

Peer Effects in Financial Decision Making: A Case of the Blind Leading the Blind?

Sandro Ambuehl,

University of Toronto and CESifo

Douglas Bernheim,

Stanford University

Fulya Ersoy,

Stanford University

Donna Harris

University of Oxford

2017 Cherry Blossom Financial Education Institute
The George Washington University School of Business
Washington, D.C., April 7

Motivation

People often consult non-expert advice for financial decisions

(Lusardi, 2003, 2008; van Rooij et al., 2011; Lusardi and Mitchell, 2014; Bernheim, 1998)

Social interaction affects personal financial decision making

(Beshears et al., 2015; Brown et al., 2014; Bursztyn et al., 2014; Cai et al., 2015; Duflo and Saez, 2003; Hvide and Ostberg, 2014; Hong et al., 2004, 2005; Kast et al., 2016; Ivkovic and Weisbenner, 2007)

Motivation

People often consult non-expert advice for financial decisions

(Lusardi, 2003, 2008; van Rooij et al., 2011; Lusardi and Mitchell, 2014; Bernheim, 1998)

Social interaction affects personal financial decision making

(Beshears et al., 2015; Brown et al., 2014; Bursztyn et al., 2014; Cai et al., 2015; Duflo and Saez, 2003; Hvide and Ostberg, 2014; Hong et al., 2004, 2005; Kast et al., 2016; Ivkovic and Weisbenner, 2007)

Are the effects beneficial / harmful?

Motivation

People often consult non-expert advice for financial decisions

(Lusardi, 2003, 2008; van Rooij et al., 2011; Lusardi and Mitchell, 2014; Bernheim, 1998)

Social interaction affects personal financial decision making

(Beshears et al., 2015; Brown et al., 2014; Bursztyn et al., 2014; Cai et al., 2015; Duflo and Saez, 2003; Hvide and Ostberg, 2014; Hong et al., 2004, 2005; Kast et al., 2016; Ivkovic and Weisbenner, 2007)

Are the effects beneficial / harmful?

Case of the blind leading the blind? (Bernheim, 1998)

- ▶ Even carefully designed, professional communication can fail to improve decision making, so why would the average peer to succeed? (Ambuehl, Bernheim, Lusardi, 2016)

“Two heads are better than one”?

- ▶ Often decision making better in groups (Charness and Sutter, 2012)

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?
(as defined on next slide)

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?
(as defined on next slide)

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems?
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Experimental choices

What amount $\pounds v^{\text{complex}}$ today is as good as receiving $\pounds 5$, invested at 1%, compounded daily, after 72 days?

Experimental choices

Each subject makes each choice twice, in two frames. Example:

- ▶ **Complex framing:** What amount $£v^{\text{complex}}$ today is as good as receiving £5, invested at 1%, compounded daily, after 72 days?
- ▶ **Simple framing:** What amount $£v^{\text{simple}}$ today is as good as receiving £10 in 72 days?

Experimental choices

Each subject makes each choice twice, in two frames. Example:

- ▶ **Complex framing:** What amount $\pounds v^{\text{complex}}$ today is as good as receiving $\pounds 5$, invested at 1%, compounded daily, after 72 days?
- ▶ **Simple framing:** What amount $\pounds v^{\text{simple}}$ today is as good as receiving $\pounds 10$ in 72 days?

Quality of decision making: *financial competence*

(Ambuehl, Bernheim, Lusardi, 2016)

- ▶ Correct application of compound interest $\rightarrow v^{\text{simple}} = v^{\text{complex}}$
- ▶ The larger the distance, the worse the decision quality

Experimental choices

Each subject makes each choice twice, in two frames. Example:

- ▶ **Complex framing:** What amount $\pounds v^{\text{complex}}$ today is as good as receiving $\pounds 5$, invested at 1%, compounded daily, after 72 days?
- ▶ **Simple framing:** What amount $\pounds v^{\text{simple}}$ today is as good as receiving $\pounds 10$ in 72 days?

Quality of decision making: *financial competence*

(Ambuehl, Bernheim, Lusardi, 2016)

- ▶ Correct application of compound interest $\rightarrow v^{\text{simple}} = v^{\text{complex}}$
- ▶ The larger the distance, the worse the decision quality

Virtues

- ▶ Non-paternalistic. Own preferences taken as benchmark.
- ▶ Formal interpretation within behavioral welfare economics:
 $|v^{\text{simple}} - v^{\text{complex}}|$ is maximal possible loss from deviation

Elicitation of $v^{complex}$

You will get the specified amount today

We will invest £5 in an account with 1% interest per day. Interest is compounded daily. We will pay you the proceeds in 72 days.

£20	<input type="checkbox"/>	<input type="checkbox"/>
£18	<input type="checkbox"/>	<input type="checkbox"/>
£16	<input type="checkbox"/>	<input type="checkbox"/>
⋮	⋮	⋮
£2	<input type="checkbox"/>	<input type="checkbox"/>
£0	<input type="checkbox"/>	<input type="checkbox"/>

Elicitation of $v^{complex}$

You will get the specified amount today

We will invest £5 in an account with 1% interest per day. Interest is compounded daily. We will pay you the proceeds in 72 days.

£20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£18	<input type="checkbox"/>	<input type="checkbox"/>
£16	<input type="checkbox"/>	<input type="checkbox"/>
⋮	⋮	⋮
£2	<input type="checkbox"/>	<input type="checkbox"/>
£0	<input type="checkbox"/>	<input type="checkbox"/>

Elicitation of $v^{complex}$

You will get the specified amount today

We will invest £5 in an account with 1% interest per day. Interest is compounded daily. We will pay you the proceeds in 72 days.

£20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£16	<input type="checkbox"/>	<input type="checkbox"/>
⋮	⋮	⋮
£2	<input type="checkbox"/>	<input type="checkbox"/>
£0	<input type="checkbox"/>	<input type="checkbox"/>

Elicitation of $v^{complex}$

You will get the specified amount today

We will invest £5 in an account with 1% interest per day. Interest is compounded daily. We will pay you the proceeds in 72 days.

