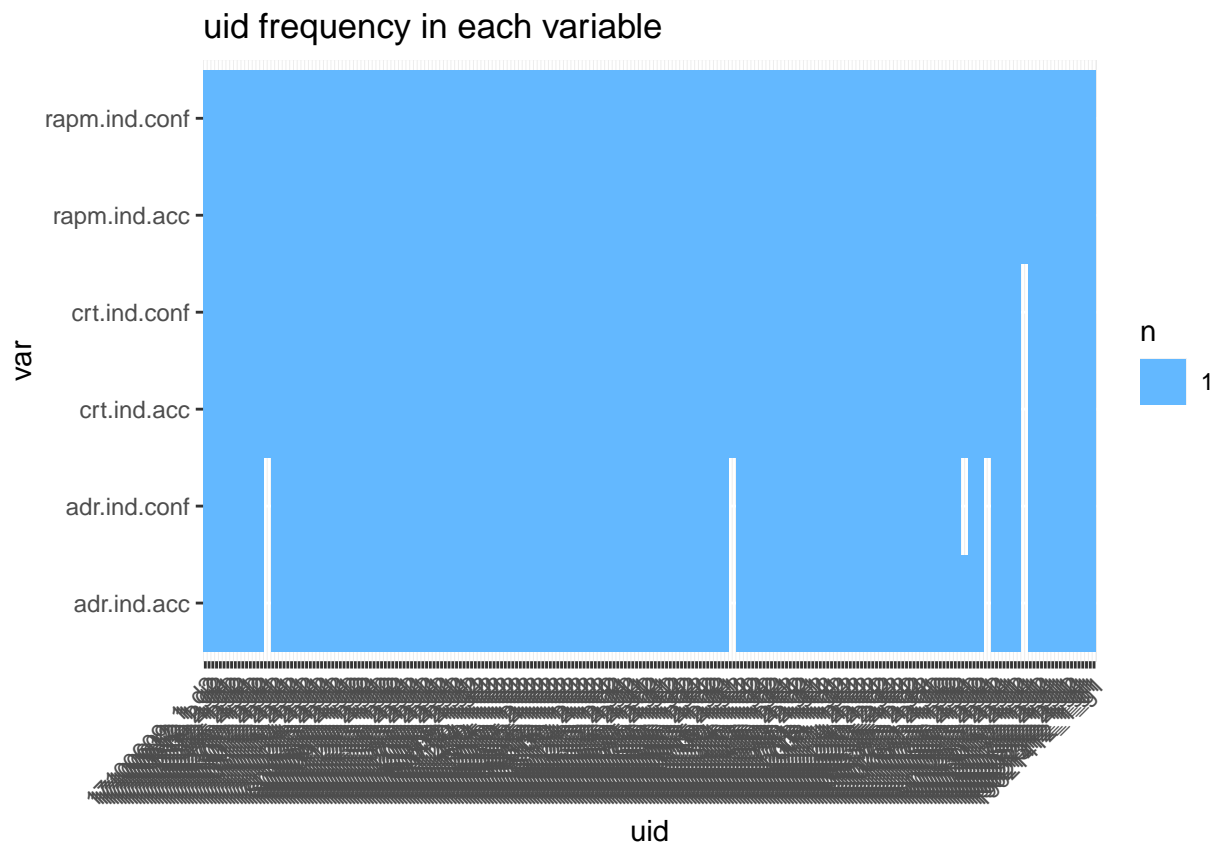


CFA

Matthew Blanchard

Missing value analysis



Data are missing for 5 groups. I will impute missing values for now.

```
## `summarise()` regrouping output by 'group' (override with `.groups` argument)
## `summarise()` regrouping output by 'group' (override with `.groups` argument)
```

Table 1
Number of missing values for each group

group	member_1	member_2
19013010_1	4	4
17102710_2	2	2
18080915_1	2	2
18110810_2	2	2
18110713_2	1	1

Confirmatory Factor Analysis for

Fit one factor model

```
cfa_one <- paste0('
  ci =~ adr.ind.acc + crt.ind.acc + rapm.ind.acc +
  adr.ind.conf + crt.ind.conf + rapm.ind.conf')
```

Table 2
Goodness of fit indices

index	value
chisq	138.256
df	9.000
pvalue	0.000
gfi	0.987
tli	0.602
cfi	0.761
rmsea	0.246
rmsea.ci.lower	0.210
rmsea.ci.upper	0.283

Model fit is poor: CFI and TLI are low and RMSEA is too high. Let's try a two-factor model with accuracy and confidence.

Fit two factor model (Accuracy + Confidence)

```
cfa_two <- paste0('
  accuracy =~ adr.ind.acc + crt.ind.acc + rapm.ind.acc
  confidence =~ adr.ind.conf + crt.ind.conf + rapm.ind.conf
')
```

Table 3
Goodness of fit indices

index	value
chisq	138.256
df	9.000
pvalue	0.000
gfi	0.987
tli	0.602
cfi	0.761
rmsea	0.246
rmsea.ci.lower	0.210
rmsea.ci.upper	0.283

Table 4
Test model difference

	Df	AIC	BIC	Chisq	Chisq diff	Df diff	Pr(>Chisq)
fit_two	8	12098.99	12164.97	114.5160	NA	NA	NA
fit_one	9	12120.73	12183.23	138.2558	23.73981	1	1.1e-06

The two-factor model is an improvement on the one-factor model. Although, the model fit is still poor so we may be able to do better by correlating accuracy and confidence within the same test.

Correlate accuracy and confidence within each test

Fit one factor model (correlated)

```
cfa_one_corr <- paste0('
  ci =~ adr.ind.acc + crt.ind.acc + rapm.ind.acc +
        adr.ind.conf + crt.ind.conf + rapm.ind.conf

  adr.ind.acc ~~ adr.ind.conf
  crt.ind.acc ~~ crt.ind.conf
  rapm.ind.acc ~~ rapm.ind.conf
')
```

Table 5
Goodness of fit indices

index	value
chisq	138.256
df	9.000
pvalue	0.000
gfi	0.987
tli	0.602
cfi	0.761
rmsea	0.246
rmsea.ci.lower	0.210
rmsea.ci.upper	0.283

Again, model fit is poor: CFI and TLI are low and RMSEA is too high. Let's try the two-factor model.

Fit two factor model (correlated)

```
cfa_two_corr <- paste0('
  accuracy =~ adr.ind.acc + crt.ind.acc + rapm.ind.acc
  confidence =~ adr.ind.conf + crt.ind.conf + rapm.ind.conf

  adr.ind.acc ~~ adr.ind.conf
  crt.ind.acc ~~ crt.ind.conf
  rapm.ind.acc ~~ rapm.ind.conf
')
```

Table 6
Goodness of fit indices

index	value
chisq	138.256
df	9.000
pvalue	0.000
gfi	0.987
tli	0.602
cfi	0.761
rmsea	0.246
rmsea.ci.lower	0.210
rmsea.ci.upper	0.283

Table 7
Test model difference

	Df	AIC	BIC	Chisq	Chisq diff	Df diff	Pr(>Chisq)
fit_two_corr	5	12002.46	12078.85	11.97908	NA	NA	NA
fit_one_corr	6	12087.61	12160.53	99.13595	87.15687	1	0

The two-factor model appears to be a good fit for the data and it is significantly better than the one-factor model. Yay!