 14.4247690 73.72563292 8.210715e-10
## 2              CS 1 32 0.510938935 1.7961241 9.10295984 4.972415e-03
## 3          Percept 1 32 0.021637631 1.6073971 0.43076115 5.163078e-01
## 4              Phase 1 32 0.002115153 3.1987109 0.02116005 8.852562e-01
## 5      CS:Percept 1 32 0.060303990 0.3944673 4.89198338 3.424269e-02
## 6      CS:Phase 1 32 0.011725847 0.5816633 0.64509329 4.277982e-01
## 7  Percept:Phase 1 32 0.577928269 1.7142065 10.78849311 2.478412e-03
## 8 CS:Percept:Phase 1 32 0.105074911 0.6014927 5.59008796 2.429626e-02
##    p<.05      ges
## 1      * 5.774491e-01
```

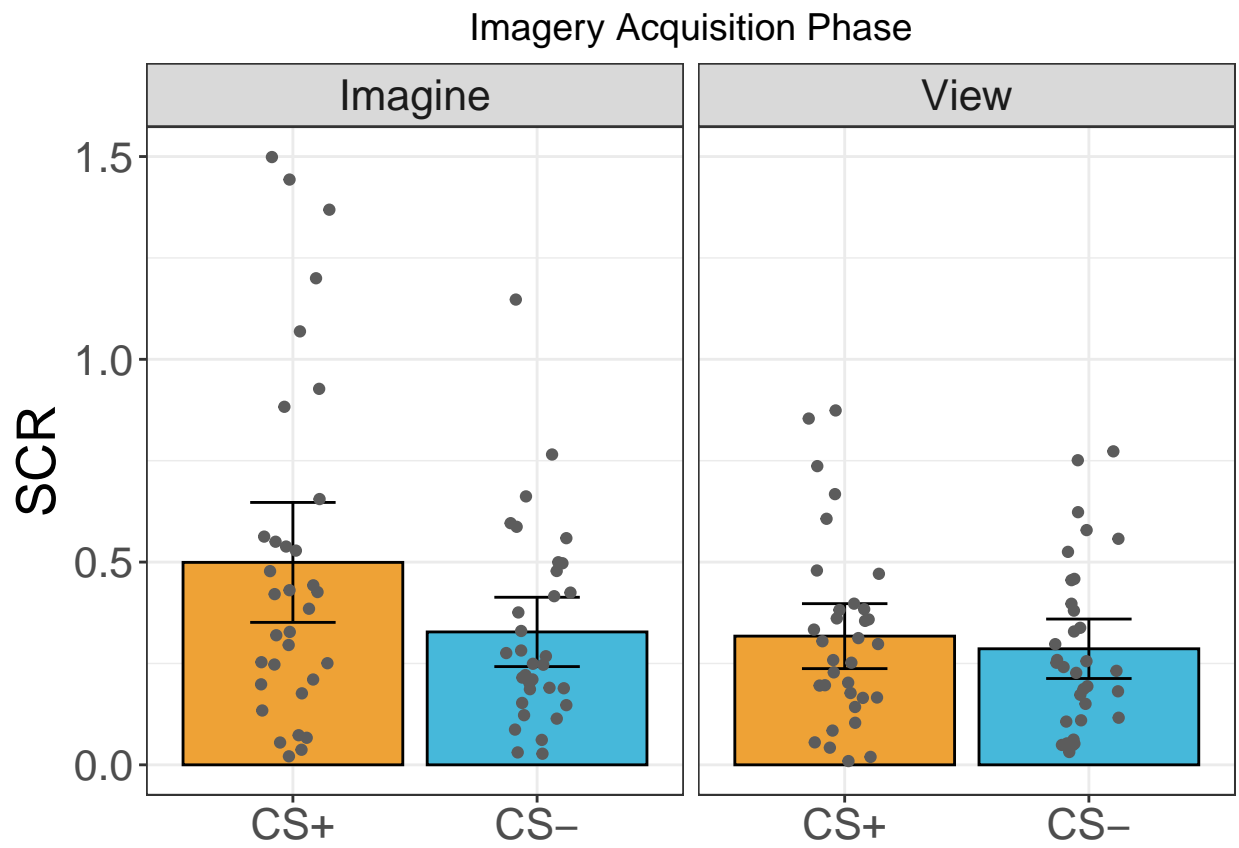
```
## 2      * 2.057768e-02
## 3      8.889571e-04
## 4      8.696837e-05
## 5      * 2.473590e-03
## 6      4.819391e-04
## 7      * 2.321299e-02
## 8      * 4.302134e-03
```

