When Self-Humanization Leads to Algorithm Aversion – What Users Want from Decision Support Systems on Prosocial Microlending Platforms

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Appendix (available online via http://link.springer.com)

Appendix A: Material

Introduction questionnaire

What is microlending?

When people or businesses need money, they go to the bank and ask for a loan (credit). Microlending is different from normal lending: First, the loan amounts are much smaller (hence “micro"). Second, the entrepreneur(s) typically neither have a well-paying job, nor a good credit history or expensive objects they can use as a guarantee. As in traditional lending, also in microlending there is a risk that the entrepreneurs do not pay back their loan, and thus lenders could lose the money that they have lent.

What is peer-to-peer microlending?

New internet platforms were created on which individual people instead of banks can give microloans to others. Often, these platforms allow the loans to get split up into smaller amounts, so that multiple lenders can contribute a small part to the full loan one entrepreneur will receive.

[***Text only for the prosocial experimental condition******]**

What is prosocial peer-to-peer microlending?

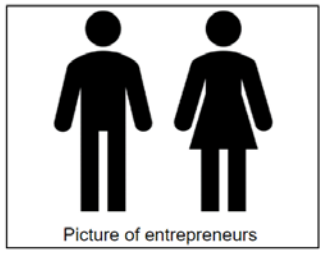
Prosocial means that people who lend money to others are motivated to help them. Consequently, they do not charge interest rates from the entrepreneur(s), and thus do not make a profit from their loan. Rather they take a risk of losing their money if the entrepreneurs are not paying back their loan.

[***Text only for the for-profit experimental condition******]**

What is for-profit peer-to-peer microlending?

For-profit means that people who lend money to others are motivated to gain money through an interest rate. The interest rate normally consists of two parts. The first part is a risk premium, that rises with the risk that an entrepreneur could not pay back the loan - compensating the lender for the risk of losing their money in this case. The second part is a profit for the lender.

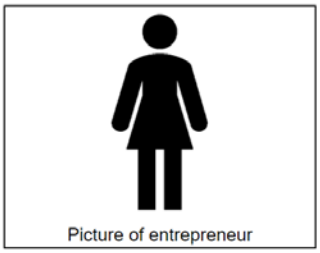
Here are three examples how requests from a for-profit microlending platform could look like:



Picture of entrepreneurs

Chris and Nicole recently started a small business in Senegal to design and create acrylic jewelry and accessories. Initially, they used their savings to buy necessary materials. But now, they need their first funding to keep on producing more jewelry. Increasing their assortment would allow them to sell not just in their small shop, but also to travel to several markets in the region, aiming to keep their business alive and make it sustainable.

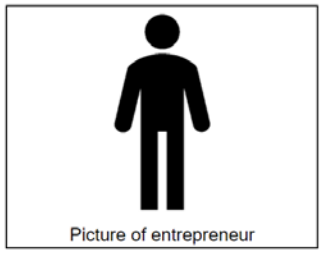
Loan Amount[1]	5,000$
Risk Rating[2]	4.5/5
Repaid on time[3]	Yes
Interest rate[4]	5%



Picture of entrepreneur

Ann is the owner and operator of a small embroidery business in Guatemala, focusing on dresses. Founded four years ago, the business is helping the 30-year-old woman and mother of two children to contribute to her family income. To grow her business and to avoid losing time due to delays in material delivery, she wants to buy thread, fancy cloth, sequins, and pearls of various colors in advance, to have them in stock. The loan would enable her to buy the desired items, as she does not have sufficient cash on hand.

Loan Amount[1]	5,000$
Risk Rating[2]	5/5
Repaid on time[3]	Yes
Interest rate[4]	6%



Picture of entrepreneur

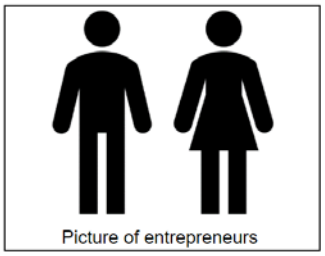
Bob recently started his education as an architect in Bolivia. To support himself during his studies, he works as a tour guide during the weekends. Due the pandemic and the ensuing decline in tourism, he lost his job and cannot afford the monthly payments for his education and flat. To keep his head above water during this challenging period of his life, he asks for an education loan that he aims to pay back after his studies, once he has found a job as an architect.

