Persuading Teammates to Give: Systematic versus Heuristic Cues for Soliciting Loans

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Elaine Chang
CS 224C
Critical Reception for *Persuading Teammates to Give*

“I was shocked”

– Joel A. Johnson

“A fascinating and wildly innovative study”

– Allex Desronvil

“Able to restrain itself to text but still do so much”

– Muhammad Khattak

WORST PAPER… totally kidding

- Mike Hardy
How do messages persuade people to lend in teams of a philanthropic site?
An Example

Funded
Total loan: $1,200
Powered by 45 lenders

Victoria Isabel
El Alto, Bolivia / Food Stall

Find a new loan

A loan helped to purchase snacks at wholesale and to start a second economic activity with the profits.

Kiva Link
Victoria Isabel's story

Victoria is a 46-year-old woman. She is married and the mother of two children. Her business is selling snack foods.

Victoria is enterprising, responsible, independent, supportive, and very hardworking. She runs her business in the “16 de Julio” area, where according to the Instituto Nacional de Estadística [National Statistics Institute], 72.9% of the urban population lives in poverty. That represents the existence of 58,822 families without adequate access to services and basic supplies, education, healthcare, and/or shelter. Of those, 12% are indigent. The poverty of the population is manifested through insufficient income, risks of infant malnutrition, low academic performance, early withdrawal from school, untreated illnesses, child labor, etc.

Victoria is dark-complexioned and of medium stature. She has long, black, braided hair and dresses in the traditional way. Her native language is Aymara and she learned Spanish after arriving in the city for its commerce. Her business is the sale of snacks and soft drinks from a stand on the street, enduring the cold temperatures that characterize her city.

Victoria would like to expand her business by making a purchase of merchandise for a second business, and to increase her working capital in order to generate greater income and improve her quality of life. This is the reason that she is requesting a loan for the purchase of snacks at wholesale. With the profits, she will start a second economic activity.

Loan details

Field Partner: Emprender

Time on Kiva: 179 months
Kiva borrowers: 17,865
Total loans: $10,420,375
Average cost to borrower: 32% PY
Profitability (return on assets): 0.0%
Average loan size (% of per capita income): N/A
Delinquency rate: 0.00%
Loans at risk rate: 0.00%
Default rate: 0.71%
Currency exchange loss rate: 0.00%

More about Emprender
What is a Field Partner?
An Example

https://www.kiva.org/lend-classic/760221
An Example

Jennifer  Sep 27, 2014 - 6:45 pm PDT

Victoria Isabel has only FOUR DAYS LEFT!

She's wearing a really nice hat, and standing next to an awesome wall painting.

I'm not sure why her loan is having such trouble--she's a food seller in Bolivia, 46-year-old mother of two, and the loan term is only 15 months. It's exactly the kind of thing that normally fills up quickly.

Can anyone help? www.kiva.org/lend/760221
An Example

Hannah  Sep 20, 2014 - 9:21 pm PDT  #357682

@Victoria re: #357538

Send a Kiva Card

Joined Jul 1, 2013

I jumped onto that one! She definitely looks great in that hat. :)

Irene  Sep 18, 2014 - 6:56 am PDT  #356968

@Victoria re: #356747

Send a Kiva Card

Joined Mar 23, 2014

Wonderful! I lent to Matluba's Cheshire Cow!

www.kiva.org/lend/761265

Matluba
Animal Sales
Tajikistan
Funded
An Example

@Victoria re: #356747

What a great find! I am still giggling. Thanks for sharing.

www.kiva.org/lend/756670

Armonia Group
Sewing
Bolivia
Funded

Kristina  Sep 17, 2014 - 6:34 pm PDT  #356845

The cow is OUTSTANDING! LOL

@Victoria re: #356747
Systematic

- Effortful, deep thinking
- Occurs when we evaluate:
  - Quality of the evidence
  - Coherence of the argument
- “Thinking slow”

Heuristic

- Instead of thinking deeply, use simple, inferential rules to decide
- “Thinking Fast”
Operationalizing Heuristic Processing

Theories of social influence

(Cialdini, Robert B., 1987)

- Authority
- Liking
- Social Identity
- Emotion  “if it makes me feel good, it must be right”
- Reciprocity  “it is advocated by someone who did me a favor”
- Scarcity  “if there are only a few left, it must be valuable”
- Social Proof  “many people are doing it”
Paper Structure

