recovery.R

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### Check simulated dataset to see if the appropriate item parameters  
### Can be recovered.  
# Load Dependencies  
library(mirt)

## Loading required package: stats4

## Loading required package: lattice

library(plyr)  
  
# Set Working Directory  
setwd("e:/dropbox/dissertation/03 - code")  
  
# Load utilities  
source("utils.R")  
  
d <- read.table("cyw/simd1.dat", header=T)  
  
# Select out constructs to be included and create a vector of keys for   
# reverse coded items  
sincerity <- d[,1:10]  
fairness <- d[,11:20]  
anxiety <- d[,21:30]  
dependence <- d[,31:40]  
liveliness <- d[,41:50]  
forgiveness <- d[,51:60]  
patience <- d[,61:70]  
perfectionism <- d[,71:80]  
inquisitiveness <- d[,81:90]  
unconventionality <- d[,91:100]  
  
# Create a vector of names  
n <- c("sincerity", "fairness", "anxiety", "dependence", "liveliness",  
 "forgiveness", "patience", "perfectionism", "inquisitiveness",   
 "unconventionality")  
  
# Define keys for negatively coded variables  
# Note: Negative is defined in reference to the construct name,  
# Not it's social desirability. dependence is absent because it  
# consists of only positive items.  
key <- list()  
key[["sinc"]] <- c(2:10)  
key[["fair"]] <- c(6:10)  
key[["anxi"]] <- c(6:10)  
key[["live"]] <- c(9,10)  
key[["forg"]] <- c(5:10)  
key[["pati"]] <- c(6:10)  
key[["perf"]] <- c(9,10)  
key[["inqu"]] <- c(7:10)  
key[["unco"]] <- c(6:10)  
  
# Reverse code and compute factor scores for each facet.  
for (i in 1:length(n)){  
 name <- substr(n[i],1,4)  
 if(!is.null(key[[name]])) {   
 tmp <- revcode(eval(as.name(n[i])),key[[name]],7)  
 } else tmp <- eval(as.name(n[i]))  
 tmp <- rowMeans(tmp)  
 assign(name, tmp)   
}  
  
# Combine factor scores into a matrix  
factors <- cbind(sinc,fair,anxi,depe,live,forg,pati,perf,inqu,unco)  
  
# Correlations  
fcorr <- cor(factors)  
  
# Load correlation matrix used to simulate facet-level data  
ocorr <- as.matrix(read.table("resources/fcorr.dat", header=T, row.names=1))  
  
# Find the difference between recovered facet scores and those originally  
# specified  
ftest <- abs(fcorr) - abs(ocorr)  
  
# Check max difference  
max(ftest)

## [1] 0.08668643

# Print to console  
ftest

## sinc fair anxi depe live  
## sinc 0.000000000 -0.10735296 -0.10954003 -0.083407680 -0.0686424819  
## fair -0.107352958 0.00000000 0.04340483 -0.057573137 -0.0175071149  
## anxi -0.109540032 0.04340483 0.00000000 -0.088818488 -0.0385260530  
## depe -0.083407680 -0.05757314 -0.08881849 0.000000000 -0.0062440443  
## live -0.068642482 -0.01750711 -0.03852605 -0.006244044 0.0000000000  
## forg -0.067575536 -0.06274615 -0.03526806 0.019824016 -0.0750966073  
## pati -0.105676292 -0.07889364 -0.02302022 -0.041054248 -0.0327228812  
## perf -0.021198905 0.01806893 -0.06524298 0.029615242 0.0009890409  
## inqu -0.009298605 0.01763032 0.02532277 -0.025865196 -0.0219093543  
## unco -0.016163458 -0.03927009 0.01578745 -0.071473499 -0.0584060990  
## forg pati perf inqu unco  
## sinc -0.06757554 -0.10567629 -0.0211989051 -0.009298605 -0.01616346  
## fair -0.06274615 -0.07889364 0.0180689260 0.017630322 -0.03927009  
## anxi -0.03526806 -0.02302022 -0.0652429757 0.025322766 0.01578745  
## depe 0.01982402 -0.04105425 0.0296152422 -0.025865196 -0.07147350  
## live -0.07509661 -0.03272288 0.0009890409 -0.021909354 -0.05840610  
## forg 0.00000000 -0.04194701 -0.0374744236 -0.039993489 -0.00492864  
## pati -0.04194701 0.00000000 -0.0105558680 -0.093002409 0.03368704  
## perf -0.03747442 -0.01055587 0.0000000000 0.018039208 0.08668643  
## inqu -0.03999349 -0.09300241 0.0180392077 0.000000000 -0.14967054  
## unco -0.00492864 0.03368704 0.0866864275 -0.149670540 0.00000000

# Write to file  
write.table(ftest, "cyw/ftest.dat")  
  
## Check item parameters  
# Instantiate Looping Variables  
ipar <- NULL  
rows <- NULL  
  
# Estimate item parameters by construct using the grm. eval(as.name()) replaces   
# itself with the "name" for the current value of x. Then extract the item  
# parameters from the model object as a dataframe   
for(c in 1:length(n)) {  
 y <- mirt(eval(as.name(n[c])), 1)  
 p <- as.data.frame(coef(y, simplify=T)$items)   
 ipar <- rbind.fill(ipar,p)  
 rows <- c(rows, rownames(p))  
}

