

Analyzing children's interactions in a Repeated Prisoner's Dilemma Game

Team 1

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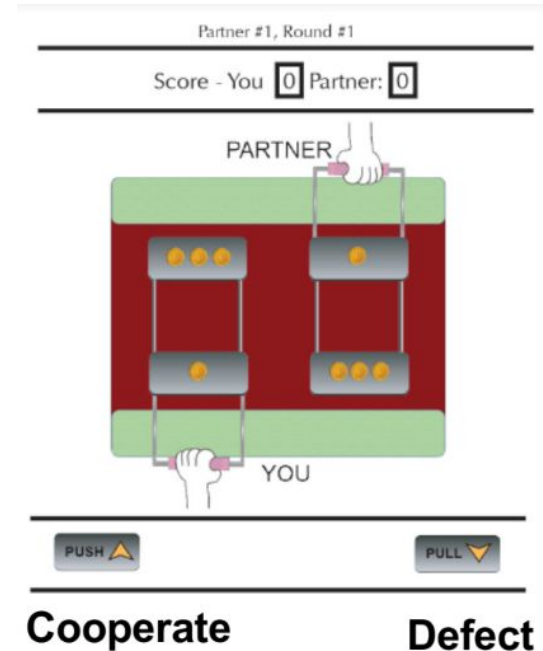
Our objective

To study children's social interactions and understand what cognitive and social factors affect children's aggressive versus forgiving responses.

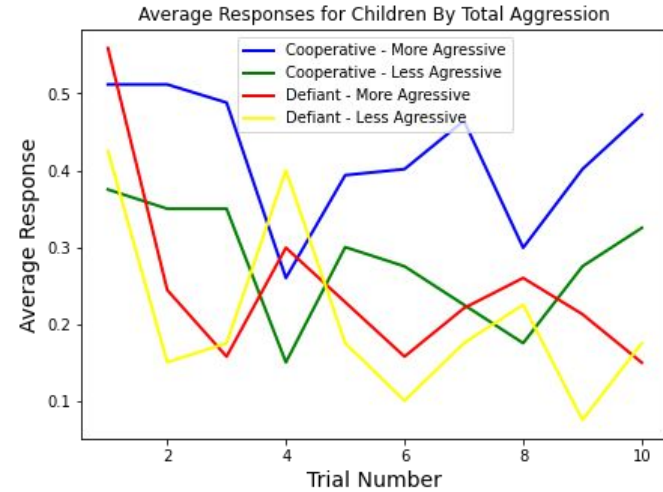
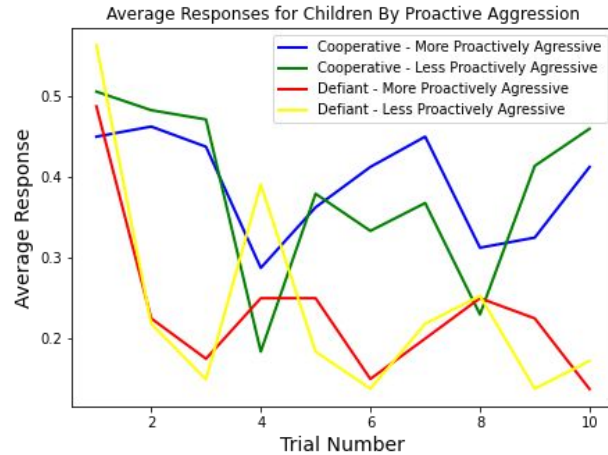
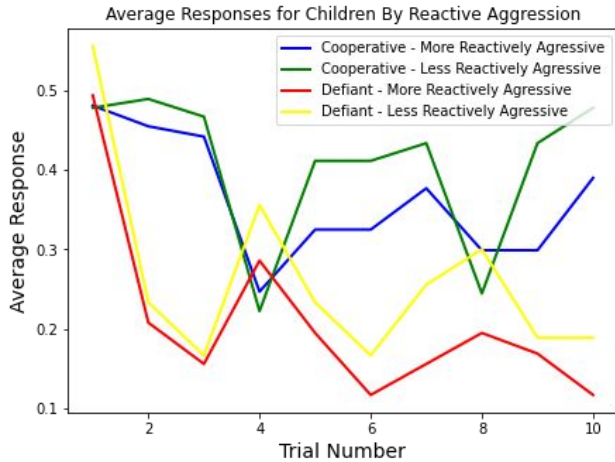


The Repeated prisoner's dilemma game

- 10 round game
- 3 types of pre-programmed partners:
 - Cooperative
 - Defects on rounds 3 and 7
 - Tit-for-tat
 - Cooperates in the 1st round and then just copies what the child did in the previous round.
 - Defecting
 - Cooperates on round 3 and 7

