

# Cognitive ability, character skills, and learning to play equilibrium: A level- $k$ analysis

## Instructions for Code and Data

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### 1 z-Tree code

The experiment was coded in z-Tree version 3.3.3. The folder **ZtreeCodeDistribution** contains the five **.ztt** that were used to run the experiment. The function of each file is as follows:

<code>Treatment_70_IQInvMatch_18.ztt</code>	Collects Raven test scores and beauty contest choices from 18 subjects divided into 6 cross-matched groups.
<code>Treatment_70_IQInvMatch.ztt</code>	Collects Raven test scores and beauty contest choices from 24 subjects divided into 8 cross-matched groups.
<code>Treatment_70_IQMatch_18.ztt</code>	Collects Raven test scores and beauty contest choices from 18 subjects divided into 6 own-matched groups.
<code>Treatment_70_IQMatch.ztt</code>	Collects Raven test scores and beauty contest choices from 24 subjects divided into 8 own-matched groups.
<code>Treatment_70_IQMatch_Personality_18.ztt</code>	Collects Raven test scores, personality measures and beauty contest choices from 18 subjects divided into 6 own-matched groups.

### 2 Data

The file **AppendedData.dta** contains the experimental dataset. This file is located in the folder called “StataCodeDistribution”. The variable names and definitions are as follows:

session	Session identifier
subject	Subject identifier
period	Round number
p	$p$ -beauty contest parameter
score	Raven test score
median	Session median of Raven test scores
upper	Indicator for high ability
ownmatch	Indicator for being in own-matched group
bc	Number chosen in beauty contest
g	Within session group identifier
x	Indicator for being subject x
y	Indicator for being subject y
z	Indicator for being subject z
bcx	Choice of subject x
bcy	Choice of subject y
bcz	Choice of subject z
winner	Indicator for being winner
winnerx	Indicator for subject x being winner
winnery	Indicator for subject y being winner
winnerz	Indicator for subject z being winner
numwinners	Number of winning subjects
prize	Value of prize won
prizex	Value of prize won by subject x
prizey	Value of prize won by subject y
prizez	Value of prize won by subject z
topay	Cumulative experimental earnings (including show-up fee)
year	Year of data collection
p1 – p68	Response to personality questions 1-68
sex	Self-reported gender (1=not reported; 2=female; 3=male)
mu	Fraction of high ability subjects in the group

### 3 Stata code

We use Stata for graphing, descriptive analysis and regression analysis. The code was written in Stata/SE version 12.1. The Stata code can be found in the folder called “StataCodeDistribution”.

The file `StataAnalysis_Descriptives1.do` provides code for the analysis presented in Sections 2 and 3 (except Figures 5 and 6) and Appendices C and D. This file calls `RF_Revised_Setup_030614.do`, which constructs additional variables.

The file `StataAnalysis_GroupByGroupPlots.do` provides code to draw the group-by-group plots of choices and winners that appear in Figures 5 and 6 in the main text and in Section 2 of the Supplementary Web Appendix. This file calls `AllGroupPlots.do`.

The file `StataAnalysis_Descriptives2.do` provides code for the analysis presented in Sections 5.1 and 5.2. This file calls `RF_New_Setup_030614.do`, which constructs additional variables.

The file `FitPlots.do` provides code to draw the goodness of fit plots that appear in Figures 7 and 8.

The file `AppendixA.do` provides code to produce the tables in Appendix A and the numbers discussed in the final paragraph of Appendix A. The file `AppendixA_MC.do` provides code to run the Monte Carlo experiment discussed in Appendix A.

The file `AppendixE.do` provides code to produce the table in Appendix E. This file also calls `RF_New_Setup_030614.do`.

## 4 Matlab code

We use Matlab for structural estimation and post-estimation simulations. The code was written in Matlab R2013a. The Matlab code can be found in the folder called “MatlabCodeDistribution”, which contains three subfolders: “MainModel”; “CharacterSkills”; and “EWA”. We describe below the contents of each of these subfolders.

### 4.1 MainModel

The function `Run.m` runs the estimation of the level- $k$  mixture of types model introduced in Section 4 of the paper. This function can be used to estimate the preferred specification and the 8 alternative specification described Appendix B. The function `Run.m` has one argument, `bs`, which determines the seed used in the Monte Carlo experiment. This value of this parameter is irrelevant to the other estimations. The function `Run.m` returns the structure variable `x` with the following fields:

Table1, Table2,...,Table17	Tables of estimation results and goodness of fit statistics
H	Hessian
EbetaOwn	Vector of parameter estimates
Liki	Vector of group-level log likelihood contributions

The function `Run_bs_wrapper.m` implements the Monte Carlo experiment discussed in footnote 26.

### 4.2 CharacterSkills

The function `Run.m` runs the estimation of the level- $k$  mixture of types model with character skills discussed in Section 5.3.

### 4.3 EWA

The function `Run.m` runs the estimation of the EWA model discussed in Appendix B (see Alternative Specification 8).