```
table2 <- apa.ezANOVA.table(anovatbl, table.number = 2, filename = "gsranova.doc")
```

Visual Acquisition (Set B)



Imagery Acquisition (Set A)



Three-way ANOVA Skin Conductance Follow-up tests

Visual Acquisition Primary Analyses (Set B)

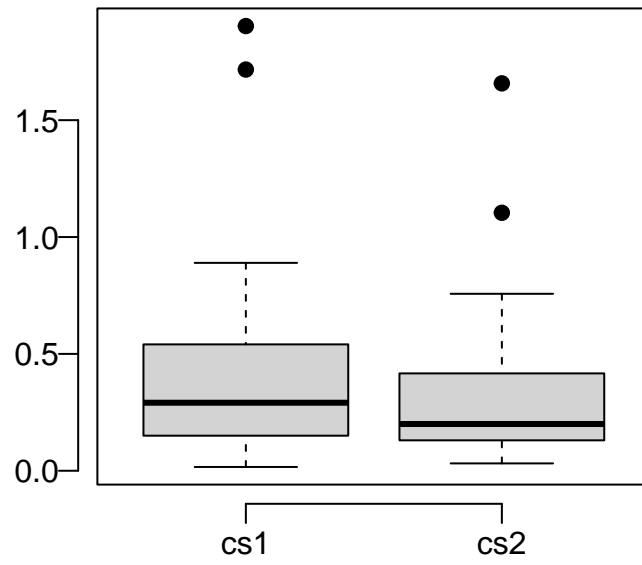
Fear View

```
t.test(data ~ groups, data = subset(longB, groups %in% c("GSR_B_cCspv", "GSR_B_cCsmv")), paired=TRUE)

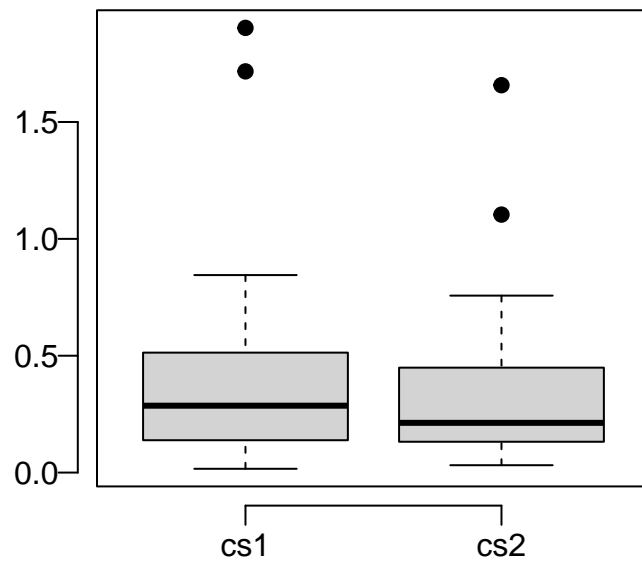
##
## Paired t-test
##
## data: data by groups
## t = 2.21, df = 32, p-value = 0.03438
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  0.006602447 0.162056991
## sample estimates:
## mean difference
##      0.08432972

cohens_d(longB$data[longB$groups == "GSR_B_cCspv"], longB$data[longB$groups == "GSR_B_cCsmv"], paired =

## Cohen's d |      95% CI
## -----
## 0.38      | [0.03, 0.74]
```

Bayesian Test



```

## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 33 0.43 0.44 0.02 1.90  1.89 0.08
## cs2     2 33 0.35 0.35 0.03 1.66  1.63 0.06
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test    two.sided 0.9019389 0.005983451  0  0      0
##      LCI      HCI t.statistic df    p.value    cohenD    cohenDM    hedgesG
## 1 0.006602447 0.162057    2.209958 32 0.03438108 0.1935087 negligible 0.1889376
##      hedgesGM
## 1 negligible
##
## $bayes.results
##      LNI HNI rscale    bf10    bf01    propError
## 1 -Inf Inf  0.707 1.55959 0.6411943 0.0001897856
##
## $res.out
## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 32 0.42 0.44 0.02 1.90  1.89 0.08
## cs2     2 32 0.36 0.35 0.03 1.66  1.63 0.06
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test    two.sided 0.9540406 0.1875274  0  0      0
##      LCI      HCI t.statistic df    p.value    cohenD    cohenDM
## 1 -0.003175502 0.1274182    1.940328 31 0.06148249 0.135814 negligible
##      hedgesG    hedgesGM
## 1 0.1325014 negligible
##
## $bayes.results
##      LNI HNI rscale    bf10    bf01    propError
## 1 -Inf Inf  0.707 0.9910754 1.009005 0.0002360104
##
## attr("class")
## [1] "csCompare"
##
## attr("class")
## [1] "csCompare"