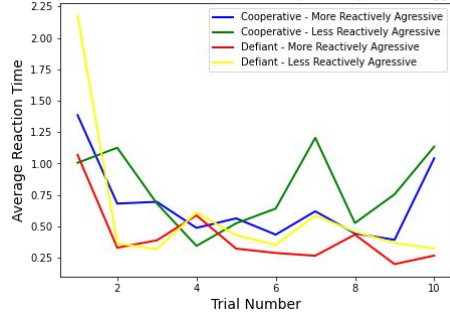


Preliminary Analysis Graphs

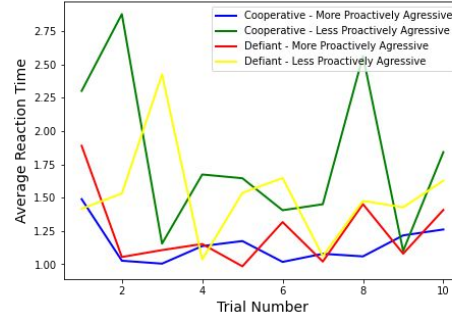


Reaction Time Graphs

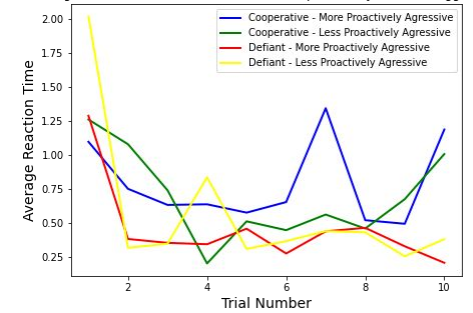
Average Reaction Times for Children Who Cooperated By Reactive Aggression



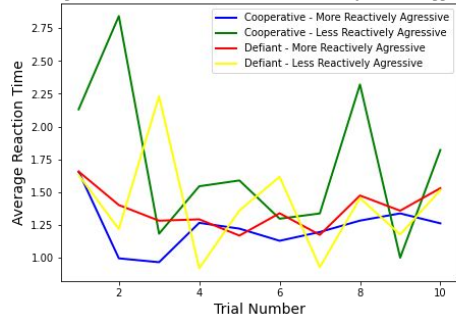
Average Reaction Times for Children Who Defected By Proactive Aggression



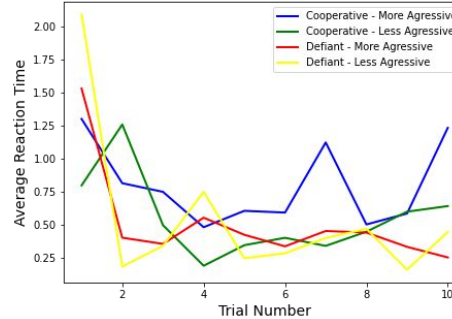
Average Reaction Times for Children Who Cooperated By Proactive Aggression



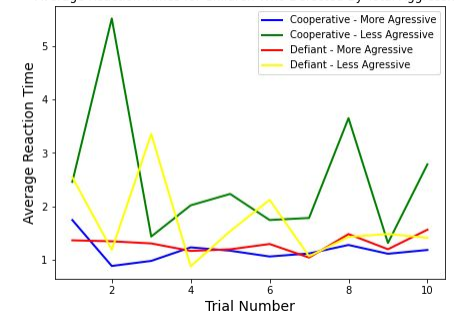
Average Reaction Times for Children Who Defected By Reactive Aggression



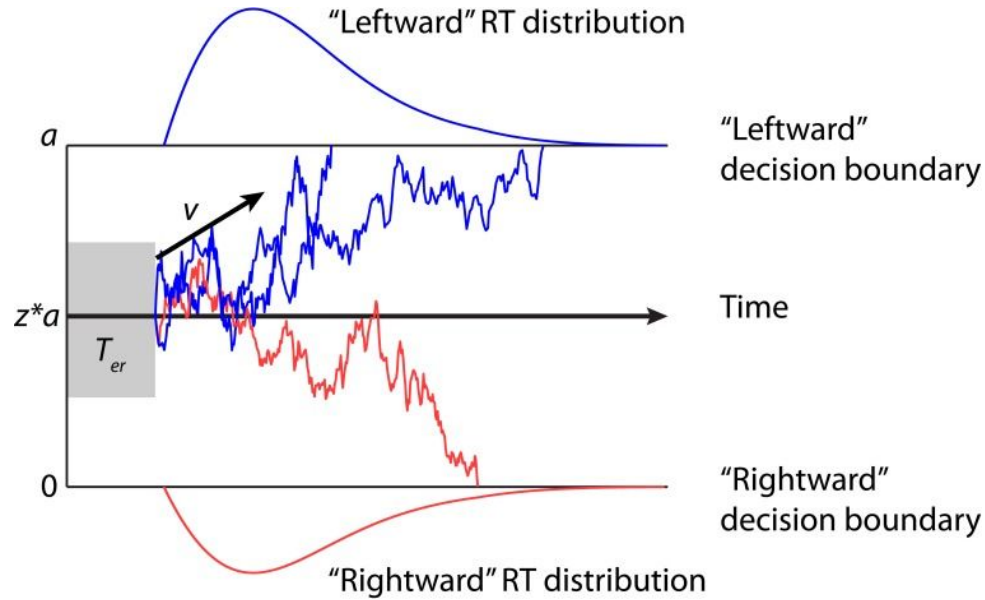
Average Reaction Times for Children Who Cooperated By Total Aggression



Average Reaction Times for Children Who Defected By Total Aggression



Drift Diffusion Model



Moving Away from Drift Diffusion Model

- Reaction times are much longer than 1000-1500 ms, which is the ideal range for the DDM
- The decisions made in this experiment are not one-step intuitive decisions but rather a process that requires reasoning and strategy planning

Models Tested to predict Aggression Levels:

- Logistic Regression
- Linear Regression, Support Vector Regression and Random Forest Regression

Current Results on Models tested:

Given the limited size of the data set and lack of variability in player choices, our predictions are not accurate so far.

Next Steps

Long Short Term Memory (LSTM) neural network

Bayesian statistical model (eg. using libraries such as PyMC3).

Limitations

Very small dataset → Difficult to train accurate models using the available data.