

How does default impact attention and choice for lower- and higher-income individuals?

Chaoyi (Lyra) Shi

Behavioral Sustainability Lab

*Some information is removed or modified due to confidentiality

Choice architecture is inevitable



Nudge

Nudge is an option; law is a mandate, a shove

Examples:

Default

Simplification

Disclosure

Convenience

Goal: provide an **attentional** account for financial decision making of lower- and higher-income individuals, in addition to financial literacy and numeracy accounts

Exclusion criteria:

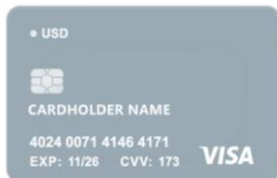
Bubbleview task

- a. >20 seconds per fixation
- b. ≤ 20 fixations

Qualtrics survey

- a. attention checks
- b. < 100 s OR > 2000 s on the qualtrics survey
- c. $\leq \$100$ OR $\geq \$20,000$ (in USD) per month

Infinite



Earn 1.5% in cash back dollars on grocery purchases, dining at restaurants and travel purchases

Earn 1.5% in cash back dollars on gas purchases and all other purchases

Annual fee \$0

Purchase interest rate 14.99%

Default interest rate 20.74%

Signature



Earn 3% in cash back dollars on grocery purchases, dining at restaurants and travel purchases

Earn 1.5% in cash back dollars on gas purchases and all other purchases

Annual fee \$95

Purchase interest rate 25.24%

Default interest rate 29.99%

Conditions:

- a. **Good default** condition: infinite card pre-selected ($N=124$)
- b. **Bad default** condition: signature card pre-selected ($N=125$)
- c. **Control** condition: no card pre-selected ($N=125$)

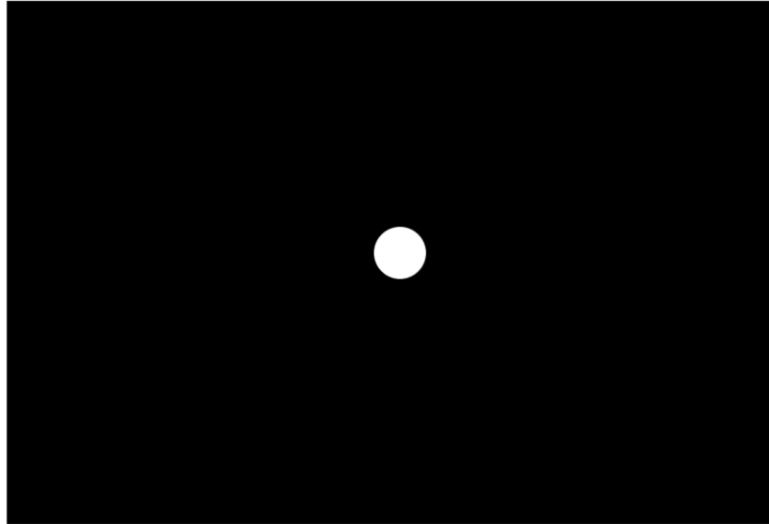
Task: choose the better credit card for themselves out of two options

Measures: attention, choice, memory

Imagine you are applying for a credit card at a local bank. Here are two card options.
Which card is better for you given your financial situation?

The two cards are covered by a black mask. You can move our mouse to see the cards
and their information below. Please view the cards carefully and make a decision on
which card is better for you.

You can select the card by clicking on the button below.



After you have made your choice, click on Next to proceed.

Next

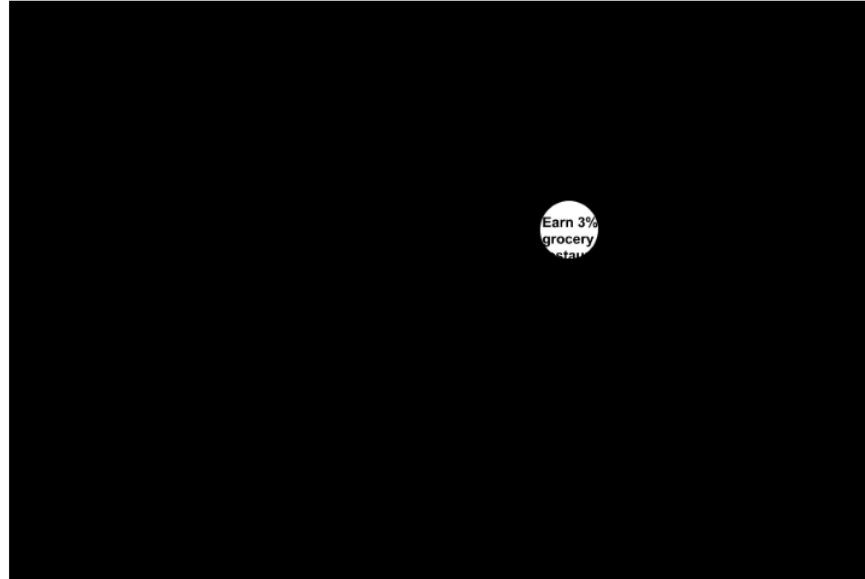
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Which card is better for you given your financial situation?

The two cards are covered by a black mask. You can move our mouse to see the cards
and their information below. Please view the cards carefully and make a decision on
which card is better for you.

Control Condition:

No card pre-selected

You can select the card by clicking on the button below.



After you have made your choice, click on Next to proceed.

Next

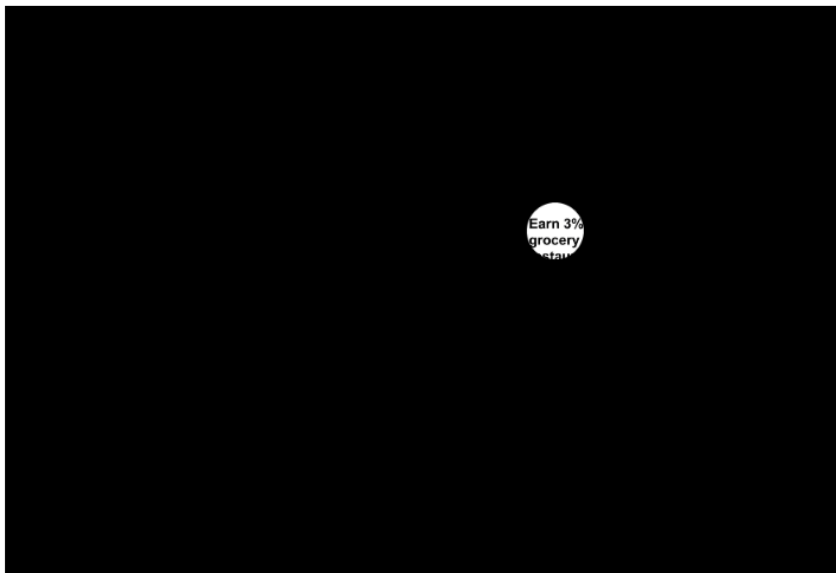
Imagine you are applying for a credit card at a local bank. Here are two card options. Which card is better for you given your financial situation? **(A credit card has been pre-selected for you. You will get this option unless you switch to the other option.)**

The two cards are covered by a black mask. You can move our mouse to see the cards and their information below. Please view the cards carefully and make a decision on which card is better for you.

Good default condition:

Infinite card pre-selected

You can select the card by clicking on the button below.



After you have made your choice, click on Next to proceed.

Next

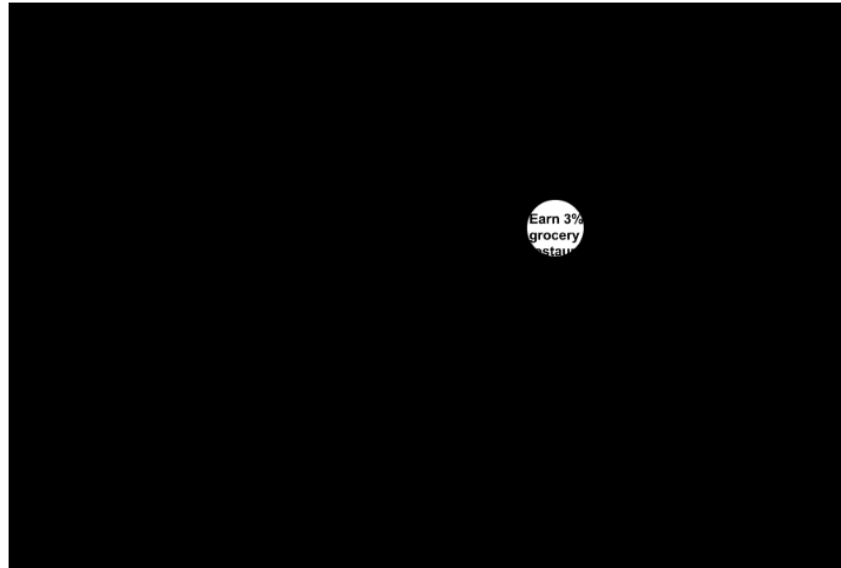
Imagine you are applying for a credit card at a local bank. Here are two card options. Which card is better for you given your financial situation? **(A credit card has been pre-selected for you. You will get this option unless you switch to the other option.)**

The two cards are covered by a black mask. You can move our mouse to see the cards and their information below. Please view the cards carefully and make a decision on which card is better for you.