£20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£16	<input type="checkbox"/>	<input checked="" type="checkbox"/>
⋮	⋮	⋮
£2	<input type="checkbox"/>	<input type="checkbox"/>
£0	<input type="checkbox"/>	<input type="checkbox"/>

Elicitation of $v^{complex}$

You will get the specified amount today

We will invest £5 in an account with 1% interest per day. Interest is compounded daily. We will pay you the proceeds in 72 days.

£20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£16	<input type="checkbox"/>	<input checked="" type="checkbox"/>
⋮	⋮	⋮
£2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
£0	<input type="checkbox"/>	<input checked="" type="checkbox"/>

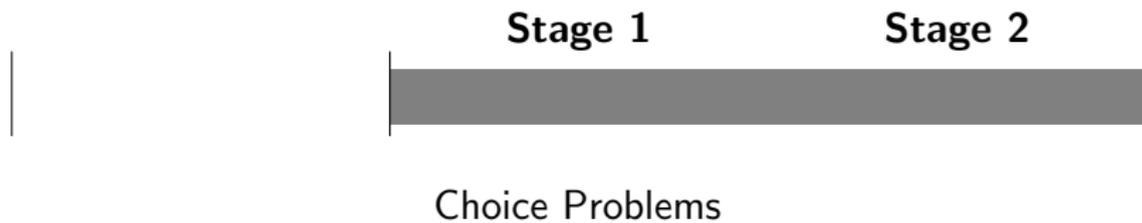
Elicitation of v ^{simple}

You will get the
specified amount
today

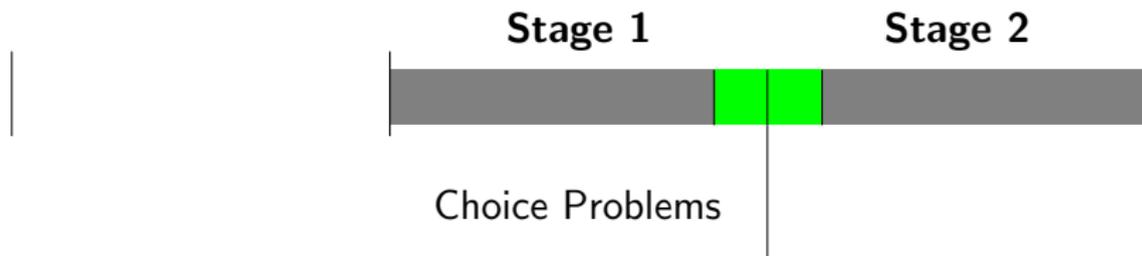
We will pay you
£10 in 72 days.

£20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
£16	<input type="checkbox"/>	<input checked="" type="checkbox"/>
⋮	⋮	⋮
£2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
£0	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Timeline



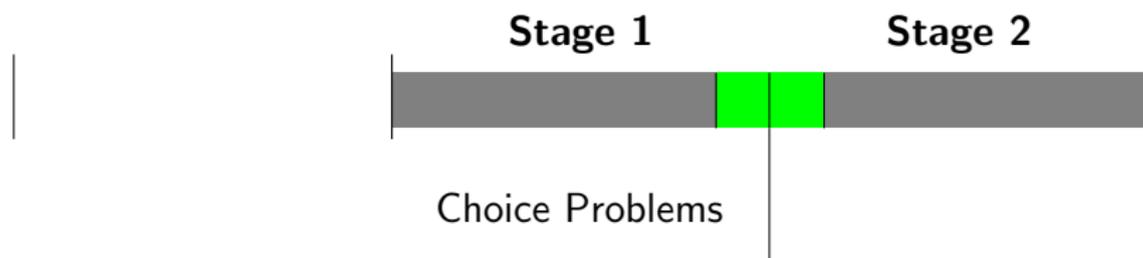
Timeline



Communication:

Discussion

Timeline



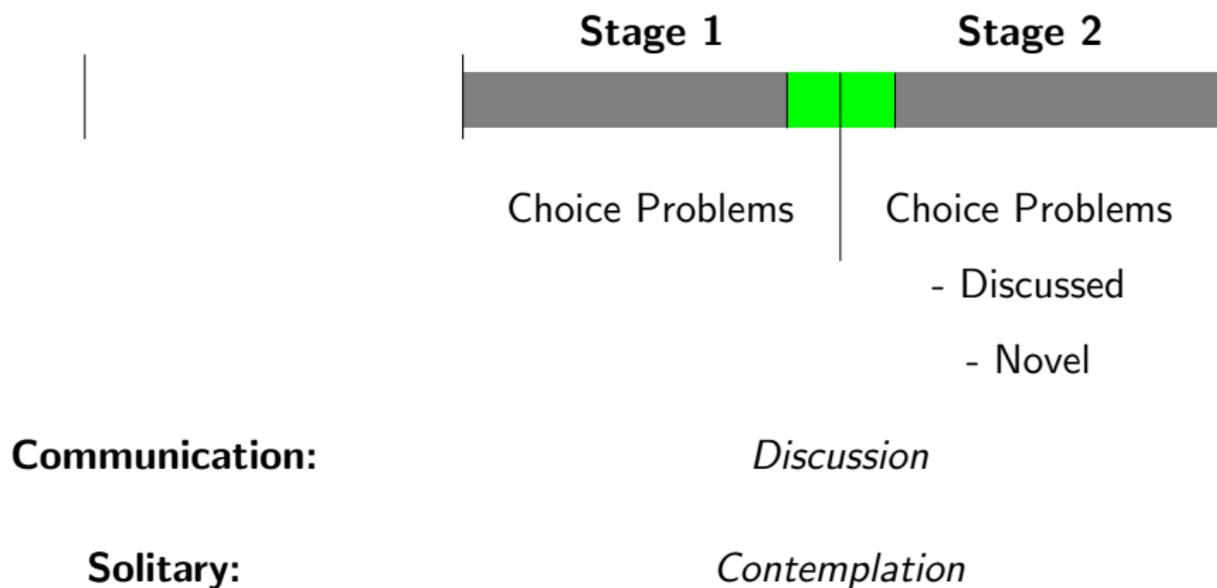
Communication:

Discussion

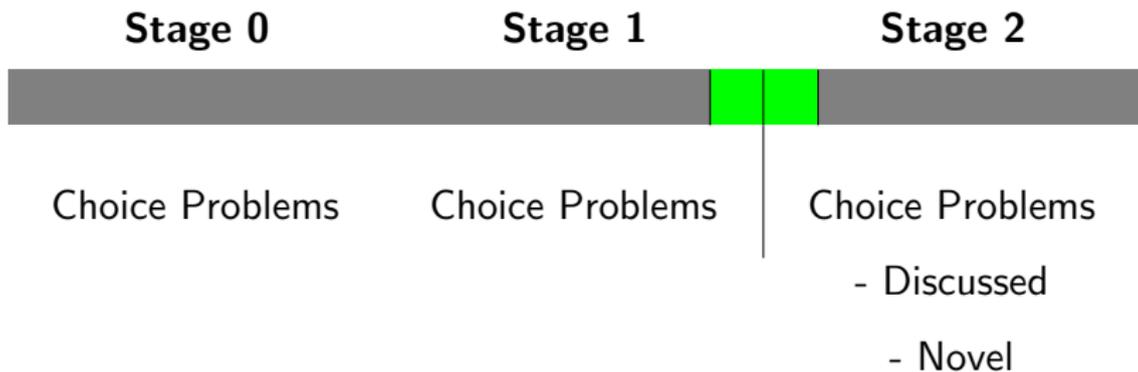
Solitary:

Contemplation

Timeline



Timeline



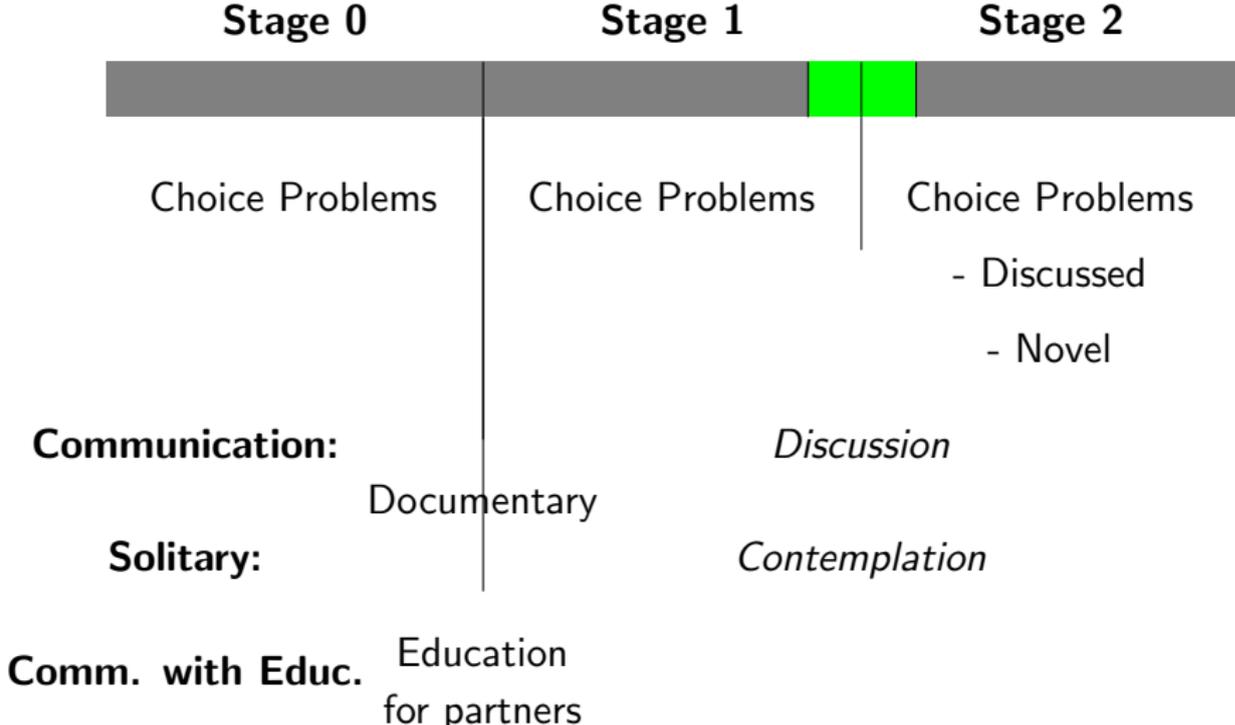
Communication:

Discussion

Solitary:

Contemplation

Timeline



Data

- ▶ 263 subjects
- ▶ University of Birmingham, UK, Fall 2015-Spring 2016
- ▶ Mean completion time 123.75 min, mean payment £26.55

Dependent Variable

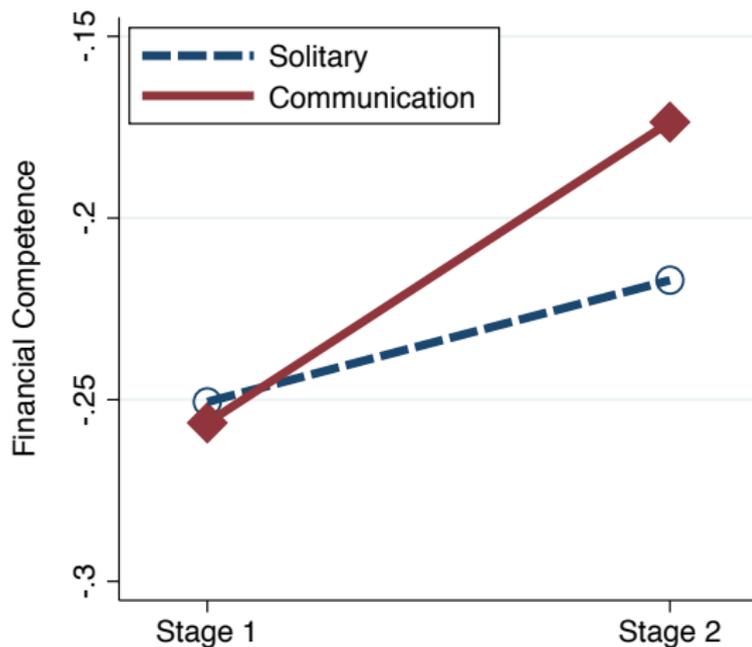
- ▶ Financial competence $-|v^{complex} - v^{simple}|$
- ▶ Normalized as if each future value was £1

Does communication help or hurt decision making quality?