##   
Iteration: 1, Log-Lik: -8928.016, Max-Change: 1.38346  
Iteration: 2, Log-Lik: -8650.739, Max-Change: 0.66542  
Iteration: 3, Log-Lik: -8615.190, Max-Change: 0.23344  
Iteration: 4, Log-Lik: -8609.462, Max-Change: 0.08167  
Iteration: 5, Log-Lik: -8608.728, Max-Change: 0.04221  
Iteration: 6, Log-Lik: -8608.359, Max-Change: 0.03137  
Iteration: 7, Log-Lik: -8608.128, Max-Change: 0.01583  
Iteration: 8, Log-Lik: -8608.070, Max-Change: 0.01033  
Iteration: 9, Log-Lik: -8608.040, Max-Change: 0.00784  
Iteration: 10, Log-Lik: -8608.015, Max-Change: 0.00514  
Iteration: 11, Log-Lik: -8608.011, Max-Change: 0.00184  
Iteration: 12, Log-Lik: -8608.010, Max-Change: 0.00103  
Iteration: 13, Log-Lik: -8608.010, Max-Change: 0.00074  
Iteration: 14, Log-Lik: -8608.009, Max-Change: 0.00026  
Iteration: 15, Log-Lik: -8608.009, Max-Change: 0.00046  
Iteration: 16, Log-Lik: -8608.009, Max-Change: 0.00016  
Iteration: 17, Log-Lik: -8608.009, Max-Change: 0.00033  
Iteration: 18, Log-Lik: -8608.009, Max-Change: 0.00010  
Iteration: 1, Log-Lik: -8863.644, Max-Change: 0.64163  
Iteration: 2, Log-Lik: -8675.217, Max-Change: 0.71190  
Iteration: 3, Log-Lik: -8564.018, Max-Change: 0.82709  
Iteration: 4, Log-Lik: -8092.599, Max-Change: 1.10687  
Iteration: 5, Log-Lik: -7913.836, Max-Change: 0.68531  
Iteration: 6, Log-Lik: -7863.152, Max-Change: 0.43262  
Iteration: 7, Log-Lik: -7834.036, Max-Change: 0.17141  
Iteration: 8, Log-Lik: -7825.195, Max-Change: 0.14645  
Iteration: 9, Log-Lik: -7819.526, Max-Change: 0.09748  
Iteration: 10, Log-Lik: -7816.808, Max-Change: 0.06311  
Iteration: 11, Log-Lik: -7815.334, Max-Change: 0.04181  
Iteration: 12, Log-Lik: -7814.469, Max-Change: 0.03453  
Iteration: 13, Log-Lik: -7813.809, Max-Change: 0.02348  
Iteration: 14, Log-Lik: -7813.528, Max-Change: 0.01650  
Iteration: 15, Log-Lik: -7813.344, Max-Change: 0.01311  
Iteration: 16, Log-Lik: -7812.891, Max-Change: 0.00640  
Iteration: 17, Log-Lik: -7812.872, Max-Change: 0.00588  
Iteration: 18, Log-Lik: -7812.861, Max-Change: 0.00441  
Iteration: 19, Log-Lik: -7812.835, Max-Change: 0.00317  
Iteration: 20, Log-Lik: -7812.831, Max-Change: 0.00301  
Iteration: 21, Log-Lik: -7812.828, Max-Change: 0.00158  
Iteration: 22, Log-Lik: -7812.826, Max-Change: 0.00185  
Iteration: 23, Log-Lik: -7812.824, Max-Change: 0.00130  
Iteration: 24, Log-Lik: -7812.823, Max-Change: 0.00141  
Iteration: 25, Log-Lik: -7812.821, Max-Change: 0.00141  
Iteration: 26, Log-Lik: -7812.820, Max-Change: 0.00061  
Iteration: 27, Log-Lik: -7812.820, Max-Change: 0.00014  
Iteration: 28, Log-Lik: -7812.820, Max-Change: 0.00013  
Iteration: 29, Log-Lik: -7812.820, Max-Change: 0.00041  
Iteration: 30, Log-Lik: -7812.820, Max-Change: 0.00047  
Iteration: 31, Log-Lik: -7812.820, Max-Change: 0.00020  
Iteration: 32, Log-Lik: -7812.820, Max-Change: 0.00037  
Iteration: 33, Log-Lik: -7812.820, Max-Change: 0.00015  
Iteration: 34, Log-Lik: -7812.820, Max-Change: 0.00063  
Iteration: 35, Log-Lik: -7812.820, Max-Change: 0.00030  
Iteration: 36, Log-Lik: -7812.819, Max-Change: 0.00052  
Iteration: 37, Log-Lik: -7812.819, Max-Change: 0.00103  
Iteration: 38, Log-Lik: -7812.819, Max-Change: 0.00010  
Iteration: 39, Log-Lik: -7812.819, Max-Change: 0.00081  
Iteration: 40, Log-Lik: -7812.819, Max-Change: 0.00029  
Iteration: 41, Log-Lik: -7812.819, Max-Change: 0.00050  
Iteration: 42, Log-Lik: -7812.819, Max-Change: 0.00022  
Iteration: 43, Log-Lik: -7812.819, Max-Change: 0.00018  
Iteration: 44, Log-Lik: -7812.819, Max-Change: 0.00031  
Iteration: 45, Log-Lik: -7812.819, Max-Change: 0.00014  
Iteration: 46, Log-Lik: -7812.819, Max-Change: 0.00012  
Iteration: 47, Log-Lik: -7812.819, Max-Change: 0.00022  
Iteration: 48, Log-Lik: -7812.819, Max-Change: 0.00044  
Iteration: 49, Log-Lik: -7812.819, Max-Change: 0.00019  
Iteration: 50, Log-Lik: -7812.818, Max-Change: 0.00033  
Iteration: 51, Log-Lik: -7812.818, Max-Change: 0.00014  
Iteration: 52, Log-Lik: -7812.818, Max-Change: 0.00011  
Iteration: 53, Log-Lik: -7812.818, Max-Change: 0.00021  
Iteration: 54, Log-Lik: -7812.818, Max-Change: 0.00009  
Iteration: 1, Log-Lik: -9066.362, Max-Change: 0.99947  
Iteration: 2, Log-Lik: -8739.820, Max-Change: 1.70639  
Iteration: 3, Log-Lik: -8087.051, Max-Change: 1.14736  
Iteration: 4, Log-Lik: -7947.364, Max-Change: 1.20866  