Bad default condition:

Signature card pre-selected

You can select the card by clicking on the button below.



After you have made your choice, click on Next to proceed.

Next

Surprise memory test

Here are some questions for you about the cards you just saw.

Which credit card provides FEWER cash back dollars on grocery purchases, dining at restaurants and travel purchases?

- Infinite
- Signature
- The two cards are the same

Which credit card provides FEWER cash back dollars on gas purchases and all other purchases?

- Infinite
- Signature
- The two cards are the same

Which card has a HIGHER annual fee?

- Infinite
- Signature
- The two cards are the same

Which card provides a HIGHER purchase interest rate?

- Infinite
- Signature
- The two cards are the same

Which card provides a LOWER default interest rate?

- Infinite
- Signature
- The two cards are the same

Financial literacy questions

Here are some questions on financial literacy. Please provide your best guess on these questions.

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy:

- More than today with the money in this account
- Exactly the same as today with the money in this account
- Less than today with the money in this account
- Don't know
- Refuse to answer

Do you think that the following statement is true or false? "Bonds are normally riskier than stocks."

- True
- False
- Don't know
- Refuse to answer

Considering a long time period (for example, 10 or 20 years), which asset described below normally gives the highest return?

- Savings accounts
- Stocks
- Bonds
- Don't know
- Refuse to answer

Normally, which asset described below displays the highest fluctuations over time?

- Savings accounts
- Stocks
- Bonds
- Don't know
- Refuse to answer

When an investor spreads his money among different assets, does the risk of losing a lot of money:

- Increase
- Decrease

Numeracy questions

Here are some questions on numeracy. Please provide your best guess on these questions.

Imagine that we flip a fair coin 1,000 times. What is your best guess about how many times the coin would come up heads in 1,000 flips?

In the BIG BUCKS LOTTERY, the chance of winning a \$10 prize is 1%. What is your best guess about how many people would win a \$10 prize if 1000 people each buy a single ticket to BIG BUCKS?

In ACME PUBLISHING SWEEPSTAKES, the chance of winning a car is 1 in 1,000. What percent of tickets to ACME PUBLISHING SWEEPSTAKES win a car? ____%

Which of the following numbers represents the biggest risk of getting a disease?

- 1 in 100
- 1 in 1000
- 1 in 10

It is important to read the questions. This is an attention check that we use to make sure that participants are paying attention to the questions we ask. Please select 5% for this question.

- 1%
- 5%
- 10%

Income

Lower-income group:
below the median income
(household
income/sqrt(household n))

Higher-income group:
above the median income
(household
income/sqrt(household n))

What is your total annual household income before tax (in USD)?

- Less than \$10,000
- \$10,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- \$50,000 - \$59,999
- \$60,000 - \$69,999
- \$70,000 - \$79,999
- \$80,000 - \$89,999
- \$90,000 - \$99,999
- \$100,000 - \$109,999
- \$110,000 - \$119,999
- \$120,000 - \$129,999
- \$130,000 - \$139,999
- \$140,000 - \$149,999
- More than \$150,000

How many people are there in your household (including yourself)?

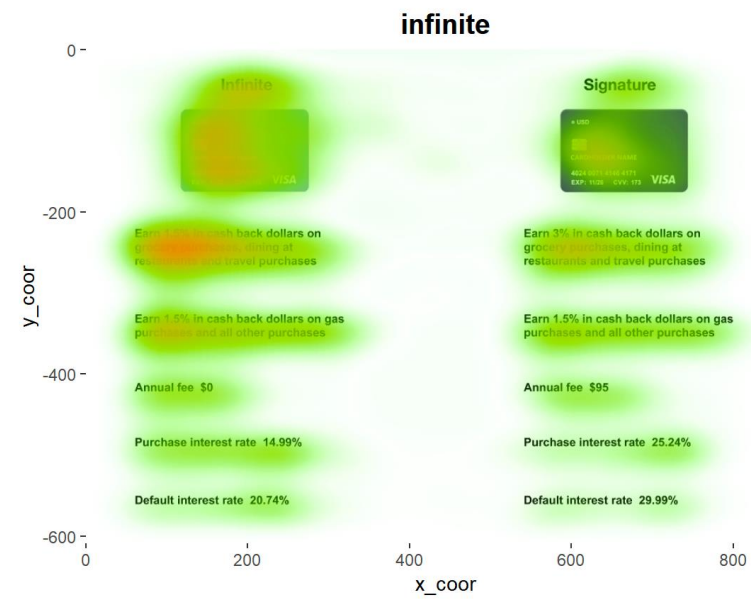
Results of the pilot study

Attention

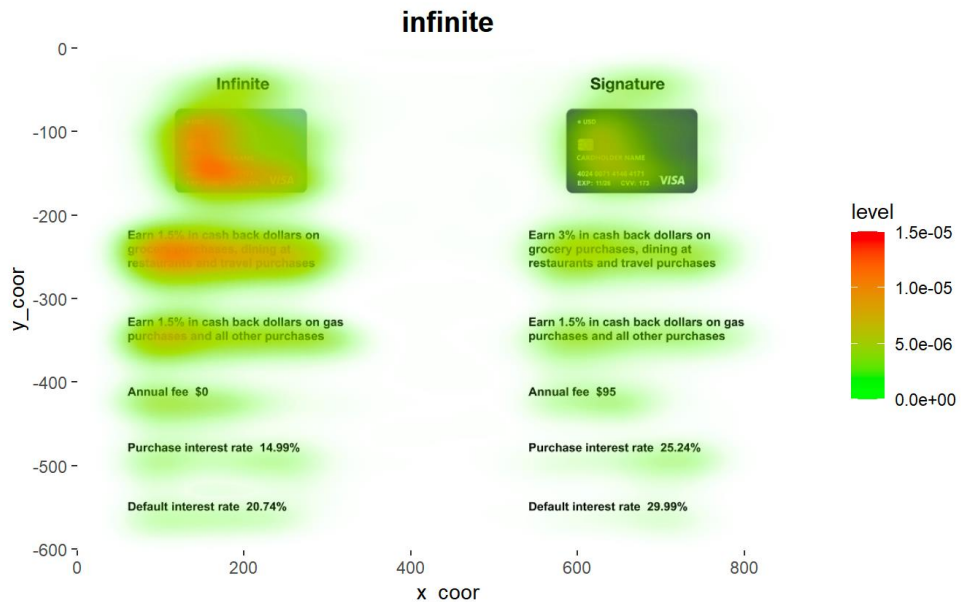
Heatmap of “eye gaze” (mouse locations)