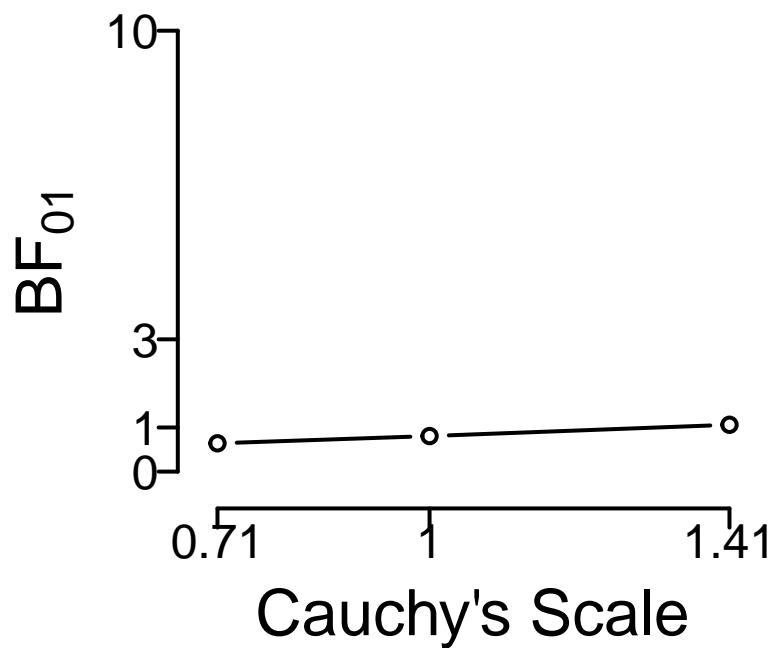
## [1] "anecdotal evidence (BF = 1.56) in favour of"
## (Rules: jeffreys1961)

Sensitivity + Robustness

## $res
##      nG1 nG2 LNI HNI rscale      bf10      bf01
## 1 33  0 -Inf Inf  0.707 1.55958965629244 0.641194301312095
## 2 33  0 -Inf Inf      1 1.24046808670035 0.806147300943475
## 3 33  0 -Inf Inf  1.41 0.943926079447277 1.05940499131622
##      propError
## 1 0.000189785556536519
## 2 0.000251130903450199
## 3 2.08641599019115e-08

```

```
##
## $res.out
##   nG1 nG2  LNI HNI rscale          bf10          bf01
## 1  32   0 -Inf Inf   0.707 0.991075449001712 1.00900491582884
## 2  32   0 -Inf Inf       1 0.775063513842733 1.2902168430585
## 3  32   0 -Inf Inf   1.41 0.583524759935591 1.713723339024
##           propError
## 1 0.000236010391309028
## 2 0.000349889983534851
## 3 0.000513727082932789
##
## attr("class")
## [1] "csSensitivity"
```



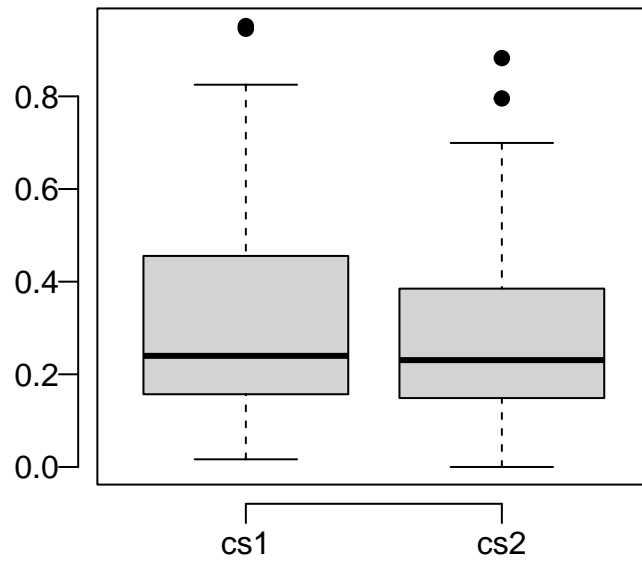
Generalized Fear to Imagine

```
t.test(data ~ groups, data = subset(longB, groups %in% c("GSR_B_cCspi", "GSR_B_cCsmi")), paired=TRUE)

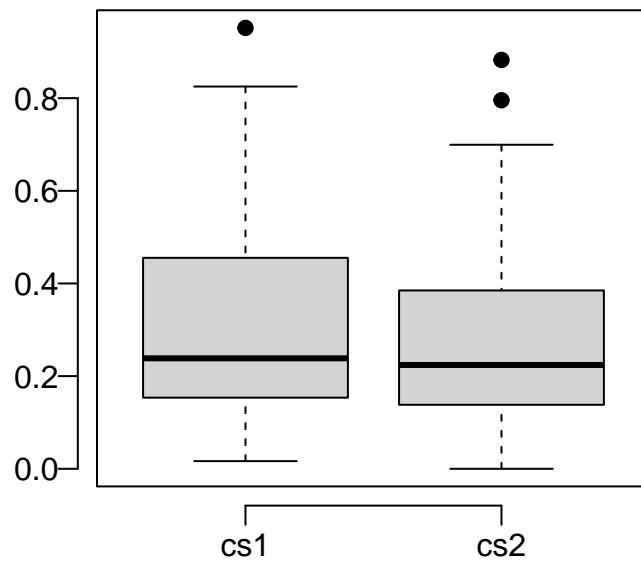
##
## Paired t-test
##
## data: data by groups
## t = 2.3282, df = 32, p-value = 0.02638
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 0.008128848 0.121838554
```

```
## sample estimates:
## mean difference
##      0.0649837
cohens_d(longB$data[longB$groups == "GSR_B_cCspi"], longB$data[longB$groups == "GSR_B_cCsmi"], paired =