Averaged across discussed and novel tasks. Slopes: Solitary: 0.016 (s.e. 0.018). Communication: 0.088*** (s.e. 0.017). Diff-in-diff: 0.072*** (s.e. 0.027). OLS, s.e. clustered by subject.

Does communication help or hurt decision making quality?



Averaged across discussed and novel tasks. Slopes: Solitary: 0.016 (s.e. 0.018). Communication: 0.088*** (s.e. 0.017). Diff-in-diff: 0.072*** (s.e. 0.027). OLS, s.e. clustered by subject.

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?
(as defined on next slide)

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems?
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems?
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Research Questions

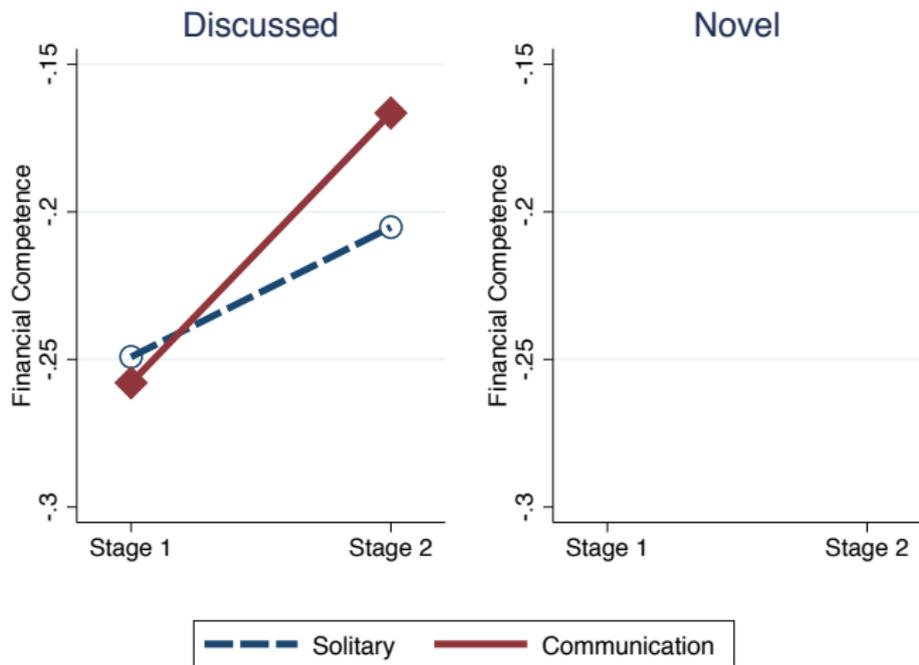
Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

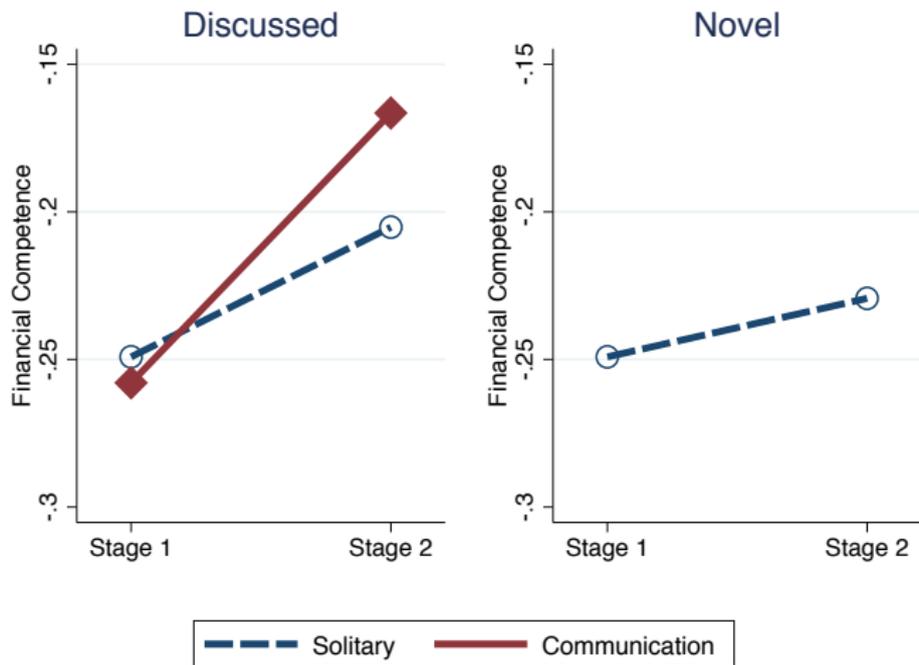
1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems?
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Conceptual learning or choice mimicry?