Lower-income participants

Higher-income participants



14 AOIs

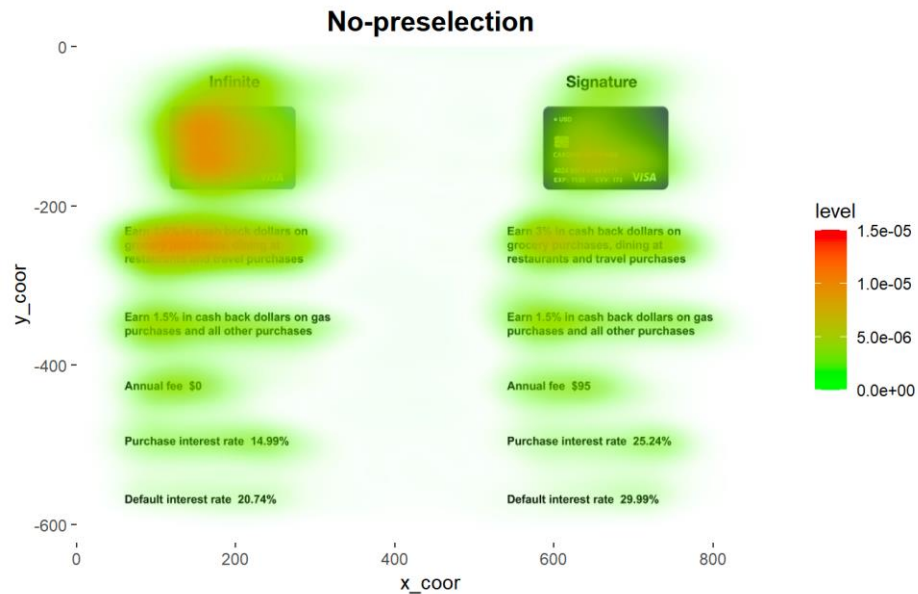


14 AOIs

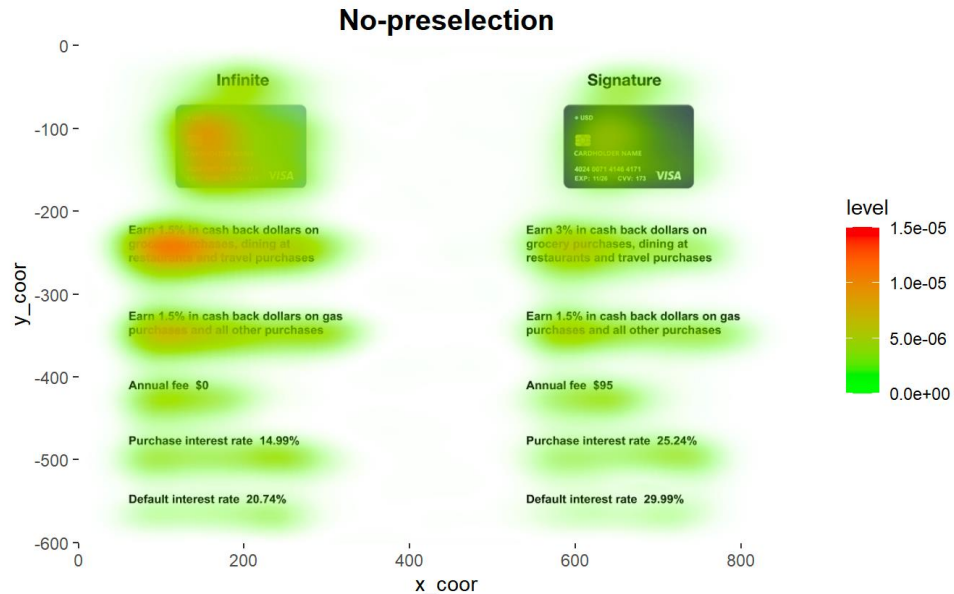
Heatmap of “eye gaze” (mouse locations)

Lower-income participants

Higher-income participants



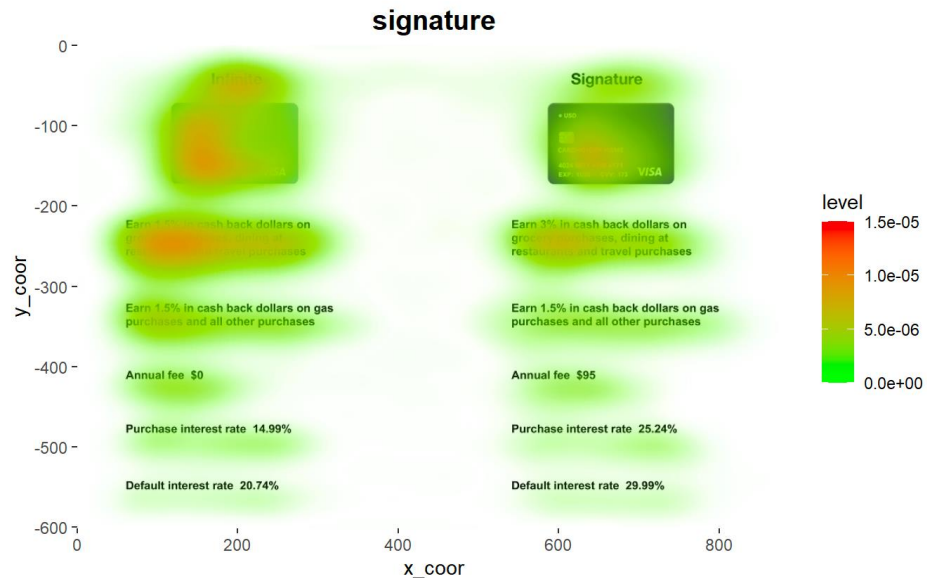
14 AOIs



14 AOIs

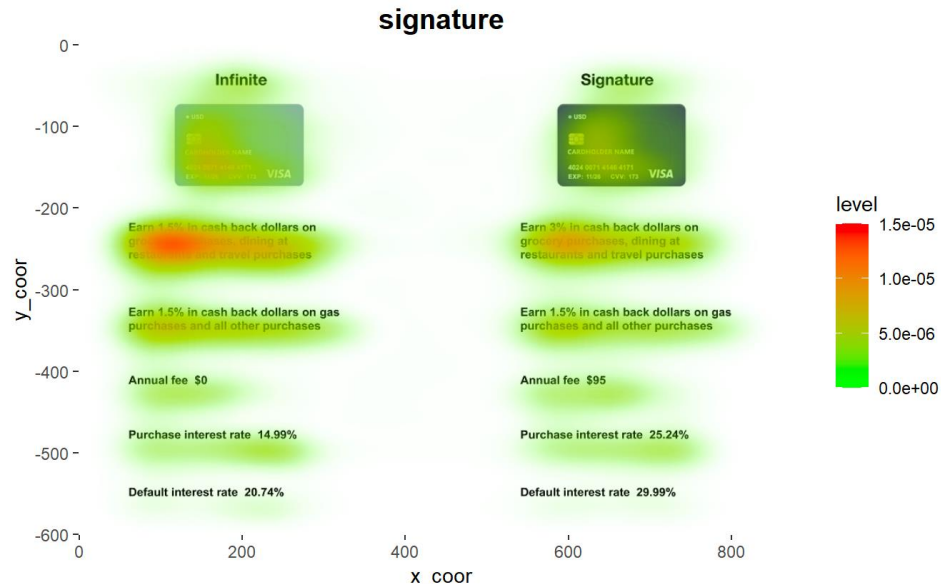
Heatmap of “eye gaze” (mouse locations)

Lower-income participants



14 AOIs

Higher-income participants



14 AOIs

Total dwell time

	infinite_preselected (N=69)	no_preselection (N=57)	signature_preselected (N=61)	Overall (N=187)
Dwelltotal_infinite				
Mean (SD)	16000 (20500)	18100 (20300)	16900 (20100)	17000 (20200)
Median [Min, Max]	11100 [0, 102000]	11500 [0, 78900]	12400 [0, 105000]	11500 [0, 105000]
Dwelltotal_signature				
Mean (SD)	12600 (16100)	14400 (18800)	14400 (17400)	13700 (17300)
Median [Min, Max]	9650 [0, 92600]	8450 [0, 84000]	9300 [0, 79300]	9300 [0, 92600]
Dwelltotal_2_cards				
Mean (SD)	40000 (43600)	45000 (43900)	46300 (48200)	43600 (45100)
Median [Min, Max]	31800 [1030, 226000]	37300 [2220, 194000]	34900 [911, 265000]	33400 [911, 265000]

Lower-income participants

	infinite_preselected (N=55)	no_preselection (N=68)	signature_preselected (N=64)	Overall (N=187)
Dwelltotal_infinite				
Mean (SD)	19200 (15500)	21300 (24800)	18400 (18600)	19700 (20300)
Median [Min, Max]	17800 [0, 65200]	14800 [0, 114000]	15800 [0, 103000]	16000 [0, 114000]
Dwelltotal_signature				
Mean (SD)	12900 (13200)	16600 (21400)	15700 (13600)	15200 (16800)
Median [Min, Max]	8530 [0, 64500]	8850 [0, 129000]	14800 [64.0, 73900]	11400 [0, 129000]
Dwelltotal_2_cards				
Mean (SD)	45800 (35000)	52300 (53300)	47300 (37600)	48700 (43200)
Median [Min, Max]	41500 [582, 168000]	35000 [4600, 282000]	43700 [2460, 201000]	40900 [582, 282000]