Loan Amount[1]	5,000$
Risk Rating[2]	3.5/5
Repaid on time[3]	Yes
Interest rate[4]	4%

1. Loan Amount: Describes the amount of the loan that was requested.
2. Risk rating: This key figure is calculated by the peer-to-peer platform and describes how likely the entrepreneur will pay back the loan. A higher value stands for a lower probability of default.
3. Repaid on time: This describes if an entrepreneur has already borrowed a loan on the platform and whether or not they were able to pay it back. If the entrepreneur has never borrowed money before, this information is not available.
4. Interest rate: The interest rate is determined on the base of multiple information by the peer-to-peer platform. A higher risk leads to an increasing interest rate.

Figure 1: Examples out of the introduction (prosocial experimental condition)

Here are three examples how requests from a prosocial microlending platform could look like:



Picture of entrepreneurs

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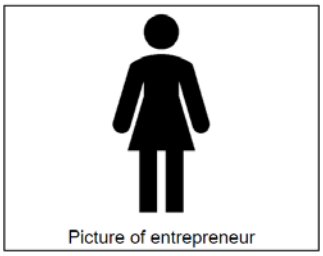
Loan Amount[1]	5,000$
Risk Rating[2]	4.5/5
Repaid on time[3]	Yes



Picture of entrepreneur

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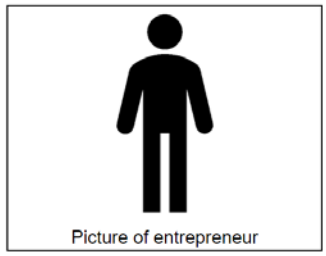
Loan Amount[1]	5,000$
Risk Rating[2]	5/5
Repaid on time[3]	Yes



Picture of entrepreneur

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1. Loan Amount: Describes the amout of the loan the entrepreneur requested.
2. Risk rating: This key figure is calculated by the peer-to-peer platform and describes how likely the entrepreneur will pay back the loan. A higher value stands for a lower probability of default.
3. Repaid on time: This describes if an entrepreneur has already borrowed a loan on the platform and whether or not they were able to pay it back. If the entrepreneur has never borrowed money before, this information is not available.

Figure 2: Examples out of the introduction (for-profit experimental condition)

Questions

Manipulation check

When making a microlending decision, I want to feel like I am...

- ... emotional, like I am responsive and warm.
- ... robotic, like I am mechanical and focusing on the hard facts.
- ... superficial, like I have no deep thoughts about entrepreneur(s).
- ... open-minded, like I am receptive for arguments and ideas.
- ... close to the entrepreneur(s).

Importance of autonomy (Adapted from Deci and Ryan 2000; Gagné 2003), Cronbach's α = 0.67 (7-point Likert scale from (1) not important at all (7) extremely important)

If you had to make a decision now for an entrepreneur or a group of entrepreneurs, to what extent would it be important to you ...

- ...to make it without being influenced by others (friends, experts, family, etc.).
- ...to make it without being influenced by features of the website (recommendation systems, chatbots, etc.)
- ...to freely choose from a set of possible options.
- ...to choose an entrepreneur who fits my ideas and opinions.
- ...to choose an entrepreneur who reflects my personal tastes or values.
- ...to be in control of the decision-making process.

Importance of empathy (Adapted from Davis 1980, 1983), Cronbach's α = 0.88 (7-point Likert scale from (1) not important at all (7) extremely important)

If you had to make a decision now, to what extent would it be important to you to decide...

- ...to choose an entrepreneur/entrepreneurs for whom I feel sympathy.
- ...to imagine the situation of the entrepreneur/entrepreneurs.
- ...to feel sorry for the entrepreneur/entrepreneurs.
- ...to feel close to the entrepreneur/entrepreneurs.
- ...to feel concern for the entrepreneur/entrepreneurs.

Algorithm aversion (Adapted from Longoni et al. 2019) (7-point Likert scale from (1) Definitely human supporter (7) Definitely computerized decision support)

On the platform, you can choose between two decision support options: a human who supports you or a computerized decision support system which supports you. Both will first ask you for your preferences and then support you in your decision.

If you had to make a decision now, which support option would you choose to help you with your decision?

Algorithm aversion based on the three evaluation criteria by Jussupow et al. (2020) and the scale by Jago (2019), Cronbach's α = 0.88 (7-point Likert scale from (1) not at all (7) very much so)

Indicate your preference on the provided scale from "not at all" to "very much so".

