The Bystander Effect in a Multi-Player Dictator Game

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The Good Samaritan
by He Qi

Humans are a cooperative species

- Humans are vastly more cooperative than other animals
- Experimental data from behavioral economics reveal that we have pro-social preferences.
- Even in situations with no strategic interests, people promote the welfare of others at a personal cost.
- This type of behavior has been cross-culturally documented (Henrich et al., 2006).

The Bystander Effect

Kitty Genovese (03/13/64)

For more than half an hour thirty-eight respectable, law-abiding citizens in Queens watched a killer stalk and stab a woman in three separate attacks in Kew Gardens. Twice, the sound of their voices and the sudden glow of their bedroom lights interrupted him and frightened him off. Each time he returned, sought her out and stabbed her again. Not one person telephoned the police during the assault; one witness called after the woman was dead. (NY Times)

The Bystander Effect

Latané and Nida, 1981

- A recipient is less likely to receive help, as the number of onlookers increases.
- The presence of others inhibits an individual from engaging in pro-social behavior.
- The effect has been replicated scores of times using many different dependent measures:
  - Fire in another room
  - Someone feigning a seizure
  - A knock heard on the door (non-emergency)
  - A damsel in distress
Explanations
Latané and Nida, 1981

- **Audience inhibition**: The bystander fears negative evaluation by others for intervening, e.g. situation may not be an emergency.

- **Social influence**: The bystander infers from the inaction of others that inaction is the appropriate behavior.

- **Diffusion of responsibility**: The presence of others offloads some of the responsibility onto them. (Not a division of responsibility.)

Our Motivations

- Most Bystander studies assume that
  - the decision to help is dichotomous, and
  - the welfare of the recipient saturates with one dose of help

- Would the Bystander Effect hold when helping behavior is continuous and the recipient’s welfare increases with the amount of help received?

- Behavioral economics offers a rich set of tools to study social preferences, allowing for experimental control and comparison across settings.

Study 1: Laboratory

**Study 1**

- **Dictator Game**: The dictator is given a sum of money and can transfer any amount to a recipient, who starts with nothing.

- **Conditions**: 1 Recipient may receive money from 1, 2, or 3 Dictators. Transfers are simultaneous, one-shot and anonymous.
Study 1

- The endowments varied across conditions, keeping the average welfare per group constant at $12.
- If the Bystander Effect holds, recipients should earn less money as the number of dictators increases.

<table>
<thead>
<tr>
<th>Condition</th>
<th># Dictators</th>
<th># Recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>d1</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>d2</td>
<td>44</td>
<td>22</td>
</tr>
<tr>
<td>d3</td>
<td>66</td>
<td>22</td>
</tr>
</tbody>
</table>

Study 1: Descriptive Statistics

- N = 198 subjects (110 females, 88 males)
- Mean age = 20.3 (SD = 3.1)
- For each condition, we had 22 groups, comprised of 1 recipient and 1, 2, or 3 dictators

Recipient Payoffs
Recipient Payoffs

Mean payoff
\[ d_1 = \$6.68 \]
\[ d_2 = \$4.18 \]
\[ d_3 = \$4.22 \]

Kolmogorov-Smirnov
\[ d_1 \text{ vs } d_2: D=0.45, p=0.02 \]
\[ d_1 \text{ vs } d_3: D=0.41, p=0.05 \]
\[ d_2 \text{ vs } d_3: D=0.23, p=0.62 \]

Effect Size
\[ \Pr(d_1 > d_2) = 0.64 \]
\[ \Pr(d_1 > d_3) = 0.64 \]
\[ \Pr(d_2 > d_3) = 0.52 \]

Data points lie on the horizontal lines

Vertical lines represent jumps to the next highest offer
20% of Recipients earned $0

45% of Recipients earned $4 or less

65% of Recipients earned $9 or less

30% of D1 Recipients earned $9 or more

90% of D2 and D3 Recipients earned $6 or less
Dictator Behavior

Mean fractions "equal" transfers
- $6.68/12 = 0.56$
- $2.09/6 = 0.35$
- $1.41/4 = 0.35$

Kolmogorov-Smirnov
- $d1 \text{ vs } d2: D=0.27, p=0.23$
- $d1 \text{ vs } d3: D=0.39, p=0.01$
- $d2 \text{ vs } d3: D=0.14, p=0.64$

Effect Size
- $Pr(d1>d2) = 0.66$
- $Pr(d1>d3) = 0.66$
- $Pr(d2>d3) = 0.51$

Recipient Expectations

Recipients were paid a $3 bonus if they accurately predicted how much they would receive.

4 out of 66 Recipients earned the bonus.

Mean Expectations
- $d1: $4.86$
- $d2: $4.04$
- $d3: $4.54$

Kolmogorov-Smirnov
- $d1 \text{ vs } d2: D=0.23, p=0.62$
- $d1 \text{ vs } d3: D=0.18, p=0.86$
- $d2 \text{ vs } d3: D=0.23, p=0.62$
Recipient Expectations and Payoffs

Recipients, to a small degree, anticipated the results.