Higher-income participants

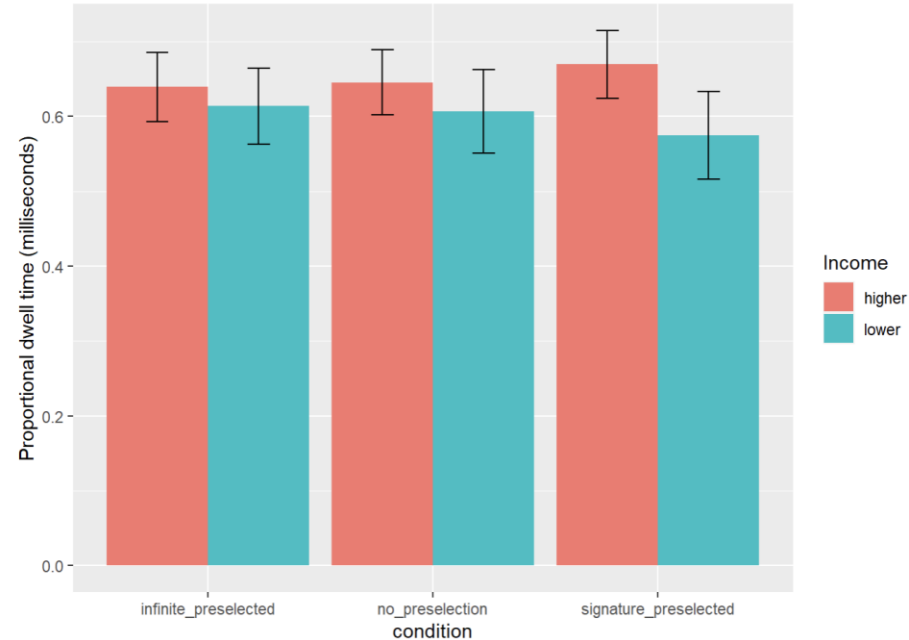
Attention: Proportional dwell time

(total dwell time on the 14 AOIs / total dwell time overall)

Main effect of income: $F(1,368)=.02$, $p<.01$, $\eta p^2=.018$

Main effect of conditions: $F(2,368)=6.76$, $p=.983$, $\eta p^2<.001$

Interaction effect: $F(2,368)=1.08$, $p=.341$, $\eta p^2=.006$



Lower-income participants paid less attention to the features of both cards

Irrelevant
features

Infinite



Signature



Relevant
features

Earn 1.5% in cash back dollars on grocery purchases, dining at restaurants and travel purchases

Earn 1.5% in cash back dollars on gas purchases and all other purchases

Annual fee \$0

Purchase interest rate 14.99%

Default interest rate 20.74%

Earn 3% in cash back dollars on grocery purchases, dining at restaurants and travel purchases

Earn 1.5% in cash back dollars on gas purchases and all other purchases

Annual fee \$95

Purchase interest rate 25.24%

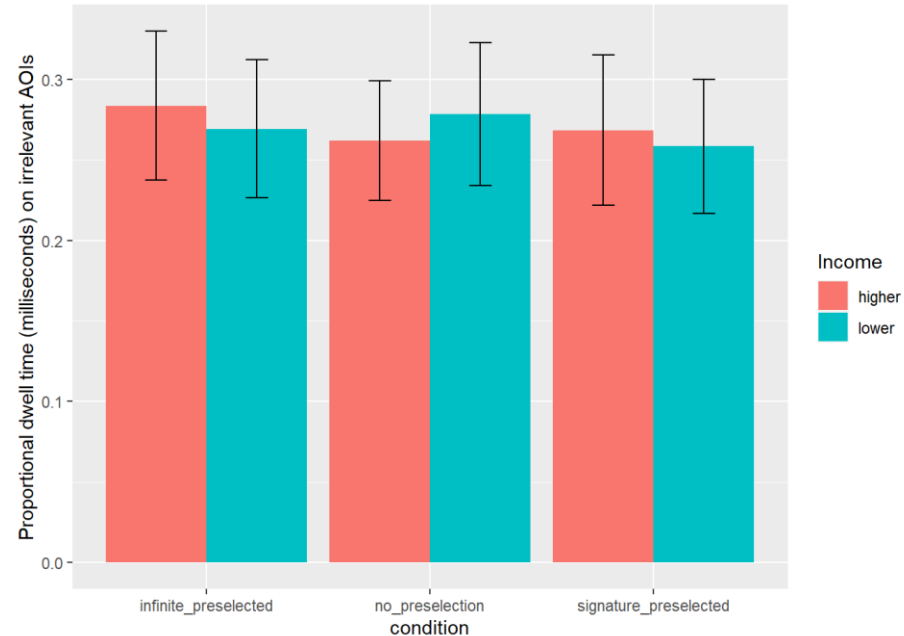
Default interest rate 29.99%

Attention to irrelevant features (card name + card) Proportional dwell time

Main effect of income: $F(1,368)=.02$, $p=.882$, $\eta p^2<.001$

Main effect of conditions: $F(2,368)=.16$, $p=.856$, $\eta p^2=.001$

Interaction effect: $F(2,368)=10.65$, $p=.744$, $\eta p^2=.002$



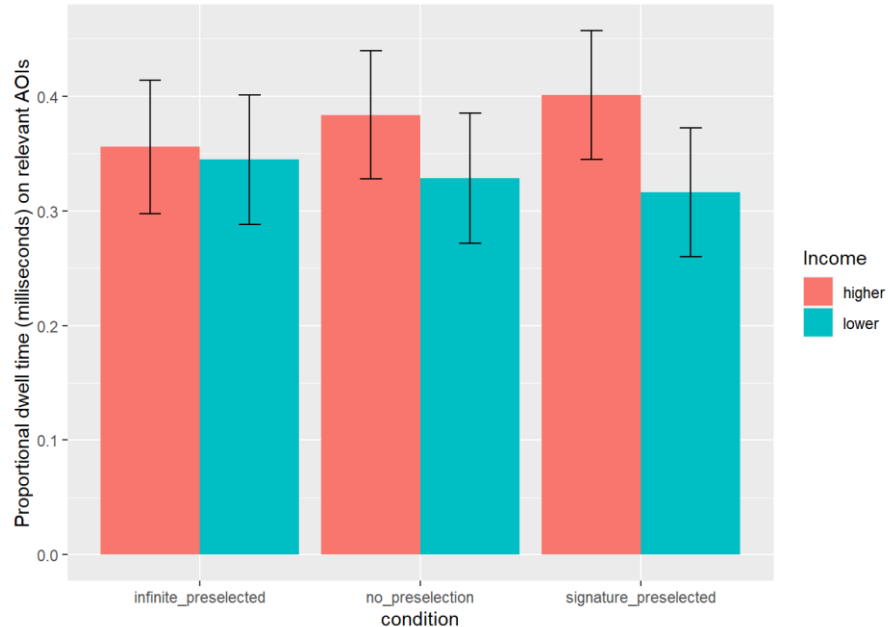
No difference in attention to irrelevant features

Attention to relevant features (cashback + annual fee + purchase rate + default rate) Proportional dwell time

Main effect of income: $F(1,368)=4.76$, $p=.030$, $\eta p^2=.013$

Main effect of conditions: $F(2,368)=.07$, $p=.929$, $\eta p^2<.001$

Interaction effect: $F(2,368)=.85$, $p=.430$, $\eta p^2=.005$



Lower-income participants paid less attention to the relevant features of both cards

Choice

Choice of the better card

Lower-income

	Infinite preselected	No preselection	Signature preselected
Yes	52	42	30
No	17	15	31

$$X^2(2, N=184)=11.93, p<.01$$

Infinite vs. no-preselection: $X^2(1, N=124)<.001, p=1$

Signature vs. no-preselection: $X^2(1, N=116)=6.44, p<.05$

Infinite vs. signature: $X^2(1, N=128)=8.44, p<.05$

Good default didn't benefit lower-income participants

Bad default hurt lower-income participants

Higher-income

	Infinite preselected	No preselection	Signature preselected
Yes	49	46	31
No	6	22	33

$$X^2(2, N=184)=22.25, p<.001$$

Infinite vs. no-preselection: $X^2(1, N=121)<.001, p<.05$

Signature vs. no-preselection: $X^2(1, N=130)=4.25, p=.118$

Infinite vs. signature: $X^2(1, N=117)=20.38, p<.001$

Good default benefited higher-income participants

Bad default didn't hurt higher-income participants

What predicts choice?