Building Features (17)
- Systematic Cues (2)
  - NLP models for loan and borrower worthiness
- Heuristic Cues (7)
  - Models for social proof, emotional language, etc.
- Type of team (1)
  - Common identity, common interest, personal relation
- Control (7)
  - Loan amount, borrower demographics, loan description worthiness

Reducing Features (11)
- Combining features when they are conceptually linked + high internal consistency

Prediction Models (5)
- Five tiered regression models to predict whether or not a team member loaned after being exposed to a message about it.
Systematic Features

1. 1000 Mechanical Turk Annotations
   ○ Loan and Borrower Worthiness
   ○ 1-3 Scale, 1=didn’t mention, 3 = explicit justification for worthiness

2. NLP Models: Embeddings, Linguistic Style, POS, (Request Length)

<table>
<thead>
<tr>
<th></th>
<th>Loan</th>
<th>Borrower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bag of Words</td>
<td>0.493</td>
<td>0.398</td>
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<tr>
<td>LIWC</td>
<td>0.436</td>
<td>0.425</td>
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<tr>
<td>Word Embedding</td>
<td>0.620</td>
<td>0.322</td>
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<tr>
<td>Part Of Speech</td>
<td>0.455</td>
<td>0.416</td>
</tr>
<tr>
<td>ALL</td>
<td>0.661</td>
<td>0.295</td>
</tr>
</tbody>
</table>

Table 1. Regression model performances for predicting the worthiness of the loan and the borrower.
Defining the Worthiness of the Loan

**Level 1** does not mention any reasons for the loan

- This loan is set to expire in 1 day.

**Level 2** mentions the reason, without additional justification

- Collecting scrap metal to sell to recyclers. Expiring later today.

**Level 3** mentions the reason, with substantial justification

- This loan is to finance school tuition for students whose families have low incomes ...

e.g.,
Systematic Processing Features

1. 1000 Mechanical Turk Annotations
   ○ Loan and Borrower Worthiness
   ○ 1-3 Scale, 1=didn’t mention, 3 = explicit justification for worthiness

2. NLP Models: Embeddings, Linguistic Style, POS, (Request Length)

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<thead>
<tr>
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<th>Loan</th>
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<th>Borrower</th>
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</thead>
<tbody>
<tr>
<td><strong>Bag of Words</strong></td>
<td>0.493</td>
<td>0.398</td>
<td>0.395</td>
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<td><strong>0.242</strong></td>
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Table 1. Regression model performances for predicting the worthiness of the loan and the borrower.
### Heuristic Processing Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
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<tr>
<td># team members loaned</td>
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<td>153</td>
<td>3.23</td>
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<tr>
<td>(explicit) mention loaned</td>
<td>0</td>
<td>1</td>
<td>0.18</td>
<td>0</td>
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<tr>
<td>actual loaned or not</td>
<td>0</td>
<td>1</td>
<td>0.40</td>
<td>0</td>
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<tr>
<td>(explicit) mention scarcity</td>
<td>0</td>
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<td>0.46</td>
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<td>actual remain hours</td>
<td>0</td>
<td>1</td>
<td>0.43</td>
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<td>messages of advocate</td>
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<td>9810</td>
<td>563.85</td>
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<td>negative emotion</td>
<td>0</td>
<td>1</td>
<td>0.01</td>
<td>0</td>
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<tr>
<td>(explicit) mention we words</td>
<td>0</td>
<td>0.667</td>
<td>0.01</td>
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<td>team importance</td>
<td>0</td>
<td>1</td>
<td>0.38</td>
<td>0</td>
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</table>
Type of Team

...the first author manually assigned each team into one of the above types, based on team name, description and “loan because” statement...

Location:
NerdFighters
Location:
NerdFighters
Team website
We loan because...
We aim to decrease world suck.
About us
We’re NerdFighters! We fight against suck; we fight for awesome! We fight using our brains, our hearts, our calculators, and our trombones.
Happy lending!
Short on time or need help finding a loan?
On the 17th of the month, a Deserving Dozen of team loans are featured on the NerdFighters Message Board.
There is also a NerdFighters Tienda, where a selection of loans are stocked on the shelves of this one-stop shop of team loans: starfish.dynalias.org/starred/nerdfighters
Check it out!
Follow us on Twitter: twitter.com/KivaNerds
## Ultimately: 11 Features