- To what extent do you trust a human to support you in your decision?
- To what extent do you trust a computer to support you in your decision?
- How appropriate would you find getting help from a human for making this microlending decision?
- How appropriate would you find getting help from a computer for making this microlending decision?
- To what extent do you expect the decision support of a human to be authentic?
- To what extent do you expect the decision support of a computer to be authentic?

Human-like decision support (**Adapted from Ruttan and Lucas 2018), Cronbach's α = 0.87** (7-point Likert scale from (1) not at all (7) very much so)

Imagine that you selected the computerized decision support system. Now you can finetune some of the decision support system's characteristics.

The support system should...

- ... show warmth towards the entrepreneur(s).
- ... be open-minded, i.e. being receptive to ideas and arguments beyond the hard facts about the entrepreneur(s).
- ... be emotional, i.e. it is responsive and warm towards the entrepreneur(s).
- ... be superficial, i.e. having no deep thoughts about the entrepreneur(s).
- ... behave like a computer and not like a human.
- ... be a cold mechanical robot, mathematically optimizing the selection of the entrepreneur(s).

Control Variables:

Causes: Domain experience, experience with computerized decision support, incentivization through social norms

- How frequently have you used such a microlending platform before?
- How frequently were your decisions in this domain supported by a computerized support in the past?

- How many people do you know who are using computerized decision support systems on microlending platforms?

Capability of algorithm/computer (from Bigman and Gray 2018)

To what extend do you think a computer ...

Agency Cronbach's α = 0.91

- ... can communicate with others.
- ... is able of thinking.
- ... can plan its actions.
- ... is intelligent.
- ... has foresight.
- ... is able to think things through.

Experience Cronbach's α = 0.98

- ... is sensitive to pain.
- ... can experience happiness.
- ... can experience fear.
- ... can experience compassion.
- ... can experience empathy.
- ... can experience guilt.

Appendix B: Statistical analyses

Table 1: Convergent and discriminant validity

Latent Construct	Cronbach's α	CR	AVE	1	2	3	4	5
1. Human-like decision support	0.8694	0.9013	0.6093	**0.7806**[a]				
2. Importance of autonomy	0.6447	0.7905	0.4855	0.2025***	**0.6968** [a]			
3. Importance of empathy	0.8815	0.9885	0.6049	0.4729***	0.4450***	**0.7778** [a]		
4. Perceived agency capability	0.9108	0.9305	0.6925	0.0968**	0.1724***	0.3293***	**0.8322** [a]	
5. Perceived experience capability	0.9800	0.9838	0.9103	0.0899**	0.2229***	0.4223***	0.4932***	**0.9541** [a]

a The square root of the AVE is shown in the diagonal. The lower triangle shows the correlations between the constructs.
*p < 0.1, ** p < 0.05, *** p < 0.01

Table 2: Robustness check without control variables

Hypotheses and path	*β*	*SE*	*P/CI*	*Supported?*
H1 (a_1)	0.86	0.11	<0.001	yes
H2 (b_1)	0.03	0.07	0.680	no
H3 (a_2)	0.33	0.08	<0.001	yes
H4 (b_3)	0.26	0.09	0.005	yes
Indirect effect ($a_1 - b_1$)	0.03	0.07	[-0.11; 0.16]	-
Indirect effect ($a_2 - b_3$)	0.09	0.04	[0.03; 0.18]	-
H5 (c_1)	0.22	0.03	<0.001	yes
H6 (d_1)	0.68	0.13	<0.001	yes

Notes: The experimental condition was dummy-coded, with 0 = for-profit and 1 = prosocial. For indirect effects, we used bootstrapped bias-corrected confidence intervals (with 5,000 resamples), following the recommendation of Preacher and Hayes (2004, 2008).

Table 3: Dependent variable: algorithm aversion; with reported betas

DV: Algorithm aversion	Without controls	With controls
Importance of autonomy	0.26***	0.33***
Importance of empathy	0.03	0.28***
Algorithm control variables		
Domain knowledge		0.06
Experience		-0.19**
Incentivization		-0.05
Perceived agency capability		-0.25***
Perceived experience capability		-0.25*

General control variables	
Gender	
Female	Base
Male	-0.40**
Other	0.18
Do not want to specify	2.07**
Age	-0.01

Notes: * p < 0.1, ** p < 0.05, *** p < 0.01
Partial output of the complete SUREG Model.