Lower-income participants

	Estimate	Std. Error	t value	Pr
DwellProptotal_2_cards	.08	.07	1.11	.270
Numeracy	-.02	.04	-.49	.627
Financial literacy	-.04	.04	-1.12	.265

R² adjusted=.115
 $p=.201$

Higher-income participants

	Estimate	Std. Error	t value	Pr
DwellProptotal_2_cards	-.07	.03	-.98	.329
Numeracy	.01	.04	.37	.711
Financial literacy	-.02	.04	-.49	.628

R² adjusted=.103
 $p=.262$

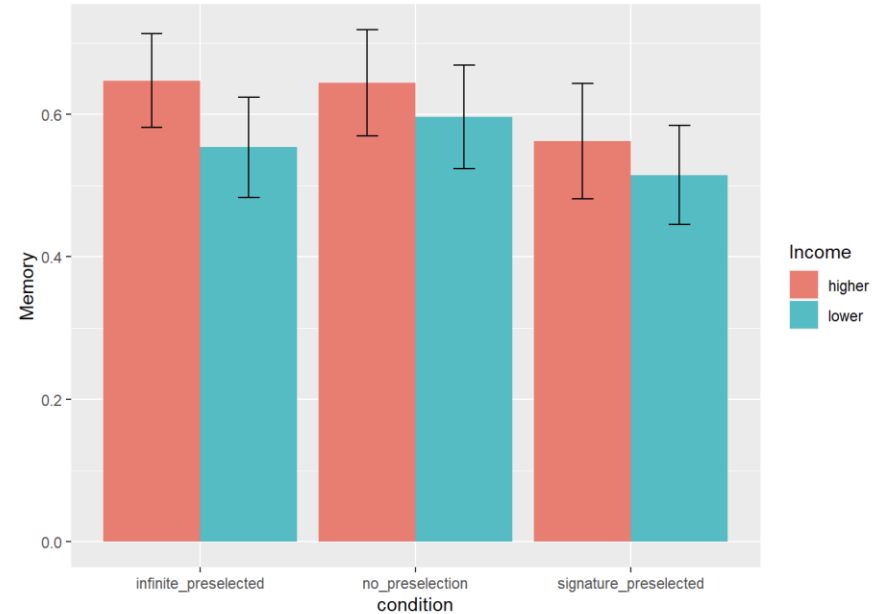
Memory

Memory

Main effect of income: $F(1,368)=4.41, p<.05, \eta p^2=.012$

Main effect of conditions: $F(2,368)=2.70, p=.068, \eta p^2=.014$

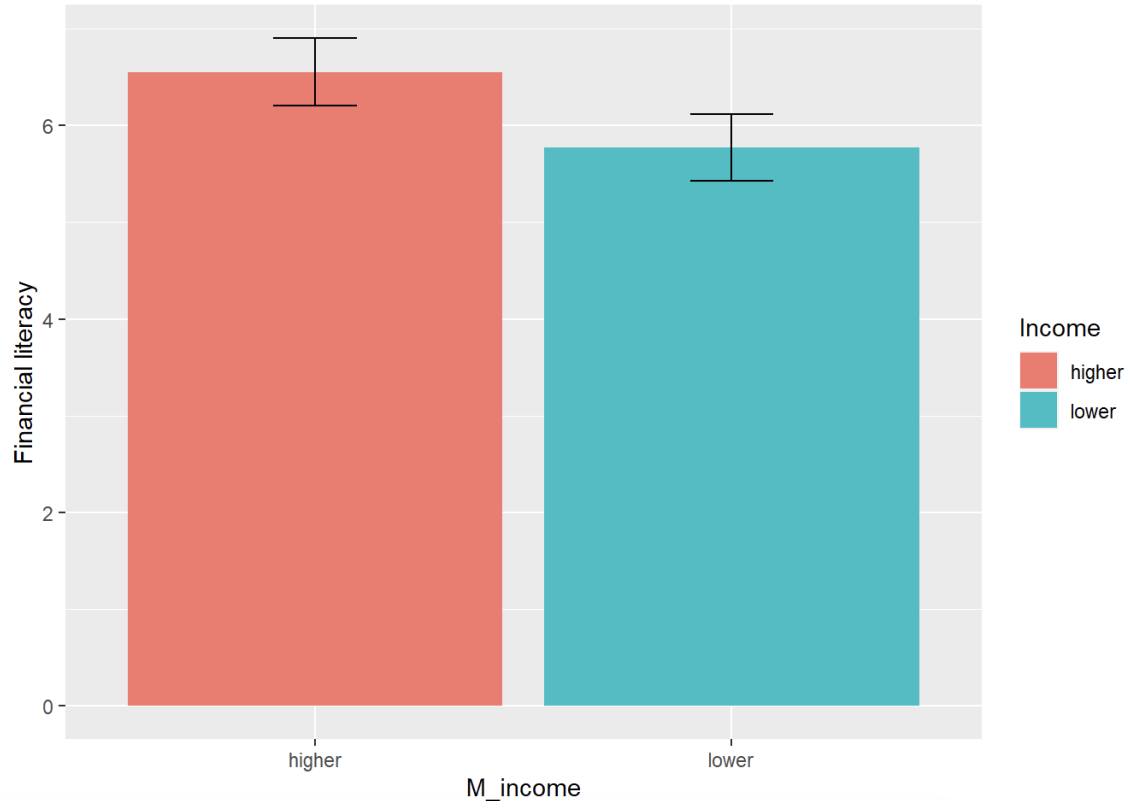
Interaction effect: $F(2,368)=.26, p=.855, \eta p^2=.001$



Lower-income participants showed worse memory of the card features

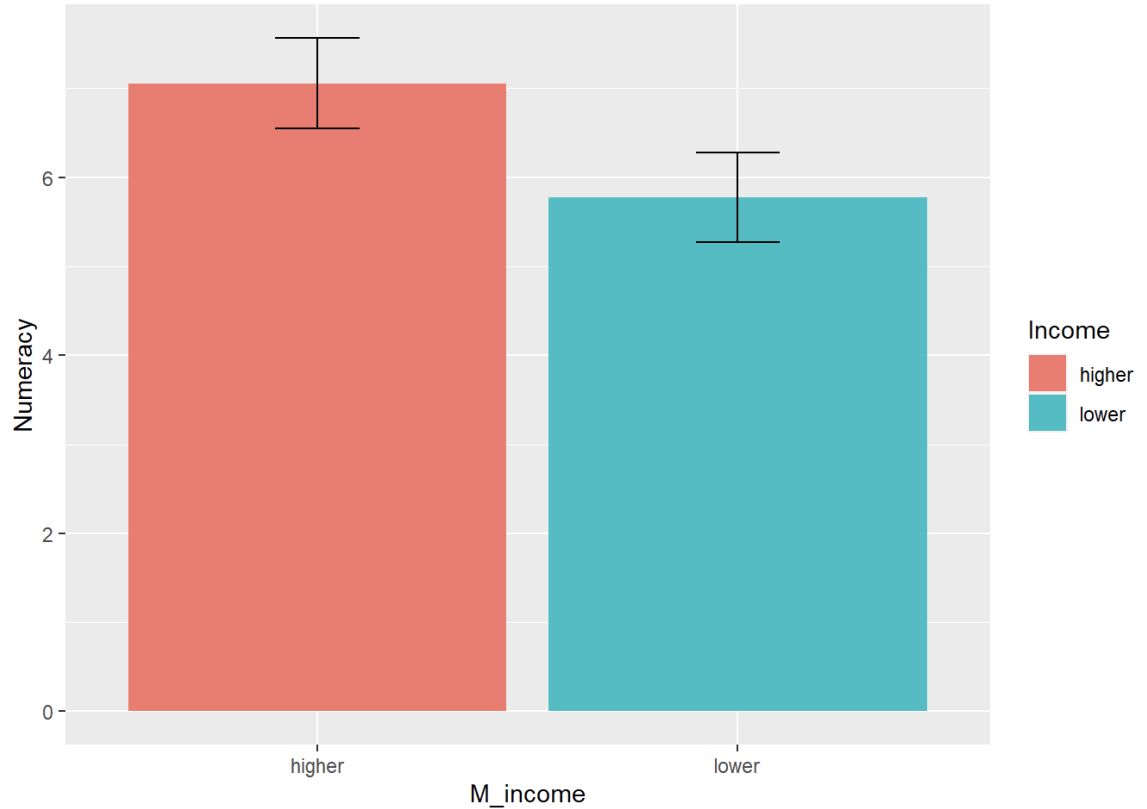
Financial literacy & Numeracy

Financial literacy



Lower-income participants showed significantly **lower financial literacy** than higher-income participants ($p < .001$).