Iteration: 5, Log-Lik: -7922.505, Max-Change: 0.28605  
Iteration: 6, Log-Lik: -7916.059, Max-Change: 0.17728  
Iteration: 7, Log-Lik: -7910.861, Max-Change: 0.11017  
Iteration: 8, Log-Lik: -7908.124, Max-Change: 0.08750  
Iteration: 9, Log-Lik: -7906.616, Max-Change: 0.05593  
Iteration: 10, Log-Lik: -7906.059, Max-Change: 0.03785  
Iteration: 11, Log-Lik: -7905.475, Max-Change: 0.03108  
Iteration: 12, Log-Lik: -7905.098, Max-Change: 0.02593  
Iteration: 13, Log-Lik: -7904.430, Max-Change: 0.00612  
Iteration: 14, Log-Lik: -7904.412, Max-Change: 0.00427  
Iteration: 15, Log-Lik: -7904.400, Max-Change: 0.00374  
Iteration: 16, Log-Lik: -7904.373, Max-Change: 0.00226  
Iteration: 17, Log-Lik: -7904.369, Max-Change: 0.00139  
Iteration: 18, Log-Lik: -7904.368, Max-Change: 0.00093  
Iteration: 19, Log-Lik: -7904.367, Max-Change: 0.00085  
Iteration: 20, Log-Lik: -7904.366, Max-Change: 0.00087  
Iteration: 21, Log-Lik: -7904.365, Max-Change: 0.00076  
Iteration: 22, Log-Lik: -7904.365, Max-Change: 0.00027  
Iteration: 23, Log-Lik: -7904.365, Max-Change: 0.00091  
Iteration: 24, Log-Lik: -7904.364, Max-Change: 0.00115  
Iteration: 25, Log-Lik: -7904.364, Max-Change: 0.00169  
Iteration: 26, Log-Lik: -7904.363, Max-Change: 0.00014  
Iteration: 27, Log-Lik: -7904.363, Max-Change: 0.00023  
Iteration: 28, Log-Lik: -7904.362, Max-Change: 0.00018  
Iteration: 29, Log-Lik: -7904.362, Max-Change: 0.00033  
Iteration: 30, Log-Lik: -7904.362, Max-Change: 0.00012  
Iteration: 31, Log-Lik: -7904.362, Max-Change: 0.00010  
Iteration: 32, Log-Lik: -7904.362, Max-Change: 0.00021  
Iteration: 33, Log-Lik: -7904.362, Max-Change: 0.00009  
Iteration: 1, Log-Lik: -8532.740, Max-Change: 1.21498  
Iteration: 2, Log-Lik: -8442.914, Max-Change: 0.46523  
Iteration: 3, Log-Lik: -8433.103, Max-Change: 0.30374  
Iteration: 4, Log-Lik: -8428.108, Max-Change: 0.28123  
Iteration: 5, Log-Lik: -8425.813, Max-Change: 0.12946  
Iteration: 6, Log-Lik: -8425.163, Max-Change: 0.03062  
Iteration: 7, Log-Lik: -8424.960, Max-Change: 0.02570  
Iteration: 8, Log-Lik: -8424.596, Max-Change: 0.01920  
Iteration: 9, Log-Lik: -8424.414, Max-Change: 0.01333  
Iteration: 10, Log-Lik: -8424.262, Max-Change: 0.00581  
Iteration: 11, Log-Lik: -8424.241, Max-Change: 0.00420  
Iteration: 12, Log-Lik: -8424.230, Max-Change: 0.00366  
Iteration: 13, Log-Lik: -8424.217, Max-Change: 0.00098  
Iteration: 14, Log-Lik: -8424.216, Max-Change: 0.00052  
Iteration: 15, Log-Lik: -8424.215, Max-Change: 0.00025  
Iteration: 16, Log-Lik: -8424.215, Max-Change: 0.00020  
Iteration: 17, Log-Lik: -8424.215, Max-Change: 0.00028  
Iteration: 18, Log-Lik: -8424.215, Max-Change: 0.00031  
Iteration: 19, Log-Lik: -8424.215, Max-Change: 0.00029  
Iteration: 20, Log-Lik: -8424.215, Max-Change: 0.00011  
Iteration: 21, Log-Lik: -8424.215, Max-Change: 0.00021  
Iteration: 22, Log-Lik: -8424.215, Max-Change: 0.00008  
Iteration: 1, Log-Lik: -9017.757, Max-Change: 1.41449  
Iteration: 2, Log-Lik: -8480.900, Max-Change: 1.35214  
Iteration: 3, Log-Lik: -8385.722, Max-Change: 0.53287  
Iteration: 4, Log-Lik: -8371.848, Max-Change: 0.27522  
Iteration: 5, Log-Lik: -8368.175, Max-Change: 0.16032  
Iteration: 6, Log-Lik: -8366.516, Max-Change: 0.12742  
Iteration: 7, Log-Lik: -8365.107, Max-Change: 0.06074  
Iteration: 8, Log-Lik: -8364.700, Max-Change: 0.02333  
Iteration: 9, Log-Lik: -8364.577, Max-Change: 0.01896  
Iteration: 10, Log-Lik: -8364.484, Max-Change: 0.01101  
Iteration: 11, Log-Lik: -8364.451, Max-Change: 0.00892  
Iteration: 12, Log-Lik: -8364.428, Max-Change: 0.00832  
Iteration: 13, Log-Lik: -8364.394, Max-Change: 0.00835  
Iteration: 14, Log-Lik: -8364.390, Max-Change: 0.00059  
Iteration: 15, Log-Lik: -8364.390, Max-Change: 0.00021  
Iteration: 16, Log-Lik: -8364.390, Max-Change: 0.00018  
Iteration: 17, Log-Lik: -8364.390, Max-Change: 0.00037  
Iteration: 18, Log-Lik: -8364.389, Max-Change: 0.00016  
Iteration: 19, Log-Lik: -8364.389, Max-Change: 0.00066  
Iteration: 20, Log-Lik: -8364.389, Max-Change: 0.00025  
Iteration: 21, Log-Lik: -8364.389, Max-Change: 0.00046  
Iteration: 22, Log-Lik: -8364.389, Max-Change: 0.00308  
Iteration: 23, Log-Lik: -8364.389, Max-Change: 0.00013  
Iteration: 24, Log-Lik: -8364.389, Max-Change: 0.00030  
Iteration: 25, Log-Lik: -8364.389, Max-Change: 0.00020  
Iteration: 26, Log-Lik: -8364.389, Max-Change: 0.00009

