A pilot study analyzing nonverbal behavior during an iterative social interactive trust game

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Background

Neuroeconomics is a relatively new, yet growing discipline which aims to combine behavioral economic theories and neuroscientific methods to better understand incentivized decision making.

A multi-round trust game guided by game theoretical principles has been used pervasively as a method of investigating social decision making. It has been shown to be helpful in discriminating psychiatric from normal populations[1].

Past studies have shown that the behavior of clinical populations during a trust game differ when playing with an anonymous partner as opposed to with a known partner where identities are revealed. Most notably, the participants are more benevolent when playing under known conditions[2]. However, studies have not yet accounted for this difference.

The present limits to the trust task only allow for the analysis of neural activity during social exchange. Particularly, the task does not account for nonverbal information during the game.

Borderline Personality Disorder (BPD) is a disorder known for its anomalies in trust behavior. BPD patients have difficulties in forming and maintaining cooperative relationships and account for up to 10 % of patients in psychiatric care[3].

Objectives

The aim of this study is to pilot new methodology developed in the Quantitative Imaging Laboratory (QIL) to assess nonverbal signals during the trust game.

In this portion of the study, the objective was to develop and finalize the technology and methodology for the adapted trust task. Moreover, questionnaires useful in assessing the validity of the trust task were selected.

This novel method introducing the nonverbal variable in a social context may help in the early identification of psychiatric disorders, particularly BPD.

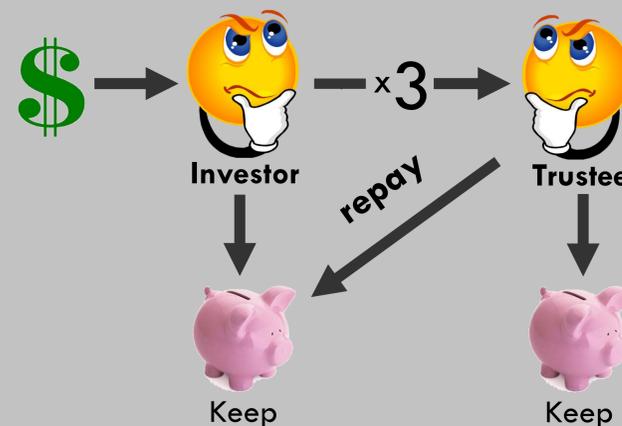## Measures

Trust Task

Figure 1: *In the trust game, the Investor is endowed with a certain amount of money (points). The Investor can keep all the money or invest some amount with the partner (the Trustee). The amount invested is tripled in value as it is sent to the Trustee, who then decides what portion to return to the Investor. This is repeated for 10 rounds.*
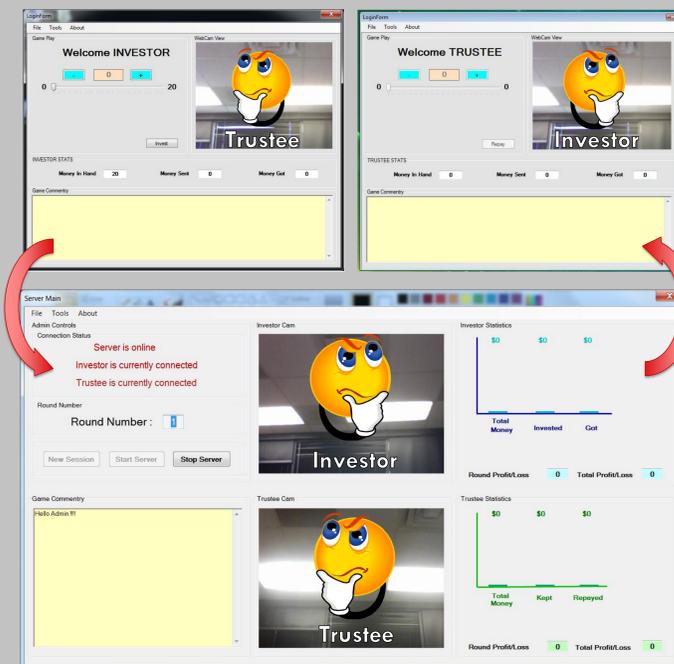

Figure 2: *The adapted trust game consists of three separate interfaces, one each for the Investor (top left), the Trustee (top right), and the Administrator (bottom, Admin). As the game is running, the players' activities communicate via the Admin server, which tracks and records the investments and returns of each round. The two players are able to see each other using a Skype™-like interface, but cannot otherwise communicate. The server captures images from the Investor and Trustee cameras at a rate of 5 fps.*

Questionnaires

Adult Eyes Test (AET)

•playful   •irritated   •terrified   •arrogant   •joking   •desire
•comforting   •bored   •upset   •annoyed   •flustered   •convinced

Figure 3: *Three images taken from the AET in which participants must choose one of four words that best describes what the person in the photo is feeling/experiencing.*

Movie for the Assessment of Social Cognition (MASC)

Still images from Scene 1

1. What is Sandra feeling?
a. her hair does not look that nice
b. she is pleased about his compliment
c. she is exasperated about Michael coming on too strong
d. she is flattered but somewhat taken by surprise

Figure 4: *MASC consists of a 15-minute movie broken down into 46 clips. Following each clip, the individual is to answer a question regarding what the characters think and feel. This is a measurement of mentalization – higher scores indicate good mentalizing.*

Future Aims

Now that the technology for the trust task has been finalized, the next phase of the study will focus on recruitment and data collection. Participants aged 18-25 will be recruited through the UH Psychology Department to play the trust game and complete the series of questionnaires.

Upon completion of data collection, image analysis will be run on the data set through the QIL to assess human motion dynamics and to understand nonverbal signals during the social exchange.

References and Acknowledgements

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