Altruism, Charity, and the Brain

Dharol Tankersley¹,³, C. Jill Stowe⁴, & Scott A. Huettel¹,²

¹Brain Imaging and Analysis Center, ²Psychiatry, Duke University Medical Center, ³Philosophy and ⁴Fuqua School of Business, Duke University

www.biac.duke.edu neuroeconomics.duke.edu

ALTRUISM

Most studies of reward-guided behavior have used personally rewarding stimuli (e.g., money, food). In the natural environment, however, behaviors are often performed without personal reward.

The existence of such altruistic behaviors raises questions:
- Why are some people more altruistic than others?
- Are socially rewarding stimuli processed using similar neural systems as personally rewarding stimuli (e.g., money, food)?
- Does self-reported altruism mediate brain processing during reward-guided actions?

Here, we investigate how personally and socially directed actions differentially influence brain systems for decision making and social cognition.

METHODS

1. Overview of the Experiment

- Participants: 27 young adults (mean age: 24y; 13 female)
- Subjects performed a response-time task to earn money for themselves or a selected charity
- fMRI data acquisition: 3T GE Scanner (TR: 1.5s; TE: 30ms; 34 axial slices)
- Data analysis: Preprocessing using SPM steps; identification of active voxels using area under curve measures and second-level analyses
- Altruism ratings: Subjects completed the Self-Report Altruism Scale (Rushton)

2. Selection of a Charity

Easter Seals - United Cerebral Palsy
American Red Cross
Joy Charter School
Animal Protection Society

3. Experimental Task (fMRI)

- We used a variant of the "Monetary Incentive Delay (MID)" task.
- Subjects (or the computer) responded faster than a threshold to earn money.
- Four conditions were used.

4. Self-Reported Altruism

Subjects completed Rushton’s (1981) Self-report Altruism Scale. We derived an Altruism Score from responses to 10 of the items that maximally differentiated our subjects (according to cluster analysis).

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>1. I have given directions to a stranger.</td>
<td>24-29 (19%)</td>
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<tr>
<td>2. I have made change for a stranger.</td>
<td>29-35 (20%)</td>
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<tr>
<td>3. I have given money to a charity.</td>
<td>19-23 (20%)</td>
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<tr>
<td>4. I have given money to a stranger.</td>
<td>24-29 (19%)</td>
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<td>5. I have donated goods or clothes.</td>
<td>29-35 (20%)</td>
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<tr>
<td>6. I have done volunteer work.</td>
<td>19-23 (20%)</td>
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<tr>
<td>7. I have carried a stranger’s belongings.</td>
<td>24-29 (19%)</td>
</tr>
<tr>
<td>8. I have held the door open for a stranger.</td>
<td>29-35 (20%)</td>
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<tr>
<td>9. I have let someone cut in front of me in line.</td>
<td>19-23 (20%)</td>
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<tr>
<td>10. I have helped an unfamiliar classmate.</td>
<td>24-29 (19%)</td>
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ALTRUISM SCORES

n = 27

fMRI RESULTS

1. Reward-guided behavior evokes striatal and prefrontal activation

2. Fronto-striatal activation is modulated by reward target: personal or social

3. Perception of charitable actions evokes STS, posterior cingulate activation

4. STS activation is correlated with self-reported altruism

CONCLUSIONS

-Actions guided by social rewards evoke activation in regions associated with personal rewards.
-Modulatory effects of social rewards could be explained by motivational factors.
-Perception of reward-guided agency influences activation of regions important for theory of mind.
-Self-reported altruism predicts activation amplitude in the superior temporal sulcus.