## Cohen's d |          95% CI
## -----
## 0.41      | [0.05, 0.76]
```

Bayesian Test



```

## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 33 0.35 0.26 0.02 0.95  0.94 0.05
## cs2     2 33 0.28 0.22 0.00 0.88  0.88 0.04
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value      LCI
## 1 Paired t-test  two.sided 0.961706 0.2886361  0  0      0 0.008128848
##      HCI t.statistic df      p.value      cohenD cohenDM  hedgesG hedgesGM
## 1 0.1218386      2.328165 32 0.02638329 0.2598935  small 0.2537543  small
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01      propError
## 1 -Inf Inf  0.707 1.936672 0.5163498 1.430547e-08
##
## $res.out
## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 32 0.33 0.24 0.02 0.95  0.94 0.04
## cs2     2 32 0.28 0.22 0.00 0.88  0.88 0.04
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test  two.sided 0.9813377 0.8374282  0  0      0
##      LCI      HCI t.statistic df      p.value      cohenD cohenDM  hedgesG
## 1 0.0006365684 0.09833691      2.06609 31 0.0472627 0.209432  small 0.2043239
##      hedgesGM
## 1      small
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01      propError
## 1 -Inf Inf  0.707 1.220874 0.819085 0.0002152882
##
## attr("class")
## [1] "csCompare"
##
## attr("class")
## [1] "csCompare"

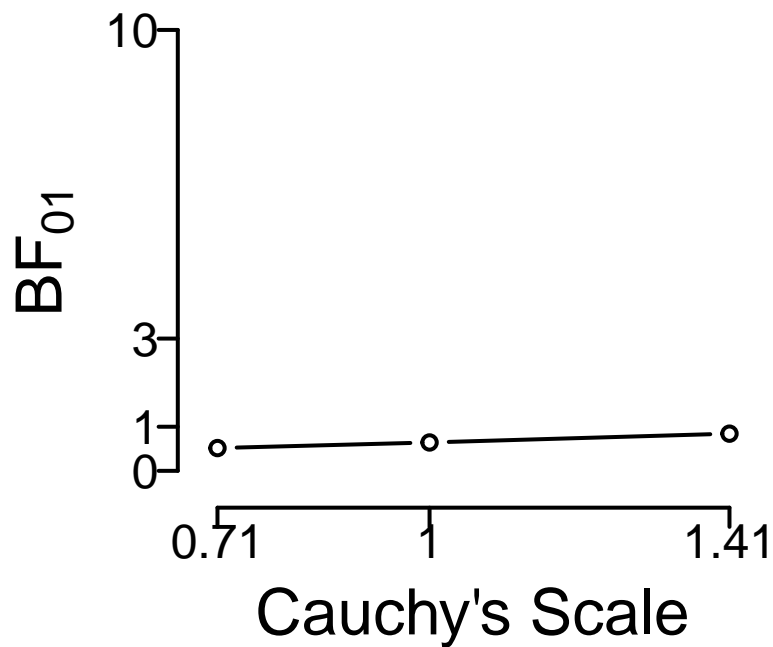
## [1] "anecdotal evidence (BF = 1.94) in favour of"
## (Rules: jeffreys1961)

Sensitivity + Robustness

## $res
##      nG1 nG2  LNI HNI rscale      bf10      bf01
## 1 33  0 -Inf Inf  0.707 1.93667160383877 0.516349802422801
## 2 33  0 -Inf Inf      1 1.55392130657715 0.643533231552581
## 3 33  0 -Inf Inf  1.41 1.18915494195746 0.840933308786412
##      propError
## 1 1.43054693172836e-08
## 2 1.35198457454844e-08
## 3 1.55690708875138e-08
##
## $res.out

```

```
##      nG1 nG2  LNI HNI rscale          bf10          bf01
## 1   32   0 -Inf Inf   0.707  1.22087449954108 0.819085008635935
## 2   32   0 -Inf Inf       1 0.963295507139244 1.03810304583456
## 3   32   0 -Inf Inf   1.41 0.729351377043975 1.37108125311691
##           propError
## 1 0.000215288196405174
## 2 0.000302149052449609
## 3 2.85035955642397e-08
##
## attr("class")
## [1] "csSensitivity"
```



Imagery Acquisition Primary Analyses (Set A)

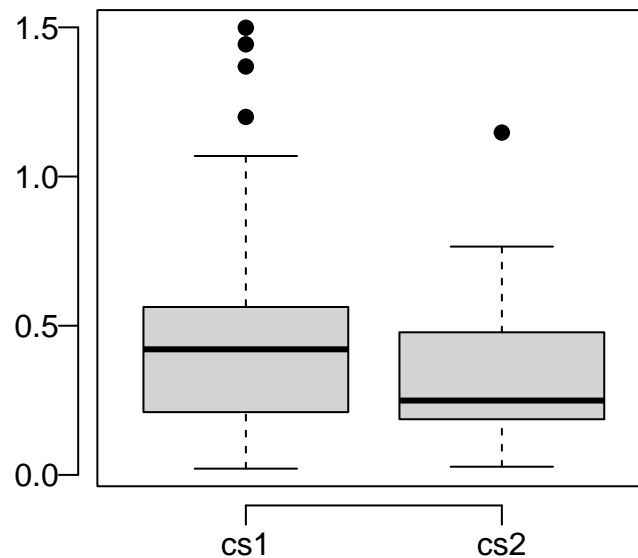
Fear Imagine