## Warning: Log-likelihood was decreasing near the ML solution. EM method may  
## be unstable

##   
Iteration: 1, Log-Lik: -9418.766, Max-Change: 1.31229  
Iteration: 2, Log-Lik: -8849.177, Max-Change: 1.49952  
Iteration: 3, Log-Lik: -8458.929, Max-Change: 0.90876  
Iteration: 4, Log-Lik: -8422.680, Max-Change: 0.30040  
Iteration: 5, Log-Lik: -8415.089, Max-Change: 0.16202  
Iteration: 6, Log-Lik: -8412.481, Max-Change: 0.09316  
Iteration: 7, Log-Lik: -8411.244, Max-Change: 0.05468  
Iteration: 8, Log-Lik: -8410.577, Max-Change: 0.03649  
Iteration: 9, Log-Lik: -8410.206, Max-Change: 0.03184  
Iteration: 10, Log-Lik: -8409.681, Max-Change: 0.01140  
Iteration: 11, Log-Lik: -8409.642, Max-Change: 0.00820  
Iteration: 12, Log-Lik: -8409.617, Max-Change: 0.00761  
Iteration: 13, Log-Lik: -8409.584, Max-Change: 0.00366  
Iteration: 14, Log-Lik: -8409.578, Max-Change: 0.00304  
Iteration: 15, Log-Lik: -8409.574, Max-Change: 0.00296  
Iteration: 16, Log-Lik: -8409.570, Max-Change: 0.00058  
Iteration: 17, Log-Lik: -8409.569, Max-Change: 0.00074  
Iteration: 18, Log-Lik: -8409.569, Max-Change: 0.00070  
Iteration: 19, Log-Lik: -8409.569, Max-Change: 0.00058  
Iteration: 20, Log-Lik: -8409.569, Max-Change: 0.00032  
Iteration: 21, Log-Lik: -8409.569, Max-Change: 0.00048  
Iteration: 22, Log-Lik: -8409.569, Max-Change: 0.00175  
Iteration: 23, Log-Lik: -8409.568, Max-Change: 0.00008