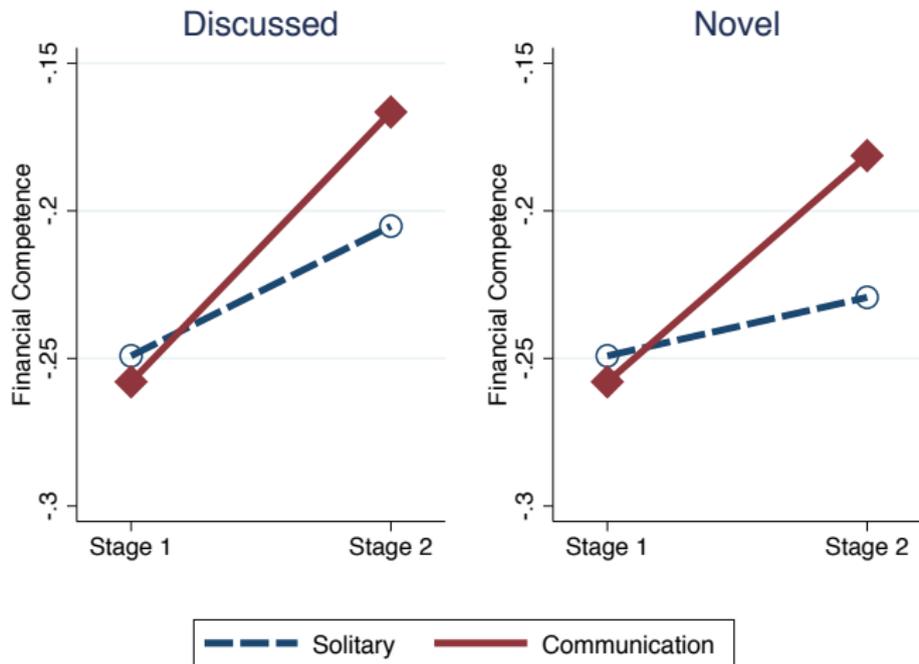
Slopes: solitary-discussed: 0.022 (s.e. 0.022), solitary-novel: 0.009 (s.e. 0.022), communication-discussed: 0.096*** (s.e. 0.019), communication-novel 0.081*** (s.e. 0.018). *Diff-in-diff:* discussed: 0.073** (s.e. 0.030), novel 0.071** (s.e. 0.029). OLS, s.e. clustered by subject.

Conceptual learning or choice mimicry?



Slopes: solitary-discussed: 0.022 (s.e. 0.022), solitary-novel: 0.009 (s.e. 0.022), communication-discussed: 0.096*** (s.e. 0.019), communication-novel 0.081*** (s.e. 0.018). *Diff-in-diff:* discussed: 0.073** (s.e. 0.030), novel 0.071** (s.e. 0.029). OLS, s.e. clustered by subject.

Conceptual learning or choice mimicry?



Slopes: solitary-discussed: 0.022 (s.e. 0.022), solitary-novel: 0.009 (s.e. 0.022), communication-discussed: 0.096*** (s.e. 0.019), communication-novel 0.081*** (s.e. 0.018). *Diff-in-diff:* discussed: 0.073** (s.e. 0.030), novel 0.071** (s.e. 0.029). OLS, s.e. clustered by subject.

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems?
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Research Questions

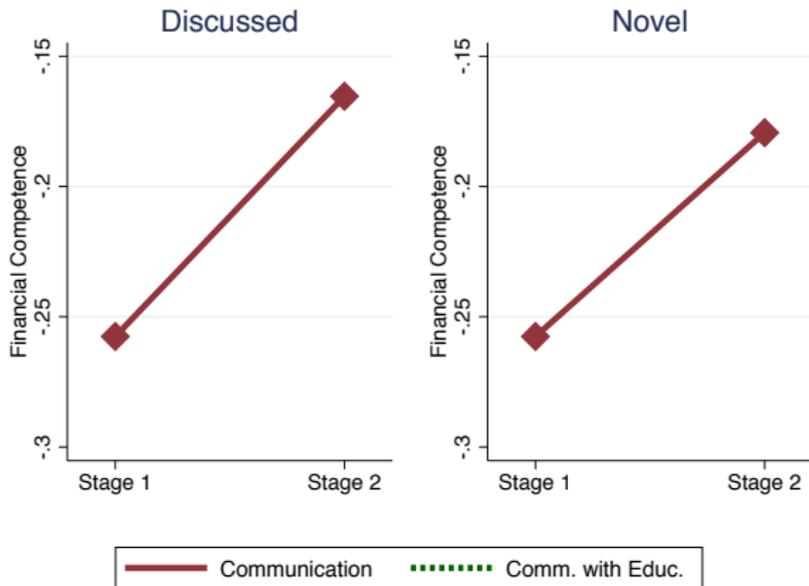
Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

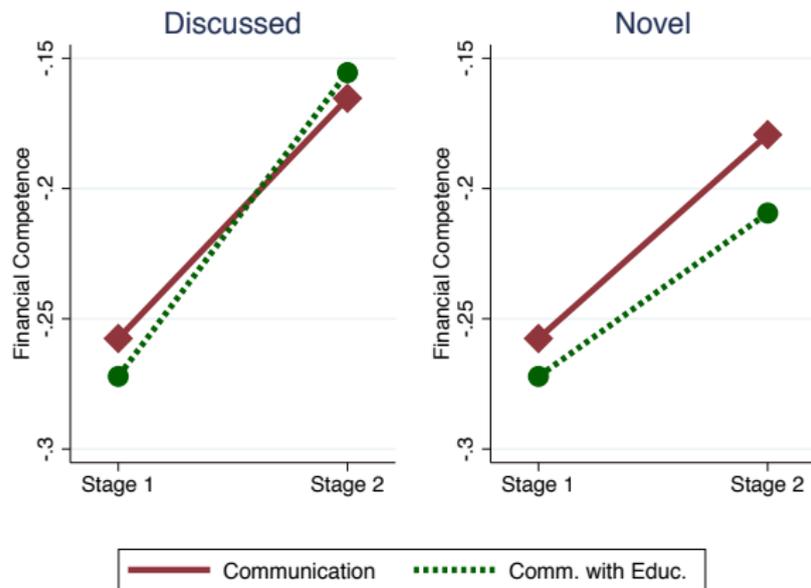
How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Indirect Effect of Education?