```
t.test(data ~ groups, data = subset(longA, groups %in% c("GSR_A_cCspi", "GSR_A_cCsmi")), paired=TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 3.1752, df = 32, p-value = 0.003304
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 0.06146065 0.28142478
```

```
## sample estimates:
## mean difference
##      0.1714427
cohens_d(longA$data[longA$groups == "GSR_A_cCspi"], longA$data[longA$groups == "GSR_A_cCsmi"], paired =

## Cohen's d |      95% CI
## -----
## 0.55      | [0.18, 0.92]
```



Bayesian Test

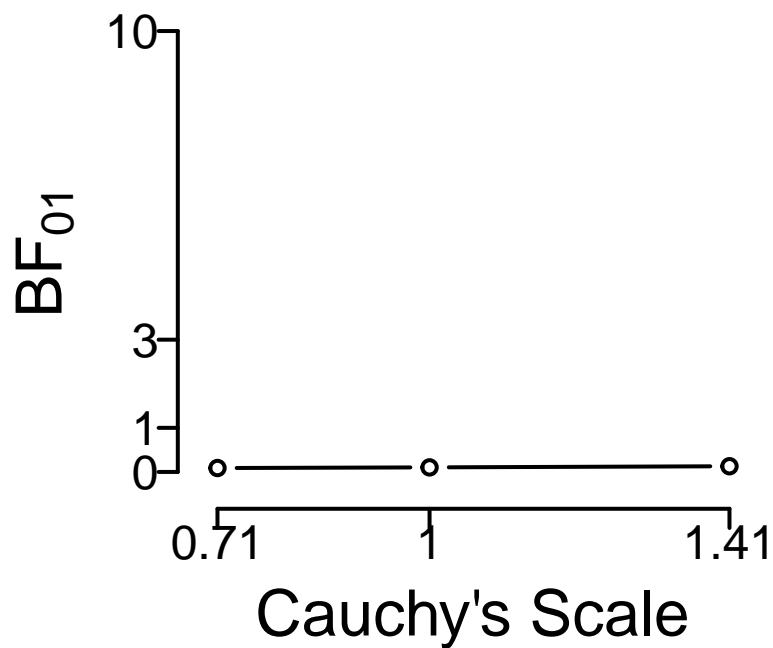
```
## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 33 0.50 0.42 0.02 1.50  1.48 0.07
## cs2     2 33 0.33 0.24 0.03 1.15  1.12 0.04
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test    two.sided 0.8667215 0.0008126084    0    0
##      LCI      HCI t.statistic df      p.value      cohenD cohenDM  hedgesG
## 1 0.06146065 0.2814248    3.175221 32 0.003303847 0.4451669    small 0.4346512
##      hedgesGM
## 1      small
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01      propError
## 1 -Inf Inf  0.707 11.30393 0.08846483 8.165251e-10
##
```

```
## attr("class")
## [1] "csCompare"

## [1] "strong evidence (BF = 11.30) in favour of"
## (Rules: jeffreys1961)

Sensitivity + Robustness

## $res
##   nG1 nG2  LNI HNI rscale          bf10          bf01
## 1  33   0 -Inf Inf  0.707  11.303927352875 0.0884648289734158
## 2  33   0 -Inf Inf      1  9.69538040967565 0.103141904468445
## 3  33   0 -Inf Inf  1.41  7.7617636439241 0.128836698188149
##           propError
## 1 8.16525148074741e-10
## 2  8.706135034776e-10
## 3 9.87672359288402e-10
##
## attr("class")
## [1] "csSensitivity"
```



Generalized Fear to View

```
t.test(data ~ groups, data = subset(longA, groups %in% c("GSR_A_cSpv", "GSR_A_cCsmv")), paired=TRUE)