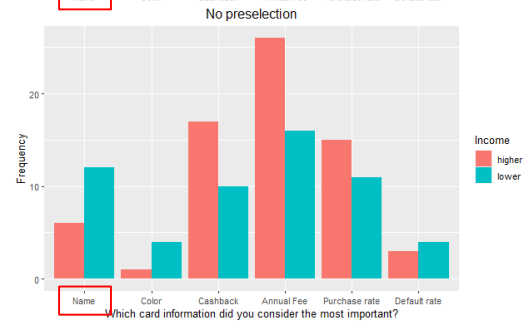
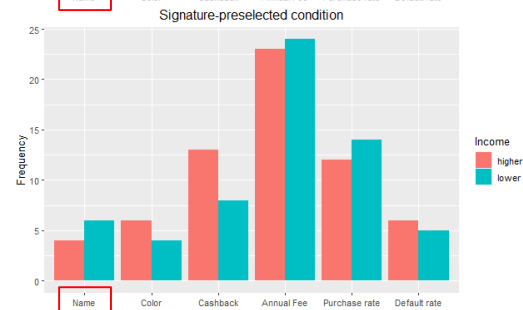
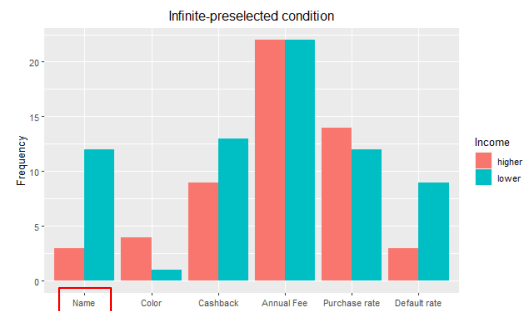
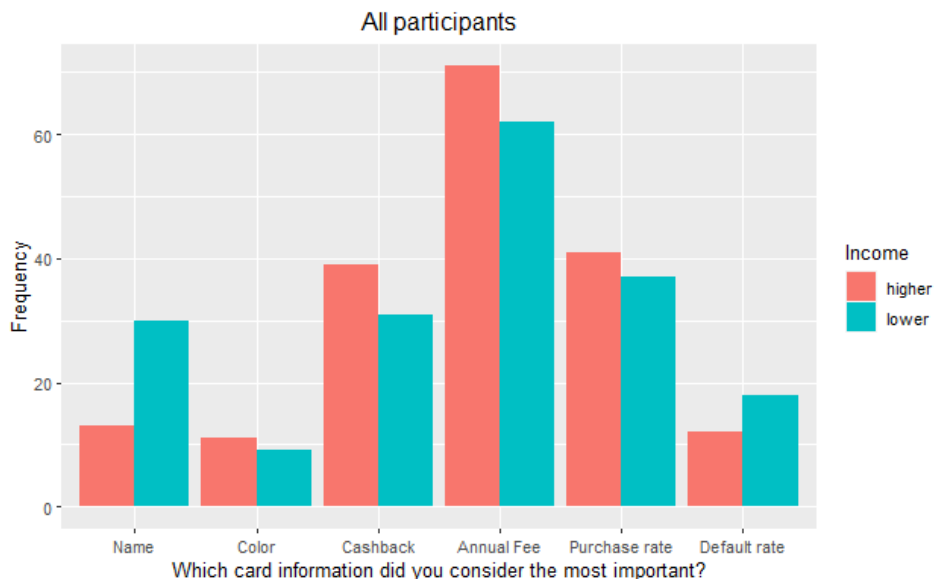
Numeracy



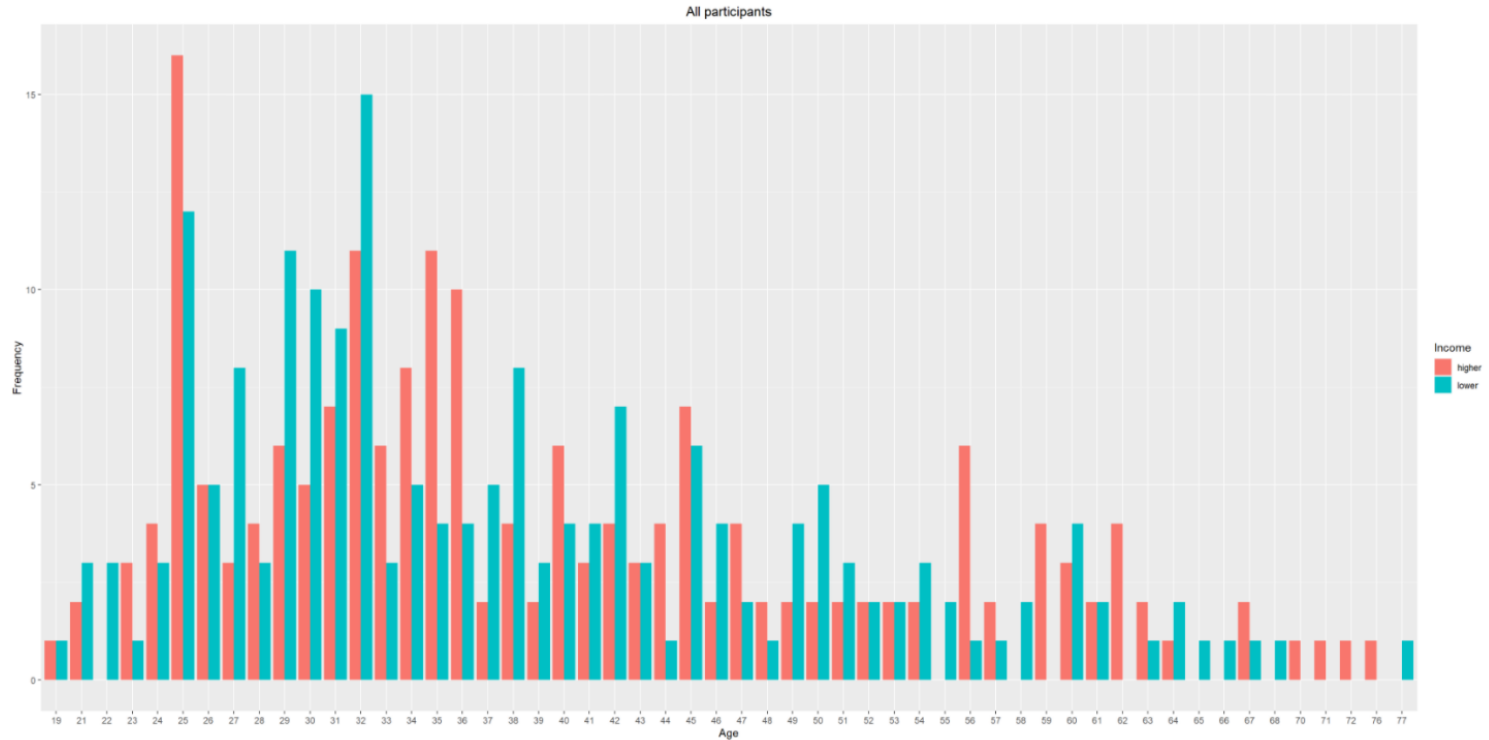
Lower-income participants showed significantly **lower numeracy** than higher-income participants ($p < .001$).