## Warning: Log-likelihood was decreasing near the ML solution. EM method may  
## be unstable

##   
Iteration: 1, Log-Lik: -9569.236, Max-Change: 0.82591  
Iteration: 2, Log-Lik: -9230.264, Max-Change: 1.12187  
Iteration: 3, Log-Lik: -8105.994, Max-Change: 1.87325  
Iteration: 4, Log-Lik: -7839.561, Max-Change: 1.18812  
Iteration: 5, Log-Lik: -7745.627, Max-Change: 0.16313  
Iteration: 6, Log-Lik: -7726.246, Max-Change: 0.20271  
Iteration: 7, Log-Lik: -7717.530, Max-Change: 0.12252  
Iteration: 8, Log-Lik: -7708.082, Max-Change: 0.08210  
Iteration: 9, Log-Lik: -7702.899, Max-Change: 0.08952  
Iteration: 10, Log-Lik: -7699.264, Max-Change: 0.08507  
Iteration: 11, Log-Lik: -7696.705, Max-Change: 0.05812  
Iteration: 12, Log-Lik: -7694.973, Max-Change: 0.06125  
Iteration: 13, Log-Lik: -7693.018, Max-Change: 0.03676  
Iteration: 14, Log-Lik: -7692.281, Max-Change: 0.03204  
Iteration: 15, Log-Lik: -7691.778, Max-Change: 0.02791  
Iteration: 16, Log-Lik: -7690.792, Max-Change: 0.02318  
Iteration: 17, Log-Lik: -7690.649, Max-Change: 0.01802  
Iteration: 18, Log-Lik: -7690.544, Max-Change: 0.01396  
Iteration: 19, Log-Lik: -7690.346, Max-Change: 0.00841  
Iteration: 20, Log-Lik: -7690.310, Max-Change: 0.00796  
Iteration: 21, Log-Lik: -7690.284, Max-Change: 0.00834  
Iteration: 22, Log-Lik: -7690.195, Max-Change: 0.00303  
Iteration: 23, Log-Lik: -7690.187, Max-Change: 0.00116  
Iteration: 24, Log-Lik: -7690.186, Max-Change: 0.00127  
Iteration: 25, Log-Lik: -7690.183, Max-Change: 0.00140  
Iteration: 26, Log-Lik: -7690.183, Max-Change: 0.00020  
Iteration: 27, Log-Lik: -7690.183, Max-Change: 0.00113  
Iteration: 28, Log-Lik: -7690.182, Max-Change: 0.00024  
Iteration: 29, Log-Lik: -7690.182, Max-Change: 0.00036  
Iteration: 30, Log-Lik: -7690.182, Max-Change: 0.00018  
Iteration: 31, Log-Lik: -7690.182, Max-Change: 0.00015  
Iteration: 32, Log-Lik: -7690.182, Max-Change: 0.00031  
Iteration: 33, Log-Lik: -7690.182, Max-Change: 0.00050  
Iteration: 34, Log-Lik: -7690.182, Max-Change: 0.00033  
Iteration: 35, Log-Lik: -7690.182, Max-Change: 0.00047  
Iteration: 36, Log-Lik: -7690.182, Max-Change: 0.00022  
Iteration: 37, Log-Lik: -7690.182, Max-Change: 0.00017  
Iteration: 38, Log-Lik: -7690.182, Max-Change: 0.00026  
Iteration: 39, Log-Lik: -7690.182, Max-Change: 0.00013  
Iteration: 40, Log-Lik: -7690.182, Max-Change: 0.00053  
Iteration: 41, Log-Lik: -7690.182, Max-Change: 0.00025  
Iteration: 42, Log-Lik: -7690.182, Max-Change: 0.00036  
Iteration: 43, Log-Lik: -7690.182, Max-Change: 0.00030  
Iteration: 44, Log-Lik: -7690.181, Max-Change: 0.00042  
Iteration: 45, Log-Lik: -7690.181, Max-Change: 0.00020  
Iteration: 46, Log-Lik: -7690.181, Max-Change: 0.00015  
Iteration: 47, Log-Lik: -7690.181, Max-Change: 0.00025  
Iteration: 48, Log-Lik: -7690.181, Max-Change: 0.00058  
Iteration: 49, Log-Lik: -7690.181, Max-Change: 0.00029  
Iteration: 50, Log-Lik: -7690.181, Max-Change: 0.00041  
Iteration: 51, Log-Lik: -7690.181, Max-Change: 0.00022  
Iteration: 52, Log-Lik: -7690.181, Max-Change: 0.00017  
Iteration: 53, Log-Lik: -7690.181, Max-Change: 0.00026  
Iteration: 54, Log-Lik: -7690.181, Max-Change: 0.00011  
Iteration: 55, Log-Lik: -7690.181, Max-Change: 0.00046  
Iteration: 56, Log-Lik: -7690.181, Max-Change: 0.00025  
Iteration: 57, Log-Lik: -7690.181, Max-Change: 0.00035  
Iteration: 58, Log-Lik: -7690.181, Max-Change: 0.00026  
Iteration: 59, Log-Lik: -7690.181, Max-Change: 0.00037  
Iteration: 60, Log-Lik: -7690.181, Max-Change: 0.00019  
Iteration: 61, Log-Lik: -7690.181, Max-Change: 0.00015  
Iteration: 62, Log-Lik: -7690.181, Max-Change: 0.00023  
Iteration: 63, Log-Lik: -7690.181, Max-Change: 0.00010  
Iteration: 64, Log-Lik: -7690.181, Max-Change: 0.00041  
Iteration: 65, Log-Lik: -7690.181, Max-Change: 0.00022  
Iteration: 66, Log-Lik: -7690.181, Max-Change: 0.00031  
Iteration: 67, Log-Lik: -7690.181, Max-Change: 0.00022  
Iteration: 68, Log-Lik: -7690.181, Max-Change: 0.00032  
Iteration: 69, Log-Lik: -7690.181, Max-Change: 0.00017  
Iteration: 70, Log-Lik: -7690.181, Max-Change: 0.00013  
Iteration: 71, Log-Lik: -7690.181, Max-Change: 0.00020  
Iteration: 72, Log-Lik: -7690.181, Max-Change: 0.00044  
Iteration: 73, Log-Lik: -7690.181, Max-Change: 0.00025  
Iteration: 74, Log-Lik: -7690.180, Max-Change: 0.00036  
Iteration: 75, Log-Lik: -7690.180, Max-Change: 0.00017  
Iteration: 76, Log-Lik: -7690.180, Max-Change: 0.00013  
Iteration: 77, Log-Lik: -7690.180, Max-Change: 0.00020  
Iteration: 78, Log-Lik: -7690.180, Max-Change: 0.00010  
Iteration: 1, Log-Lik: -8498.671, Max-Change: 1.82062  