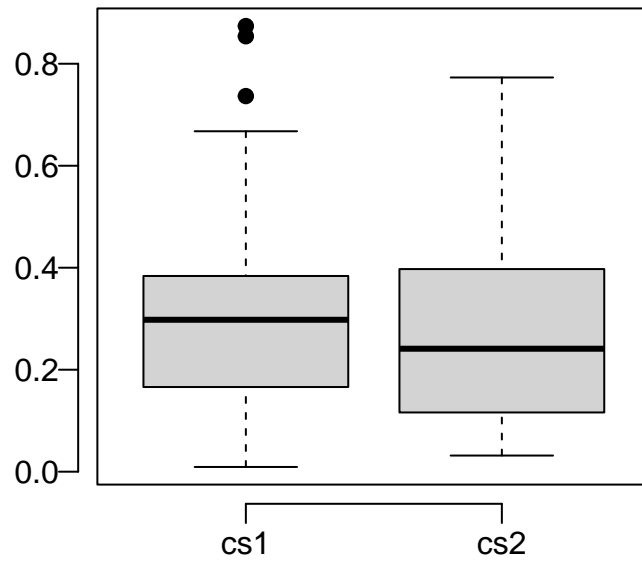
##
## Paired t-test
##
```

```

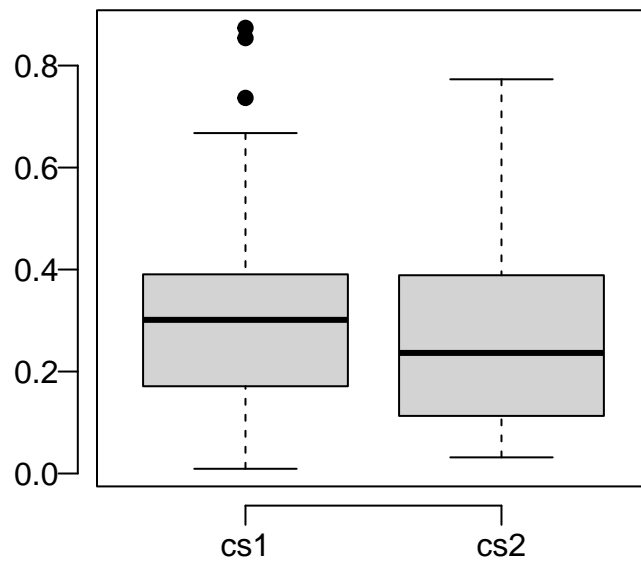
## data: data by groups
## t = 0.88596, df = 32, p-value = 0.3822
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.04051598 0.10289002
## sample estimates:
## mean difference
## 0.03118702
cohens_d(longA$data[longA$groups == "GSR_A_cCspv"], longA$data[longA$groups == "GSR_A_cCsmv"], paired =

## Cohen's d | 95% CI
## -----
## 0.15 | [-0.19, 0.50]

```

Bayesian Test




```

## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 33 0.32 0.23 0.01 0.87  0.86 0.04
## cs2     2 33 0.29 0.21 0.03 0.77  0.74 0.04
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value
## 1 Paired t-test   two.sided 0.9188117 0.01698664  0  0      0
##      LCI      HCI t.statistic df   p.value   cohenD   cohenDM   hedgesG
## 1 -0.04051598 0.10289   0.8859586 32 0.3822495 0.1436539 negligible 0.1402605
##      hedgesGM
## 1 negligible
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01      propError
## 1 -Inf Inf  0.707 0.2674517 3.738993 0.0003674443
##
## $res.out
## $descriptives
##      vars  n mean   sd  min  max range   se
## cs1     1 32 0.32 0.23 0.01 0.87  0.86 0.04
## cs2     2 32 0.27 0.19 0.03 0.77  0.74 0.03
##
## $freq.results
##      method alternative      WG1      WpG1 WG2 WpG2 null.value      LCI
## 1 Paired t-test   two.sided 0.934982 0.05400352  0  0      0 -0.01155908
##      HCI t.statistic df   p.value   cohenD cohenDM   hedgesG hedgesGM
## 1 0.1124503   1.659302 31 0.1071399 0.2358249   small 0.2300731   small
##
## $bayes.results
##      LNI HNI rscale      bf10      bf01      propError
## 1 -Inf Inf  0.707 0.6462075 1.54749 0.0002787867
##
## attr("class")
## [1] "csCompare"
##
## attr("class")
## [1] "csCompare"

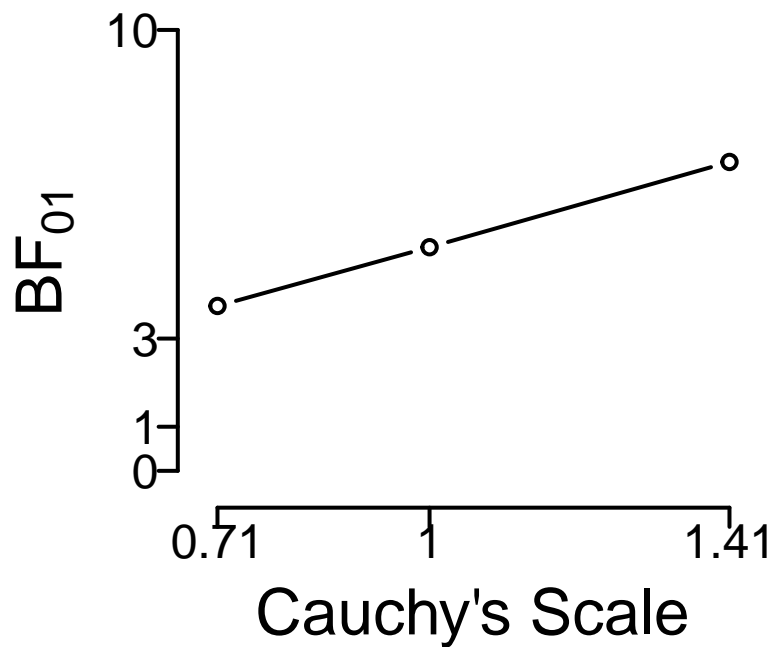
## [1] "moderate evidence (BF = 1/3.74) against"
## (Rules: jeffreys1961)