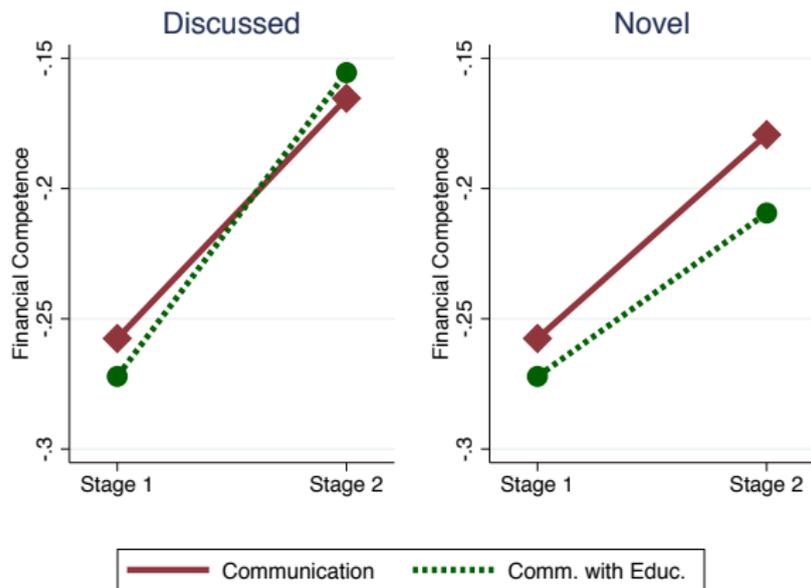


Indirect Effect of Education?



Slopes: Diff-in-diff communication with educated / not educated: 0.042, $p = 0.016$.

Indirect Effect of Education?



Slopes: Diff-in-diff communication with educated / not educated: 0.042, $p = 0.016$.

Discussion in % of pairs	<i>Communication</i>	<i>Com. with Educ.</i>
Rule of 72	2%	73.2%
Compound interest formula	63%	42%

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way?
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way? **Education indirectly helps through mimicking, but not improved understanding.**
2. Between whom is communication most / least beneficial?
3. (How) do people re-evaluate their preferences?

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way? **Education indirectly helps through mimicking, but not improved understanding.**
2. **Between whom is communication most / least beneficial?**
3. (How) do people re-evaluate their preferences?

Who benefits most from communication?

Hypothesis 1

Information flows from those who have it to those who do not (e.g. Jackson, Bruegman (2009) with elementary school teachers)

- ▶ Improve more the better the partner

Hypothesis 2

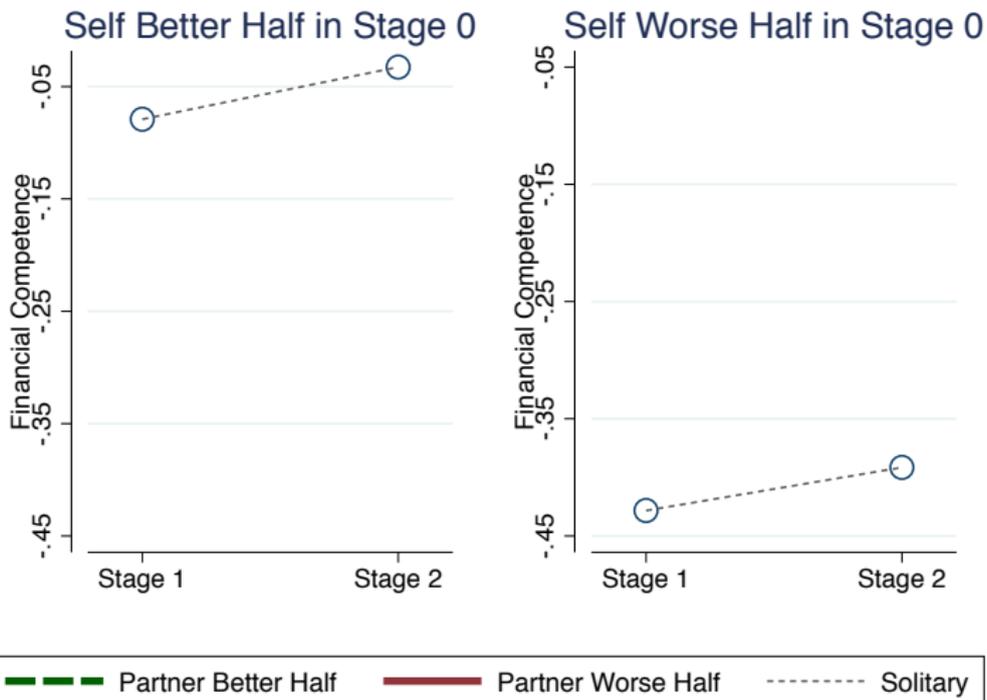
Skill transmission more effective between people of similar skills who can address concerns at appropriate level and pace (e.g. Booij, et al. 2016 and Feld, Zolitz, 2016 with univ. students)