Iteration: 2, Log-Lik: -7982.028, Max-Change: 1.50437  
Iteration: 3, Log-Lik: -7893.620, Max-Change: 1.38405  
Iteration: 4, Log-Lik: -7878.756, Max-Change: 0.46578  
Iteration: 5, Log-Lik: -7873.403, Max-Change: 0.32762  
Iteration: 6, Log-Lik: -7871.184, Max-Change: 0.24690  
Iteration: 7, Log-Lik: -7869.906, Max-Change: 0.10435  
Iteration: 8, Log-Lik: -7868.928, Max-Change: 0.04065  
Iteration: 9, Log-Lik: -7868.732, Max-Change: 0.03578  
Iteration: 10, Log-Lik: -7868.598, Max-Change: 0.02161  
Iteration: 11, Log-Lik: -7868.546, Max-Change: 0.01329  
Iteration: 12, Log-Lik: -7868.515, Max-Change: 0.00876  
Iteration: 13, Log-Lik: -7868.483, Max-Change: 0.00641  
Iteration: 14, Log-Lik: -7868.473, Max-Change: 0.01232  
Iteration: 15, Log-Lik: -7868.467, Max-Change: 0.00449  
Iteration: 16, Log-Lik: -7868.465, Max-Change: 0.00407  
Iteration: 17, Log-Lik: -7868.462, Max-Change: 0.00334  
Iteration: 18, Log-Lik: -7868.460, Max-Change: 0.00251  
Iteration: 19, Log-Lik: -7868.457, Max-Change: 0.00174  
Iteration: 20, Log-Lik: -7868.457, Max-Change: 0.00077  
Iteration: 21, Log-Lik: -7868.456, Max-Change: 0.00027  
Iteration: 22, Log-Lik: -7868.456, Max-Change: 0.00024  
Iteration: 23, Log-Lik: -7868.456, Max-Change: 0.00066  
Iteration: 24, Log-Lik: -7868.456, Max-Change: 0.00087  
Iteration: 25, Log-Lik: -7868.456, Max-Change: 0.00096  
Iteration: 26, Log-Lik: -7868.456, Max-Change: 0.00030  
Iteration: 27, Log-Lik: -7868.456, Max-Change: 0.00070  
Iteration: 28, Log-Lik: -7868.456, Max-Change: 0.00076  
Iteration: 29, Log-Lik: -7868.456, Max-Change: 0.00021  
Iteration: 30, Log-Lik: -7868.456, Max-Change: 0.00033  
Iteration: 31, Log-Lik: -7868.456, Max-Change: 0.00020  
Iteration: 32, Log-Lik: -7868.456, Max-Change: 0.00030  
Iteration: 33, Log-Lik: -7868.456, Max-Change: 0.00012  
Iteration: 34, Log-Lik: -7868.456, Max-Change: 0.00009  
Iteration: 1, Log-Lik: -8559.166, Max-Change: 1.15457  
Iteration: 2, Log-Lik: -8261.016, Max-Change: 1.07244  
Iteration: 3, Log-Lik: -7984.732, Max-Change: 1.08920  
Iteration: 4, Log-Lik: -7926.792, Max-Change: 0.62189  
Iteration: 5, Log-Lik: -7900.386, Max-Change: 0.48898  
Iteration: 6, Log-Lik: -7886.005, Max-Change: 0.34083  
Iteration: 7, Log-Lik: -7882.462, Max-Change: 0.25247  
Iteration: 8, Log-Lik: -7880.238, Max-Change: 0.19805  
Iteration: 9, Log-Lik: -7879.211, Max-Change: 0.08439  
Iteration: 10, Log-Lik: -7878.812, Max-Change: 0.06210  
Iteration: 11, Log-Lik: -7878.483, Max-Change: 0.04913  
Iteration: 12, Log-Lik: -7878.303, Max-Change: 0.03704  
Iteration: 13, Log-Lik: -7878.066, Max-Change: 0.00846  
Iteration: 14, Log-Lik: -7878.054, Max-Change: 0.00649  
Iteration: 15, Log-Lik: -7878.046, Max-Change: 0.00530  
Iteration: 16, Log-Lik: -7878.036, Max-Change: 0.00308  
Iteration: 17, Log-Lik: -7878.030, Max-Change: 0.00171  
Iteration: 18, Log-Lik: -7878.029, Max-Change: 0.00126  
Iteration: 19, Log-Lik: -7878.028, Max-Change: 0.00057  
Iteration: 20, Log-Lik: -7878.028, Max-Change: 0.00057  
Iteration: 21, Log-Lik: -7878.028, Max-Change: 0.00016  
Iteration: 22, Log-Lik: -7878.028, Max-Change: 0.00013  
Iteration: 23, Log-Lik: -7878.028, Max-Change: 0.00037  
Iteration: 24, Log-Lik: -7878.028, Max-Change: 0.00015  
Iteration: 25, Log-Lik: -7878.028, Max-Change: 0.00009  
Iteration: 1, Log-Lik: -8814.597, Max-Change: 0.76028  
Iteration: 2, Log-Lik: -8562.729, Max-Change: 0.70643  
Iteration: 3, Log-Lik: -8211.706, Max-Change: 1.11629  
Iteration: 4, Log-Lik: -8089.005, Max-Change: 0.67600  
Iteration: 5, Log-Lik: -8068.983, Max-Change: 0.21466  
Iteration: 6, Log-Lik: -8064.040, Max-Change: 0.12707  
Iteration: 7, Log-Lik: -8062.444, Max-Change: 0.07075  
Iteration: 8, Log-Lik: -8061.879, Max-Change: 0.05138  
Iteration: 9, Log-Lik: -8061.582, Max-Change: 0.03622  
Iteration: 10, Log-Lik: -8061.334, Max-Change: 0.01440  
Iteration: 11, Log-Lik: -8061.299, Max-Change: 0.01192  
Iteration: 12, Log-Lik: -8061.281, Max-Change: 0.00764  
Iteration: 13, Log-Lik: -8061.265, Max-Change: 0.00337  
Iteration: 14, Log-Lik: -8061.262, Max-Change: 0.00247  
Iteration: 15, Log-Lik: -8061.260, Max-Change: 0.00205  
Iteration: 16, Log-Lik: -8061.259, Max-Change: 0.00064  
Iteration: 17, Log-Lik: -8061.259, Max-Change: 0.00054  
Iteration: 18, Log-Lik: -8061.259, Max-Change: 0.00024  
Iteration: 19, Log-Lik: -8061.259, Max-Change: 0.00019  
Iteration: 20, Log-Lik: -8061.259, Max-Change: 0.00041  
Iteration: 21, Log-Lik: -8061.259, Max-Change: 0.00014  
Iteration: 22, Log-Lik: -8061.259, Max-Change: 0.00011  
Iteration: 23, Log-Lik: -8061.259, Max-Change: 0.00033  
Iteration: 24, Log-Lik: -8061.259, Max-Change: 0.00009