Kolmogorov-Smirnov
- d1: D=0.18, p=0.86
- d2: D=0.41, p=0.05
- d2: D=0.18, p=0.86

Sex Indifference

Recipient Expectations and Payoffs

Sex Indifference

Recipient Expectations and Payoffs

Recipient Expectations and Payoffs

Recipient Expectations and Payoffs
Study 1: Summary

- The Bystander Effect holds when helping behavior is continuous and the recipient’s welfare increases with the amount of help received.
- Recipients go home with substantially less money when there are 2 or 3 dictators as opposed to when there is 1.
- Recipients, to a small a degree, anticipate the Bystander Effect.

Questions

- Is our diffusion of responsibility driven by confusion? Can subjects do the math?
- In the standard Dictator Game, people have a preference for equal outcomes.
- In Study 1, this preference diminishes as the number of Dictators increases.
- Is there any preference for “equal” offers as the number of helpers increase?

Study 2

- Replication of Study 1 with an online subject population.
- Conditions: Subjects were assigned the role of Dictator. They were either alone, with one other Dictator, or two other Dictators. (There were no Recipients.)
- No compensation, hypothetical offers.
Study 2: Descriptive Statistics

- N = 215 subjects (157 females, 58 males)
- Well-represented age distribution from 18–64
- For each condition, there were only Dictators, no Recipients

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<tbody>
<tr>
<td>d1</td>
<td>40</td>
</tr>
<tr>
<td>d2</td>
<td>79</td>
</tr>
<tr>
<td>d3</td>
<td>96</td>
</tr>
</tbody>
</table>

Dictator Behavior

Truncated at 2

Mean fractions “equal” transfers
- d1: $9.08/12 = 0.76$
- d2: $6.59/6 = 1.10$
- d3: $4.34/4 = 1.09$

Kolmogorov-Smirnov
d1 vs d2: D=0.27, p=0.006
d1 vs d3: D=0.39, p=0.06
d2 vs d3: D=0.14, p=0.20

Effect Size
- Pr(d1>d2) = 0.35
- Pr(d1>d3) = 0.36
- Pr(d2>d3) = 0.52

A hypothetical infusion of responsibility?
Cumulative Density

Fraction of Equal Transfer Amount

Cumulative Density

Fraction of Equal Transfer Amount

Cumulative Density

Cumulative Density

Fraction of Equal Transfer Amount

Cumulative Density

Fraction of Equal Transfer Amount

Cumulative Density

Fraction of Equal Transfer Amount

Cumulative Density

More “hyper-equal” offers in the D2 and D3

“Equal” offers were by far the most common

More $0 offers in D1 compared to D2 or D3

Miserly Youth

No interactions between other effects and age, though

Sex Difference

Mean fractions “equal” offers
Females = 1.09
Males = 0.87

Kolmogorov-Smirnov
D=0.29, p=0.016

Effect Size
Pr(Female>Male) = 0.59

This pattern holds across conditions

Men make many more $0 offers
Study 2: Summary

- No Bystander Effect in an online study with hypothetical stakes.
- An infusion of responsibility: Recipients in the 2 or 3 Dictator condition would have earned 50% more money compared to the 1 Dictator condition.
- Females were much less likely than males to offer nothing in all three conditions.

Conclusion

- We found a diffusion of responsibility in a laboratory study with real stakes – Recipients earned 1/3 less with multiple dictators, even though the average welfare was held constant.
- In an online replication, we found an infusion of responsibility – Recipients earned 1.5 times as much with multiple dictators.
- In the online study, the modal offer, across conditions, was the “equal” offer, showing that subjects can do the math and have some preference for the “equal” offer.

Follow up studies

- Does our result hold with dichotomous offers – $0 or the “equal” offer?
- Dictators “negotiate” a mutually acceptable transfer to a recipient.
- A “strategy method” in which a dictator makes an offer for all possible offers from the other dictator.

Acknowledgments

- Walter Yuan
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- Gary Charness
Transfer Motivations

- **diffusion** = "I figured that the other Allocator(s) would give money too, so I didn’t need to give more than I did."
- **reputation** = "I didn’t want the other participants in the experiment to think badly of me."
- **unneeded** = "I don’t really need the money, but the Recipient might."
- **fairness** = "I wanted the Recipient to go home with about the same as me."
- **misanthropic** = "I didn’t think the other Allocator(s) would transfer much, if anything."
- **mine** = "The role assignments were determined randomly, so I didn’t have to share my money."
- **unsure** = "It just seemed like the right thing to do, but I’m not exactly sure why."
- **other** = "My motivation for transferring the amount that I did is not listed."

Study 1 Extra Material

Transfer Motivation

![Box plots showing distribution of transfer motivations](image1)

![Box plots showing distribution of dictator transfer motivations](image2)
Study 2 Extra Material

Study 2: Age Distribution
Transfer Motivation

Fraction of Equal Transfer Amount

0 1 2 3 4

diffusion  fairness  mine  misanthropic  other  unneeded  unsure

Dictator Transfer Amount

Belief About Each Other Dictator Transfer Amount

2 Dictators  3 Dictators

0 5 10 15 20

Dictator Wishes Recipient Receives

0 10 20 30 40 50

Dictator Transfer Amount + Belief About Other Dictator(s) Transfer

0 10 20 30 40 50

2 Dictators  3 Dictators