Sensitivity + Robustness

## $res
##      nG1 nG2  LNI HNI rscale      bf10      bf01
## 1 33  0 -Inf Inf  0.707 0.267451714226885 3.73899267346508
## 2 33  0 -Inf Inf      1 0.197158387516327 5.07206420481193
## 3 33  0 -Inf Inf  1.41 0.143142003393929 6.98606961122367
##      propError
## 1 0.000367444329349406
## 2 0.000788571999036854
## 3 0.00139868717034854
##
## $res.out

```

```
##      nG1 nG2  LNI HNI rscale          bf10          bf01
## 1   32   0 -Inf Inf  0.707 0.646207527185938 1.54749048553293
## 2   32   0 -Inf Inf      1 0.496045355912526 2.01594468747802
## 3   32   0 -Inf Inf  1.41 0.369127015517458 2.70909458793786
##              propError
## 1 0.00027878670696296
## 2 0.000464895500453196
## 3 0.000724008054694506
##
## attr("class")
## [1] "csSensitivity"
```



Visual Acquisition Additional follow-ups (Set B)

CS+s

```
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_B_cCspi", "GSR_B_cCspv")), pa
```

```
##
## Paired t-test
##
## data: data by groups
## t = 1.7073, df = 32, p-value = 0.09745
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.01643663 0.18672201
```

```
## sample estimates:
## mean difference
##      0.08514269

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCspi"], longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCsmv"])

## Cohen's d |          95% CI
## -----
## -0.30      | [-0.64, 0.05]
```

CS-s

```
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_B_cCsmi", "GSR_B_cCsmv")), paired = TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 1.4268, df = 32, p-value = 0.1633
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.02813562 0.15972896
## sample estimates:
## mean difference
##      0.06579667

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCsmi"], longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCsmv"])

## Cohen's d |          95% CI
## -----
## -0.25      | [-0.59, 0.10]
```

Imagery Acquisition Additional follow-ups (Set A)

CS+s

```
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCspi", "GSR_A_cCspv")), paired = TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -3.9844, df = 32, p-value = 0.0003659
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.2747565 -0.0888643
## sample estimates:
## mean difference
##      -0.1818104

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCspi"], longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCspv"])

## Cohen's d |          95% CI
## -----
## 0.69       | [0.31, 1.07]
```

CS-s

```
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCsmi", "GSR_A_cCsmv")), pa

##
## Paired t-test
##
## data: data by groups
## t = -1.0796, df = 32, p-value = 0.2884
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.1199601 0.0368507
## sample estimates:
## mean difference
## -0.0415547

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCsmi"], longfctm.complete$data[long

## Cohen's d |          95% CI
## -----
## 0.19      | [-0.16, 0.53]
```

Across Phase Analyses

CS+s

Acquiring fear to an imagined vs a viewed stimulus

```
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCspi", "GSR_B_cCspv")), pa

##
## Paired t-test
##
## data: data by groups
## t = 1.0875, df = 32, p-value = 0.2849
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.05877476 0.19342277
## sample estimates:
## mean difference
## 0.067324

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCspi"], longfctm.complete$data[long

## Cohen's d |          95% CI
## -----
## 0.19      | [-0.16, 0.53]
```

Generalized fear to an imagined vs a viewed stimulus

```
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_B_cCspi", "GSR_A_cCspv")), pa

##
## Paired t-test
##
## data: data by groups
## t = -0.91691, df = 32, p-value = 0.3661
## alternative hypothesis: true mean difference is not equal to 0
```

```

## 95 percent confidence interval:
## -0.0945316 0.0358442
## sample estimates:
## mean difference
## -0.0293437
cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCspi"], longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCspv"])

## Cohen's d |          95% CI
## -----
## 0.16      | [-0.19, 0.50]

Fear acquired to a viewed stimulus vs fear generalized to a viewed stimulus
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCspv", "GSR_B_cCspv")), paired = TRUE)

##
## Paired t-test
##
## data: data by groups
## t = -2.0301, df = 32, p-value = 0.05073
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.2293573462 0.0003845734
## sample estimates:
## mean difference
## -0.1144864
cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCspv"], longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCspi"])

## Cohen's d |          95% CI
## -----
## -0.35     | [-0.70, 0.00]

Fear acquired to an imagined stimulus vs fear generalized to an imagined stimulus
t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCspi", "GSR_B_cCspi")), paired = TRUE)

##
## Paired t-test
##
## data: data by groups
## t = 2.6505, df = 32, p-value = 0.01239
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 0.03529572 0.26963767
## sample estimates:
## mean difference
## 0.1524667
cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCspi"], longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCspi"])

## Cohen's d |          95% CI
## -----
## 0.46      | [0.10, 0.82]

```

CS-s

Acquired percept modalities (CS- imagine Set A vs CS- view Set B)