# rbind.fill doesn't support row names, so rejoin those  
rownames(ipar) <- rows  
  
# Load item parameters used to simulate item level data  
opar <- read.table("resources/ipar.dat", header=T, row.names=1)  
  
# Compute the difference between recovered item parameters and those  
# used to simulate the data.  
iptest <- abs(ipar) - abs(opar)  
  
# Check max differnece  
max(iptest, na.rm=T)

## [1] 2.597

# print to console  
iptest

## a1 d1 d2 d3 d4 d5 d6  
## HSinc1 -0.051 0.388 0.003 -0.160 -0.126 0.105 -0.014  
## HSinc2 -0.116 -0.283 -0.148 0.128 -0.186 -0.058 1.069  
## HSinc3 -0.083 0.004 0.007 0.164 -0.093 -0.026 -0.225  
## HSinc4 -0.094 -0.261 -0.099 -0.072 -0.066 0.249 -0.047  
## HSinc5 0.009 -0.141 -0.159 0.125 0.090 0.172 0.018  
## HSinc6 -0.273 -0.254 -0.273 0.139 0.082 0.155 -0.122  
## HSinc7 0.025 -0.009 0.049 0.021 -0.014 0.024 -0.017  
## HSinc8 -0.155 0.336 0.125 -0.019 -0.051 -0.063 -0.001  
## HSinc9 0.048 -0.029 0.048 -0.081 0.026 0.061 -0.011  
## HSinc10 -0.061 0.020 -0.062 -0.052 -0.002 0.117 0.257  
## HFair1 -0.126 -0.416 -0.505 -0.417 -0.256 0.133 -0.014  
## HFair2 0.073 -0.145 0.286 0.055 -0.089 -0.073 0.176  
## HFair3 -0.044 0.079 0.067 -0.135 -0.085 0.101 0.146  
## HFair4 0.297 0.091 -0.080 -0.241 -0.047 -0.154 0.187  
## HFair5 0.075 0.639 0.094 0.085 -0.055 0.024 -0.017  
## HFair6 0.110 -0.081 -0.039 -0.065 -0.021 0.048 -0.034  
## HFair7 0.065 0.150 -0.216 -0.121 -0.103 0.024 -0.133  
## HFair8 -0.036 0.282 -0.382 -0.334 -0.254 -0.186 -0.339  
## HFair9 -0.105 0.015 -0.079 -0.069 0.000 0.211 NA  
## HFair10 0.122 0.033 0.042 0.083 0.221 0.154 -0.028  
## EAnxi1 -0.121 0.121 0.133 0.023 -0.037 0.139 -0.042  
## EAnxi2 0.082 0.677 0.202 0.568 0.532 0.130 -0.068  
## EAnxi3 0.168 0.757 0.422 0.255 0.071 -0.041 0.251  
## EAnxi4 -0.012 0.470 0.048 -0.013 0.042 0.010 -0.022  
## EAnxi5 -0.210 -0.154 0.012 0.236 -0.229 -0.032 -0.074  
## EAnxi6 0.114 0.002 0.025 0.321 0.219 0.324 0.407  
## EAnxi7 -0.021 -0.070 -0.004 -0.017 -0.011 0.152 0.138  
## EAnxi8 -0.157 -0.097 0.083 -0.002 -0.005 0.111 0.091  
## EAnxi9 -0.045 0.144 -0.163 0.016 -0.016 0.239 0.093  
## EAnxi10 0.073 -0.049 -0.075 0.091 0.114 0.068 0.214  
## EDepe1 -0.083 -0.243 0.202 0.110 0.045 -0.092 0.139  
## EDepe2 -0.057 -0.016 -0.102 0.006 -0.025 -0.170 -0.302  
## EDepe3 -0.393 -0.086 -0.275 -0.181 -0.151 -0.066 0.159  
## EDepe4 -0.057 -0.022 0.089 -0.036 0.088 0.044 0.035  
## EDepe5 0.018 -0.357 0.071 0.065 0.004 0.168 0.009  
## EDepe6 -0.102 0.000 -0.011 -0.024 0.087 -0.013 -0.124  
## EDepe7 0.005 0.288 0.166 0.036 0.034 -0.027 0.043  
## EDepe8 0.056 0.009 -0.095 -0.182 -0.174 0.095 0.087  
## EDepe9 -0.131 -0.067 -0.027 0.205 0.118 0.111 0.011  
## EDepe10 -0.045 -0.049 0.030 0.132 0.184 0.025 0.129  
## XLive1 -0.297 -0.157 -0.214 -0.015 -0.100 -0.112 0.184  
## XLive2 -0.060 -0.045 0.024 0.184 -0.039 -0.087 0.153  
## XLive3 -0.145 -0.483 -0.234 -0.089 0.230 -0.047 -0.005  
## XLive4 -0.194 -0.048 0.043 -0.060 -0.142 0.187 0.035  
## XLive5 0.098 0.051 -0.054 -0.059 0.208 0.201 0.324  
## XLive6 -0.073 -0.011 0.153 -0.066 -0.113 0.000 0.046  
## XLive7 0.015 -0.201 -0.003 -0.136 -0.110 0.151 0.146  
## XLive8 0.029 0.161 0.152 0.169 0.140 0.117 0.159  
## XLive9 -0.121 -0.092 0.121 0.166 0.227 -0.246 -0.205  
## XLive10 0.038 0.135 0.250 0.081 0.000 0.099 0.295  
## AForg1 -0.032 -0.144 -0.179 0.163 0.166 0.149 0.787  
## AForg2 0.213 0.501 0.060 -0.060 0.070 0.044 0.456  
## AForg3 -0.136 -0.506 -0.321 -0.250 -0.147 0.249 0.292  
## AForg4 -0.064 0.198 -0.209 -0.109 -0.149 -0.133 -0.084  
## AForg5 0.592 0.904 0.562 0.436 0.043 0.073 0.233  
## AForg6 -0.111 -0.147 0.080 0.128 0.204 -0.314 -0.246  
## AForg7 -0.019 -0.043 0.126 -0.008 -0.001 -0.035 0.190  
## AForg8 0.088 0.226 -0.035 0.046 -0.109 -0.004 0.237  
## AForg9 0.031 0.207 0.315 0.214 0.091 0.007 -0.090  
## AForg10 -0.097 0.102 0.080 0.120 0.053 -0.108 -0.071  
## APati1 -0.008 0.455 0.193 0.242 0.151 -0.073 -0.163  
## APati2 -0.404 -0.144 0.044 0.133 -0.146 -0.273 -0.585  
## APati3 -0.068 0.081 -0.115 -0.142 -0.036 -0.029 -0.200  
## APati4 -0.091 -0.004 0.255 0.042 0.198 0.094 -0.082  
## APati5 -0.331 -0.080 0.129 0.152 -0.183 -0.230 -0.259  
## APati6 -0.019 0.366 0.004 -0.059 -0.016 0.329 0.443  
## APati7 -0.071 0.135 -0.125 0.060 -0.018 -0.127 0.223  
## APati8 -0.327 -0.276 -0.206 0.016 -0.032 0.129 -0.089  
## APati9 -0.046 0.253 0.013 0.046 0.068 0.068 0.174  
## APati10 -0.024 -0.148 -0.163 -0.077 0.119 -0.063 0.011  
## CPerf1 0.649 2.597 0.978 0.523 0.332 0.033 0.708  
## CPerf2 -0.118 0.003 -0.039 -0.041 -0.027 0.076 0.055  
## CPerf3 0.066 0.167 -0.164 0.110 0.022 0.203 0.433  
## CPerf4 0.207 0.331 0.101 0.065 -0.089 0.127 0.204  
## CPerf5 -0.008 0.158 0.060 0.103 0.026 0.047 0.042  
## CPerf6 -0.071 -0.465 -0.230 0.005 0.036 0.100 0.111  
## CPerf7 0.016 -0.058 -0.170 -0.202 -0.056 0.104 0.177  
## CPerf8 -0.116 -0.517 -0.302 -0.333 -0.211 0.079 0.096  
## CPerf9 0.198 0.362 0.094 0.107 0.238 0.334 0.639  
## CPerf10 -0.129 -0.528 -0.050 -0.046 -0.028 0.134 0.283  
## OInqu1 -0.072 -0.061 0.224 0.107 0.068 0.065 0.046  
## OInqu2 -0.082 0.503 -0.335 -0.207 -0.202 -0.012 -0.023  
## OInqu3 0.037 -0.033 0.109 -0.097 0.070 -0.104 0.114  
## OInqu4 0.298 0.899 1.041 0.527 0.076 -0.139 0.218  
## OInqu5 -0.158 -0.454 -0.290 -0.237 -0.017 0.101 -0.028  
## OInqu6 0.039 1.204 1.051 0.698 0.456 0.294 -0.072  
## OInqu7 -0.022 0.011 -0.024 0.112 0.097 0.037 -0.279  
## OInqu8 -0.090 0.077 0.335 0.218 0.214 -0.189 -0.507  
## OInqu9 -0.071 -0.033 0.009 0.051 0.078 0.084 0.190  
## OInqu10 -0.128 -0.016 -0.176 -0.144 -0.117 -0.189 -0.330  
## OUnco1 0.122 0.132 -0.023 -0.028 -0.077 0.027 0.019  
## OUnco2 -0.137 -0.478 -0.108 -0.256 0.007 0.005 -0.080  
## OUnco3 0.046 0.383 0.630 0.046 0.087 0.173 -0.082  
## OUnco4 -0.066 -0.090 -0.041 0.122 -0.016 0.030 0.125  
## OUnco5 0.056 0.779 0.133 0.154 -0.141 0.158 0.158  
## OUnco6 -0.315 0.065 -0.230 -0.358 -0.331 -0.350 -0.386  
## OUnco7 -0.185 0.024 0.080 -0.057 -0.042 -0.211 0.103  
## OUnco8 0.113 0.474 0.046 0.041 0.028 -0.040 -0.297  
## OUnco9 0.299 0.300 -0.231 -0.046 0.018 0.017 0.471  
## OUnco10 0.076 -0.091 -0.009 -0.026 -0.034 -0.031 0.544

# Write to file  
write.table(iptest, "cyw/iptest.dat")