Demographics

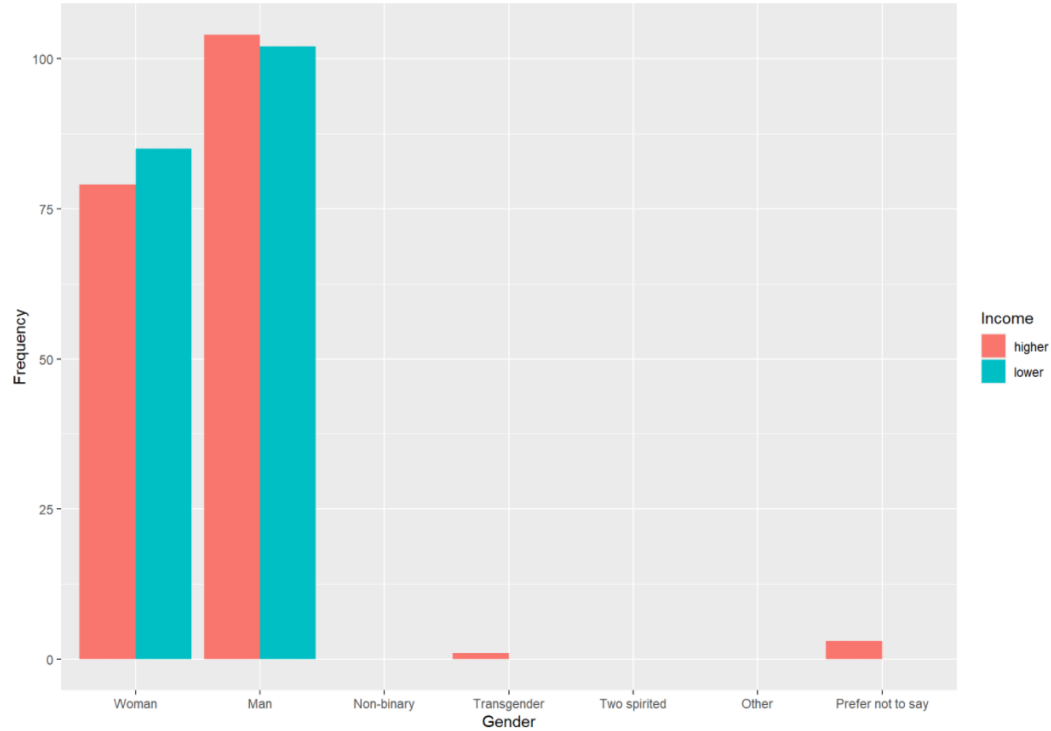
Perceived importance of card information