- ▶ Improve more if partner more similar

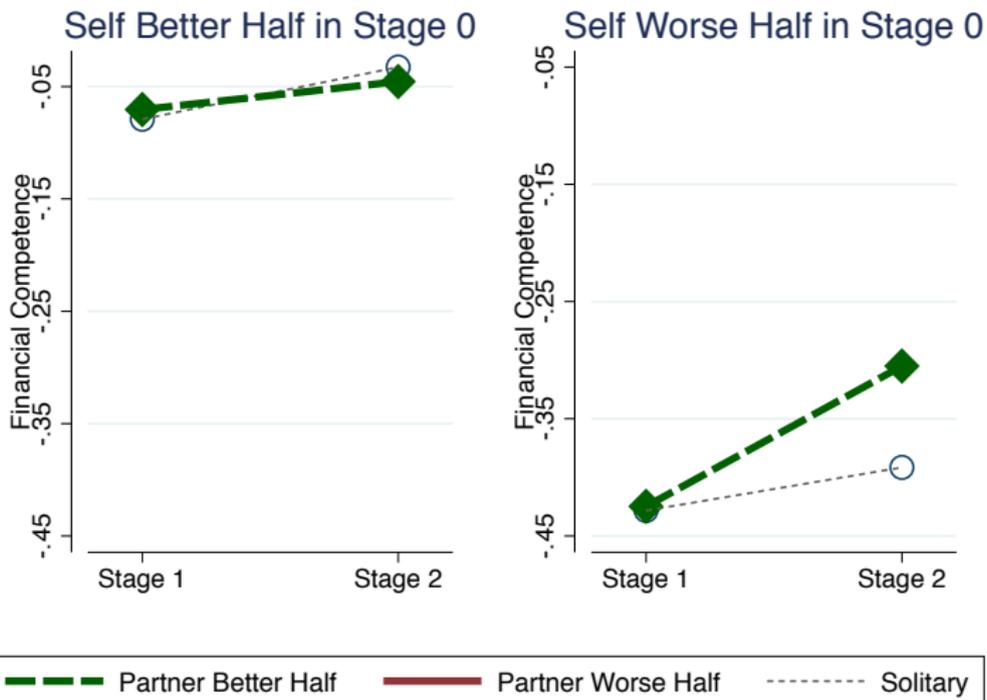
4 kinds of pairs

Classify using stage 0 decisions (to avoid regression to the mean)

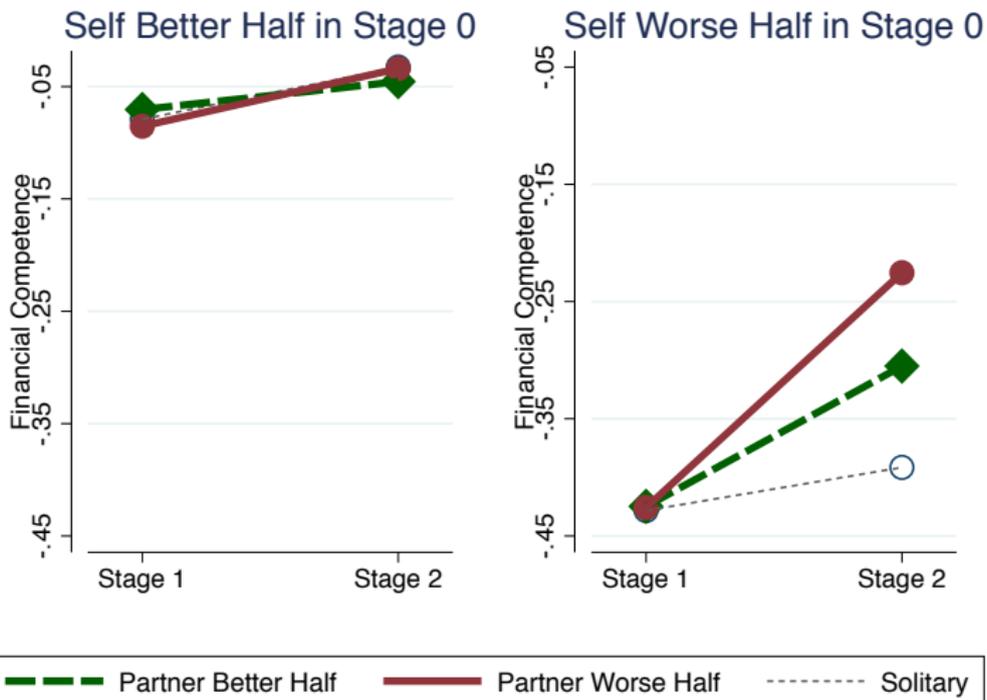
- ▶ Self in better / worse half
- ▶ Partner in better / worse half



Difference in slope Communication to Solitary: Self worse, partner worse: 16.4%*** (s.e. 2.2), Self worse, partner better: 8.29%*** (s.e. 2.13), Self better, partner worse: 0.48% (s.e. 2.47), Self better, partner better: -2.15% (s.e. 2.5). *Difference in better vs. worse partner:* Self worse: -8.06%*** (s.e. 2.18), Self better: -2.6% (s.e. 2.12). OLS, s.e. clustered by subject.



Difference in slope Communication to Solitary: Self worse, partner worse: 16.4%*** (s.e. 2.2), Self worse, partner better: 8.29%*** (s.e. 2.13), Self better, partner worse: 0.48% (s.e. 2.47), Self better, partner better: -2.15% (s.e. 2.5). *Difference in better vs. worse partner:* Self worse: -8.06%*** (s.e. 2.18), Self better: -2.6% (s.e. 2.12). OLS, s.e. clustered by subject.



Difference in slope Communication to Solitary: Self worse, partner worse: 16.4%*** (s.e. 2.2), Self worse, partner better: 8.29%*** (s.e. 2.13), Self better, partner worse: 0.48% (s.e. 2.47), Self better, partner better: -2.15% (s.e. 2.5). *Difference in better vs. worse partner:* Self worse: -8.06%*** (s.e. 2.18), Self better: -2.6% (s.e. 2.12). OLS, s.e. clustered by subject.

What do people discuss?

	Highlight similarity	Minutes discussed	# small talk topics (of 3)	# problems (of 6)
Similar (TT/BB)	80% (8%)	10.1 (0.8)	0.4 (0.1)	4.07 (0.29)
Different (TB/BT)	39.5% (8%)	8.3 (0.8)	0.66 (0.1)	4.17 (0.28)

Variables

- ▶ Highlight similarities e.g. “I’m bad at this too, let’s see whether we can help each other out”
- ▶ Small talk topics: Country of origin, college major, years of study

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way? **Education indirectly helps through mimicking, but not improved understanding.**
2. Between whom is communication most / least beneficial?
Between people with similar skill levels, as transmission requires 'common language'
3. (How) do people re-evaluate their preferences?

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way? **Education indirectly helps through mimicking, but not improved understanding.**
2. Between whom is communication most / least beneficial?
Between people with similar skill levels, as transmission requires 'common language'
3. **(How) do people re-evaluate their preferences?**

Does communication cause assimilation of discount rates?

