Study 2: Reinforcement-Punishment Analysis

Debbie Yee

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Study 2: Within-Subjects Reinforcement and Punishment Effects of Liquid and Monetary Incentives

This is an analysis of the subject performance of study 2 of reinforcement and punishment effects of liquid feedback with monetary gains and losses. In the study, subjects perform the cued task-switching paradigm, where they have classify a letter (vowel/consonant) or digit (odd/even). During the baseline runs, they don't receive any feedback and are told to respond "as quickly and accurate as possible." During the incentive runs, they receive a drop of liquid (1 or 2 mL) to indicate successful attainment of monetary reward in a single trial. Each subject performs 6 incentive runs: 3 reinforcement (all liquids and monetary gains) and 3 punishment avoidance (all liquids and avoidance of monetary losses). Liquids are blocked.

Criterion RT is calculated on subject performance during the baseline run (30%), and is the same for both reinforcement and punishment conditions.

Loading relevant packages

```
library(ggplot2)
library(gridExtra)
library(dplyr)
library(tidyr)
library(lme4)
library(lmerTest)
library(sjPlot)
source("/Users/debbieyee/Dropbox/CCPLabProjects/Liquid_Feedback/OAYA_Combined/Analysis/Yee/summarySEwit
```

Path directories of data input/output

```
# data directories
data.path<-paste0("/Users/debbieyee/Dropbox/CCPLabProjects/Liquid_Feedback/",
               "Reinforce-Punish_Combined/Study2/Data/SubjectData/TrimmedData/",
               "Study2_ConsolidatedRewardData.csv")
runkey.path<-paste0("/Users/debbieyee/Dropbox/CCPLabProjects/Liquid_Feedback/",
                 "Reinforce-Punish_Combined/Study2/Data/SubjectData/TrimmedData/",
                 "Study2_ConsolidateRunKey.csv")
figure.path<-paste0("/Users/debbieyee/Dropbox/CCPLabProjects/Liquid_Feedback/",
                 "Reinforce-Punish_Combined/Study2/Analysis/Figures/")
```

Format the data for analysis

```r
# Read in the data
data<-read.csv(data.path,header = TRUE)
runkey<-read.csv(runkey.path, header = TRUE)

# Formatting incentive data
data<-select(runkey)
```