```

t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCsmi", "GSR_B_cCsmv")), pa

##
## Paired t-test
##
## data: data by groups
## t = -0.30664, df = 32, p-value = 0.7611
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.1512416 0.1116636
## sample estimates:
## mean difference
## -0.01978899

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCsmi"], longfctm.complete$data[long

## Cohen's d | 95% CI
## -----
## -0.05 | [-0.39, 0.29]

Generalized percept modalities (CS- imagine Set B vs CS- view Set A)

t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_B_cCsmi", "GSR_A_cCsmv")), pa

##
## Paired t-test
##
## data: data by groups
## t = 0.10136, df = 32, p-value = 0.9199
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.08503157 0.09393754
## sample estimates:
## mean difference
## 0.004452982

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCsmi"], longfctm.complete$data[long

## Cohen's d | 95% CI
## -----
## -0.02 | [-0.36, 0.32]

Viewed CS-s

t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCsmv", "GSR_B_cCsmv")), pa

##
## Paired t-test
##
## data: data by groups
## t = -1.0482, df = 32, p-value = 0.3024
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.18054987 0.05786249
## sample estimates:
## mean difference
## -0.06134369

```

```

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCsmv"], longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCsmv"])

## Cohen's d |          95% CI
## -----
## -0.18      | [-0.53, 0.16]

Imagined CS-s

t.test(data ~ groups, data = subset(longfctm.complete, groups %in% c("GSR_A_cCsmi", "GSR_B_cCsmi")), paired = FALSE)

##
## Paired t-test
##
## data: data by groups
## t = 1.139, df = 32, p-value = 0.2631
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -0.0362681  0.1282835
## sample estimates:
## mean difference
## 0.04600768

cohens_d(longfctm.complete$data[longfctm.complete$groups == "GSR_A_cCsmi"], longfctm.complete$data[longfctm.complete$groups == "GSR_B_cCsmi"])

## Cohen's d |          95% CI
## -----
## 0.20       | [-0.15, 0.54]

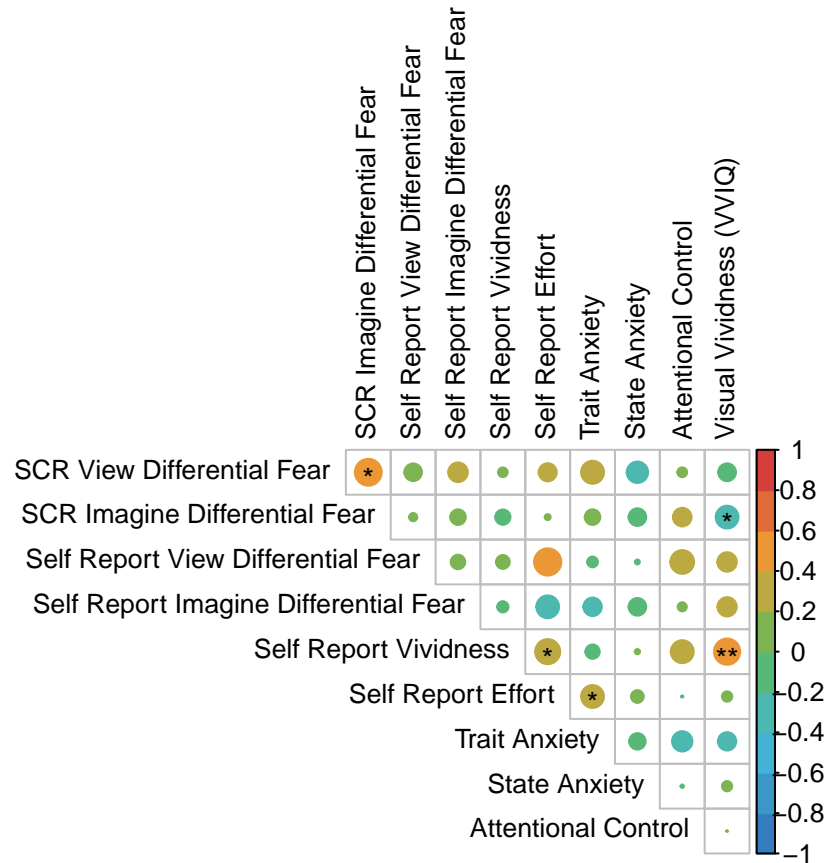
```

Pretty Correlation Graphs for Funsies

Visual Acquisition

```
col1 <- colorRampPalette(c("#357EBDFF", "#46B8DAFF", "#5CB85CFF", "#EEA236FF", "#D43F3AFF"))

corrplot(corrs, cl.ratio = .19, type = "upper", tl.cex = .8, tl.col = "black", diag = FALSE, number.cex = .8)
```



Imagery Acquisition

```
col1 <- colorRampPalette(c("#357EBDFF", "#46B8DAFF", "#5CB85CFF", "#EEA236FF", "#D43F3AFF"))

corrplot(corrdiff, cl.ratio = .19, type = "upper", tl.cex = .8, tl.col = "black", diag = FALSE, number.cex = .8)
```