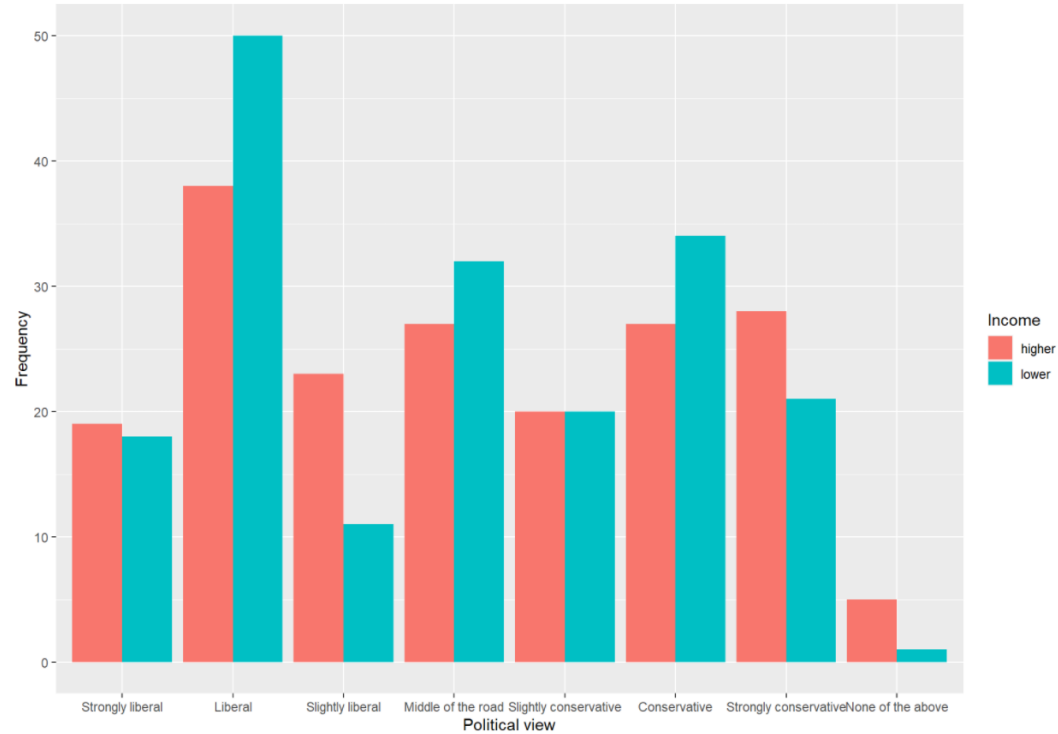
Demographics - Age



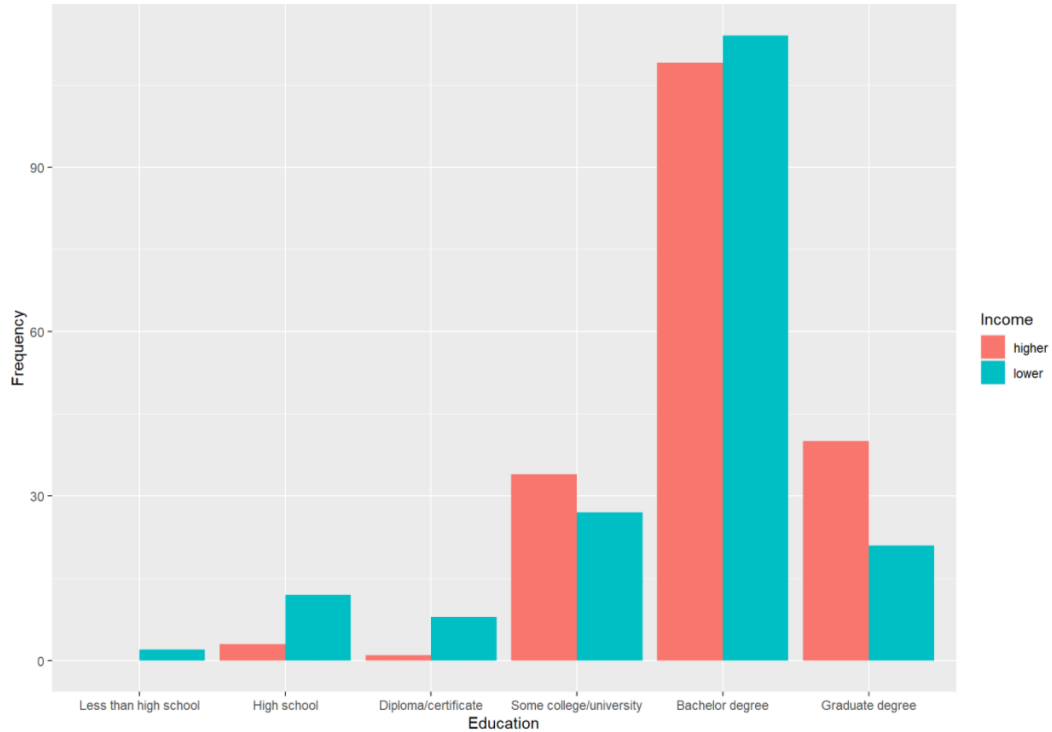
Demographics - Gender



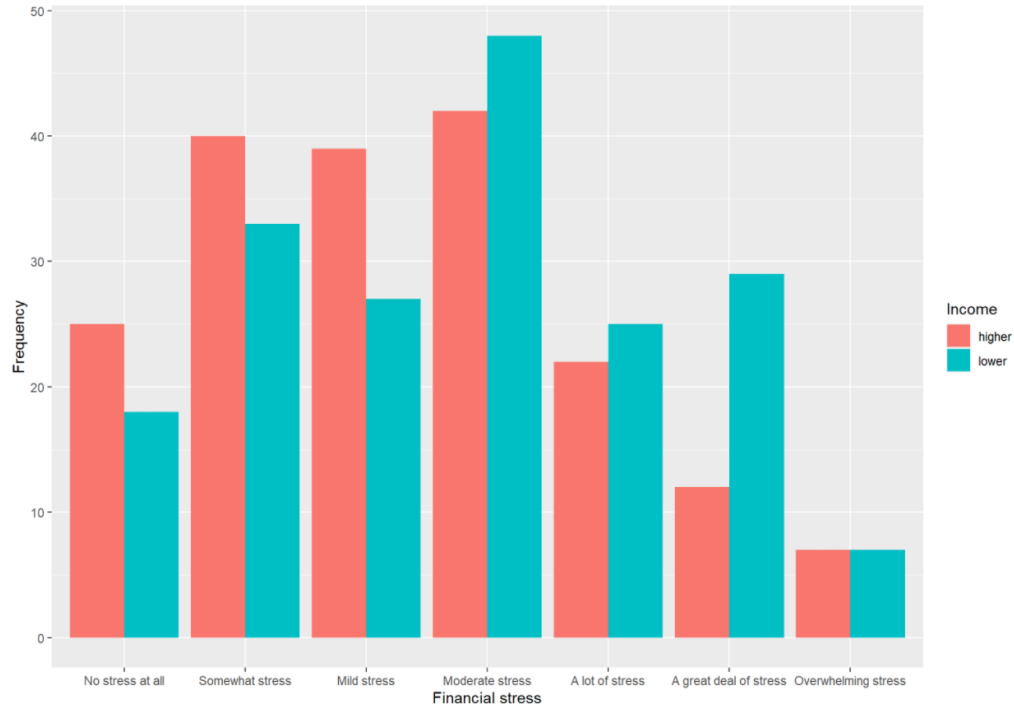
Demographics - Political view



Demographics - Education



Demographics - Financial stress



Lower-income participants showed significantly **more financial stress** than higher-income participants ($p < .01$).

Summary

Lower-income group significantly spent **less attention** to the key features on both cards compared to higher-income group

For irrelevant features, no difference in attention between lower- and higher-income participants

For relevant features, lower-income participants paid less attention than higher-income participants

Lower-income group showed significantly **lower memory accuracy** of card features compared to higher-income group

In terms of choice:

For the lower-income group, good default didn't benefit them but the bad default hurt them

For the higher-income group, the good default benefited them but the bad default didn't hurt them

Choice seemed to be driven more by attention than by numeracy and financial literacy

Implications

Spending behavior of people living in poverty: Misconceptions and interventions

Chaoyi (Lyra) Shi
Foundations for Social Change
Behavioral Sustainability Lab

*Some information is removed or modified due to confidentiality

Imagine an individual who lives in a large city in North America. This individual has experienced some financial difficulties in their life and has recently become homeless. This individual is at a low risk of mental health challenges and substance abuse. If this individual received an unconditional cash transfer of \$7,500, how much of the money would they spend on the following items?

Rent, food, clothing/shoes, transportation, on family members, durable goods (e.g., phones), recurring bills, alcohol/drug/ cigarettes, gambling...

Imagine you live in a large city in North America. You have experienced some financial difficulties in your life and have recently become homeless. You are at a low risk of mental health challenges and substance abuse. If you received an unconditional cash transfer of \$7,500, how much of the money would you spend on the following items?

Rent, food, clothing/shoes, transportation, on family members, durable goods (e.g., phones), recurring bills, alcohol/drug/ cigarettes, gambling...



THE NEW LEAF PROJECT

Background

Using direct unconditional cash transfers to reduce homelessness.



Financial choices



-39%

There has been a significant reduction in spending on goods such as alcohol, cigarettes, or drugs.

Insights

- A widespread misperception that people in poverty will spend money they receive on goods such as alcohol, cigarettes, or drugs
- Interventions should be implemented to reduce the misconceptions

Study 1 – show misconceptions

V1: Homelessness

V2: Target

	Yes	No
Self	homeless condition (self)	non-homeless condition (self)
Other	homeless condition (other)	non-homeless condition (other)

Study 1 – show misconceptions

The homeless condition (other)

Imagine an individual who lives in a large city in North America. This individual has experienced some financial difficulties in their life and has recently become homeless. This individual is at a low risk of mental health challenges and substance abuse. If this individual received an unconditional cash transfer of \$7,500, how much of the money would they spend on the following items?

Please estimate spending over one year, and make sure the total equals \$7,500.

Rent	\$	<input type="text" value="0"/>
Food	\$	<input type="text" value="0"/>
Clothing/shoes	\$	<input type="text" value="0"/>
Transportation (e.g. bus fare, taxi, etc.)	\$	<input type="text" value="0"/>
Spending on family members (e.g., children, parents, relatives, etc.)	\$	<input type="text" value="0"/>
Other recurring monthly spending (e.g., debt, medications, phone bill etc.)	\$	<input type="text" value="0"/>
Durable goods (e.g. computers, phones, bikes/cars, school fees, etc.)	\$	<input type="text" value="0"/>
Alcohol, drugs, cigarettes	\$	<input type="text" value="0"/>
Gambling (e.g., lottery tickets, casinos, etc.)	\$	<input type="text" value="0"/>
Other, please specify <input type="text"/>	\$	<input type="text" value="0"/>
Total	\$	<input type="text" value="0"/>



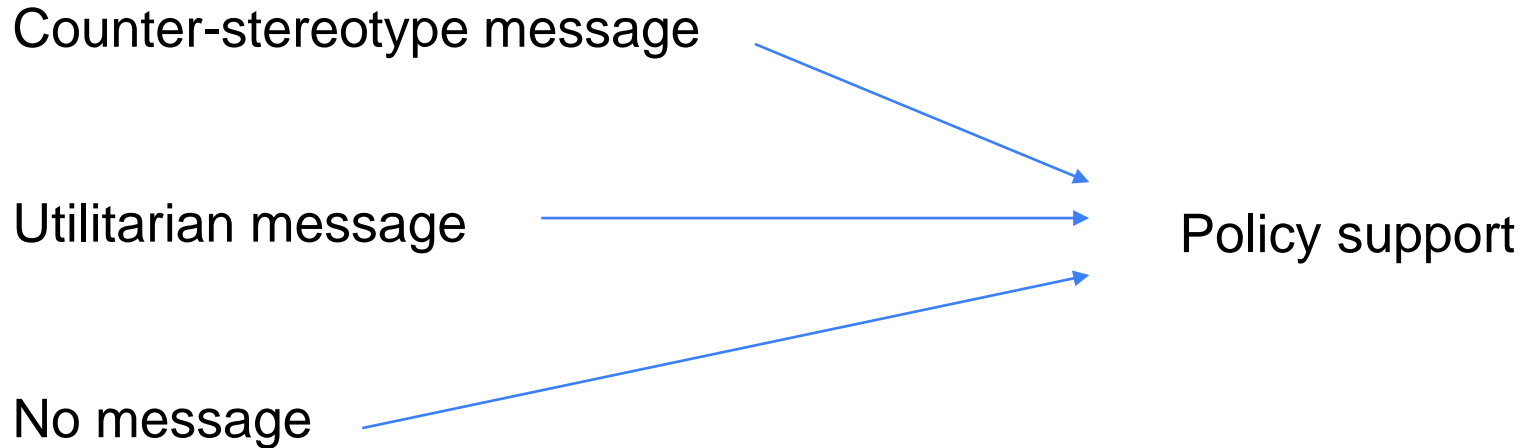
Study 1 – show misconceptions

V1: Homelessness

V2: Target

	Yes	No
Self	homeless condition (self)	non-homeless condition (self)
Other	homeless condition (other)	non-homeless condition (other)

Study 2 – reduce misconceptions



Study 2 – reduce misconceptions

Counter-stereotype message

homeless people who received a one-time unconditional cash transfer of \$7,500 reduced their spending on alcohol, drugs, and cigarettes, and increased their spending on rent, food, and clothing.

Study 2 – reduce misconceptions

Utilitarian message

homeless individuals who received a one-time unconditional cash transfer of \$7,500 reduced their reliance on the shelter system of care, resulting in cost savings to society.

How much do you support a public policy that distributes a one-time unconditional cash transfer of \$7,500 to people who are homeless and do not have a severe level of substance use, alcohol use, or mental health challenges?

- Strongly oppose
- Somewhat oppose
- Neutral
- Somewhat support
- Strongly support

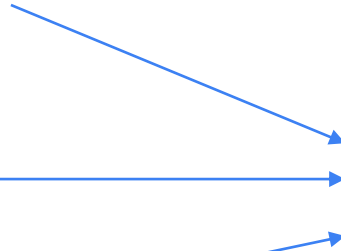
Study 2 – reduce misconceptions

Counter-stereotype message

Utilitarian message

No message

Policy support



Implications

Thank you!