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<tbody>
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<td>Control Variables</td>
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<td>1.456***</td>
<td>1.494***</td>
<td>1.493***</td>
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<td>0.999</td>
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<td>1.021***</td>
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<td>borrower gender</td>
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<td>0.970**</td>
<td>0.964**</td>
<td>0.964**</td>
<td>0.972</td>
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<tr>
<td>borrower smile</td>
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<td>1.032*</td>
<td>1.019</td>
<td>1.019</td>
<td>1.038*</td>
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<td>0.976**</td>
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<td>0.990</td>
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<td>Identity</td>
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<td>0.967***</td>
<td>0.964***</td>
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<tr>
<td>actual remain hours</td>
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<td>0.941***</td>
<td>0.958***</td>
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<td>0.975***</td>
<td>0.982*</td>
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<tr>
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<td>1.046***</td>
<td>1.031**</td>
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<tr>
<td>#team members loaned</td>
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<td>0.943***</td>
<td>0.912***</td>
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<td>Social Proof</td>
<td></td>
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<td>mention negative emotion</td>
<td>1.006</td>
<td>1.006</td>
<td>1.001</td>
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<td>Emotional</td>
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<td>team importance x rb team</td>
<td></td>
<td></td>
<td></td>
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<td>1.047</td>
</tr>
</tbody>
</table>
Q&A with Professor Yang on Methodology
(Some) Results

- One standard deviation increase in the worthiness of the loan as described in the advocate’s persuasive message was associated with 5% lower odds of potential lenders contributing to the loan (OR=0.953).

- A standard deviation increase in the advocates’ authority was associated with 20% lower odds of other members’ compliance with their requests.

- Lenders were substantially more likely to give in response to loan requests when the lender more strongly identified with the team. A standard deviation increase in (team importance) was associated with 60% higher odds of giving.

- Both the actual urgency of the loan (i.e., the time remaining until the request expired) and advocates explicitly mention the urgency of loans in their requests was associated with lower odds of persuading team members (OR=0.940 and 0.964 respectively).

- The worthiness of requests was not significantly predictive of persuading receivers to make loans.
What are possible explanations for:

● Inverse relationship between loan worthiness and success?
● That heuristic features were much more predictive of success?
Axel Peytavin:
a bit sad too when you think about it, at least for introverts that spend a lot of time preparing an announce to have, in the end, money being loaned to those who just end up being likable. But in some sense, it checks out with our experience of real life I suppose :)

Chloe Liu:
Another paper [which suggests] “changing context” is more effective than “changing mind” in altering human behavior… Heuristic factors might be superficial but they are also salient enough to catch people’s attention…

Xiaoyuan Ni:
the features collected for the systematic and heuristic processing are imbalanced.

Helen Minsi Gui
I wonder if this surprising relationship might be picking up on some unobserved factor: maybe loans with “worthier” descriptions are those where advocates felt that the likelihood of success on the basis of other factors was lower, resulting in the need to write characterize the loan as more “worthy” to improve perceived chances of success.
To what extent are these results generalizable? In what ways are the findings specific to Kiva, or platforms like Kiva?

For example, applicability to:

- Political campaigns targeting small-dollar donors with “Last Chance to Give” alerts (Allex Desronvil)
- GoFundMe, where investment is just a taxable gift (Joel A Johnson)
- Banking (Muhammad Khattak)
- Persuasion in online Q&A platforms (Chloe Liu)
- Fintech companies using AI for loan worthiness (Kay Ren)
- Crowdsourced venture capital (Joel A Johnson)
What are ways we could improve or extend this study?
Feature sets can be improved, especially with current progress in the area of natural language processing.

Sophia Angelica Ramsey
I would have included positive emotions as well as negative emotions in the “emotional” category.

Adhitya Venkatraman
.. deepen the way that worthiness is defined. The authors use a three-tiered system for evaluating loan and borrower worthiness. This system is mostly based on categories of information provided, but does not investigate the information itself...

Hannah Rachel Levin
other data points such as if a lender likes an advocate such as common friends in their social network, physical attractiveness, and overall similarity between the individuals. However, there are ethical considerations of an algorithm measuring physical attractiveness.

Azure Siyi Zhou
Although facial recognition technologies have improved, we know that software like Face++ are less accurate for marginalized groups... more work is needed to understand how the identities of lenders and borrowers affect lending.

I would have included positive emotions as well as negative emotions in the “emotional” category.