- ▶ Estimate

$$\delta_2^{self} = \alpha + \beta \delta_1^{other} + (1 - \beta) \delta_1^{self} + \epsilon$$

- ▶ Attenuation bias: Instrument $(\delta_1^{self}, \delta_1^{other})$ with $(\delta_0^{self}, \delta_0^{other})$

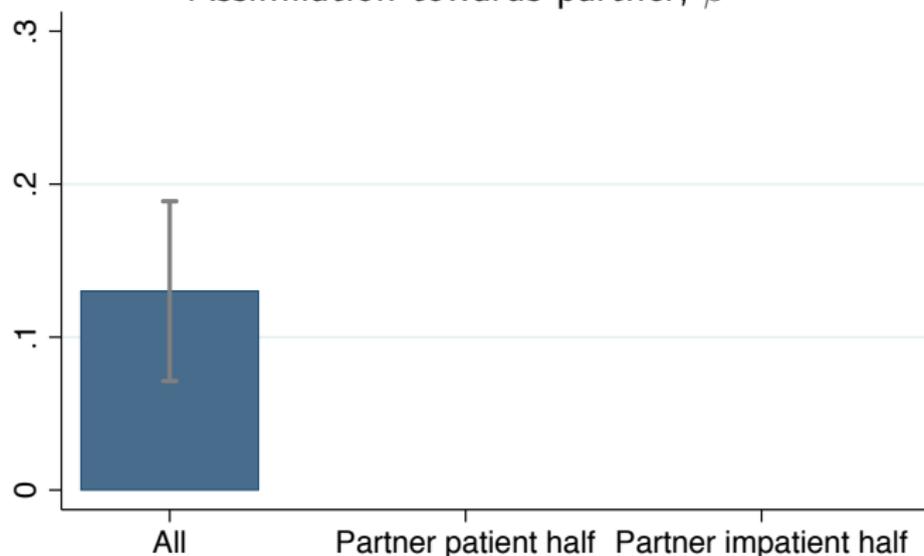
Does communication cause assimilation of discount rates?

- ▶ Estimate

$$\delta_2^{self} = \alpha + \beta \delta_1^{other} + (1 - \beta) \delta_1^{self} + \epsilon$$

- ▶ Attenuation bias: Instrument $(\delta_1^{self}, \delta_1^{other})$ with $(\delta_0^{self}, \delta_0^{other})$

Assimilation towards partner, β

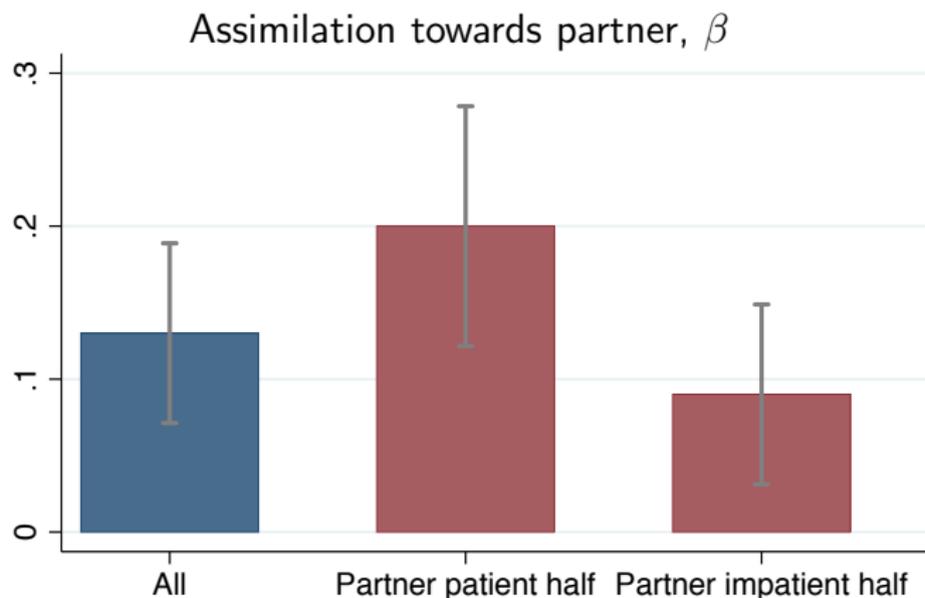


Does communication cause assimilation of discount rates?

- ▶ Estimate

$$\delta_2^{self} = \alpha + \beta \delta_1^{other} + (1 - \beta) \delta_1^{self} + \epsilon$$

- ▶ Attenuation bias: Instrument $(\delta_1^{self}, \delta_1^{other})$ with $(\delta_0^{self}, \delta_0^{other})$



Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way? **Education indirectly helps through mimicking, but not improved understanding.**
2. Between whom is communication most / least beneficial?
Between people with similar skill levels, as transmission requires 'common language'
3. **(How) do people re-evaluate their preferences?**

Research Questions

Does face-to-face communication with a randomly chosen peer improve or harm decision making quality?

Communication improves decision making

How and why?

1. Do subjects merely mimic other's choices, or do they acquire skills they can apply to new problems? **Can generalize**
 - ▶ Does financial education indirectly benefit others in the same way? **Education indirectly helps through mimicking, but not improved understanding.**
2. Between whom is communication most / least beneficial?
Between people with similar skill levels, as transmission requires 'common language'
3. (How) do people re-evaluate their preferences?
Subjects assimilate to peer. More so if peer more patient.

Policy implications

Financial decision making may be improved by encouraging communication

- ▶ Will be most effective if (e.g. in financial education interventions) people of similar skill level are paired
 - ▶ Related results in field experiments by Booij et al., 2016, and Feld & Zolitz, 2016
- ▶ By contrast, educating part of population and relying on diffusion may be ineffective

Further questions

- ▶ Role of confidence?
 - ▶ Our experiment: Ability and confidence highly correlated
 - ▶ Maybe less so in other contexts (e.g. Linnainmaa et al., 2016)
- ▶ Would effects be similar in less / more educated subject pools?