Social Capital and Loss Aversion in Discrete Choice Experiment

Hangjian Wu¹; Emmanouil Mentzakis¹; Marije Schaafsma²; Jianbo Hu³

1. Economics Department, University of Southampton
2. Geography Department, University of Southampton
3. Economics Department, Guizhou University of Finance and Economics

Envecon Conference

March 2019
Outline of Presentation

- Introduction of air pollution issue in China

- Gain-loss asymmetry
  - Motivation 1
  - Hypothesis 1
  - The Experiment
  - Result 1
  - Conclusion 1 & Policy Implication 1

- Social Capital
  - Motivation 2
  - Hypothesis 2
  - Result 2
  - Conclusion 2 & Policy Implication 2
Introduction of the air pollution issue

Estimated mortality due to air pollution in China (annually)

- 0.35-0.5 million (Chen et al, 2013)
- 1.03 million WHO (2016)
- 1.57 million GHDx (2016)
Introduction of the air pollution issue

Most polluted cities in the world (PM10, from 2011-2016)

Data source: WHO (2016)
Motivation 1: Trade-offs between air quality and economic growth

- Recent stringent air pollution policies maybe **unsustainable**
  - Industry
    - Shutting down too many polluting factories may **harm** economic growth
  - Citizens
    - Banning coal heating in 2017, while gas heating is sometimes unavailable and expensive: Millions in rural areas are left in chilly wind
  - Country
    - Slower economic growth due to external reasons, but economic growth rate has to be maintained for political reasons.

Thus, the government has incentives to **reduce air policy implementations** to avoid sacrifice too much economic growth, which may lead to air quality deterioration
Motivation 1: Trade-offs between air quality and economic growth

- So we need to measure welfare loss due to air quality deterioration
  - but can we infer this information from welfare gain due to air quality improvement?
  - In other words: if £10 = 10% air quality improvement, then £10 = 10% air quality deterioration?

- **Loss aversion** suggests asymmetrical responses, ignoring this possible asymmetry leads to **biased** welfare estimates

- Cost-benefit analysis: a **simultaneous** benefit measure that accounts for both air quality improvement and deterioration is needed
The Study Area and Sample

- Study Area: Beijing, China
- Sample size: 230
- Web survey
- Each respondent face 10 choice cards in DCE
# The Discrete Choice Experiment

## An Example of Choice Cards (English version)

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Policy A</th>
<th>Policy B</th>
<th>Current policies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health</strong> <em>(Hospital admission/year)</em></td>
<td>145 thousands per year (15 thousands more, or 11% more)</td>
<td>120 thousands per year (10 thousands less, or 7.5% less)</td>
<td>130 thousands per year (no change)</td>
</tr>
<tr>
<td><strong>Visibility</strong> <em>(number of bad visibility days per month)</em></td>
<td>12 days of bad visibility per month (4 days more)</td>
<td>4 days of bad visibility per month (4 days less)</td>
<td>8 days of low visibility per month (no change)</td>
</tr>
<tr>
<td><strong>Cost per household per month</strong> <em>(change in electricity, gas, heating bill)</em></td>
<td>100 RMB/month decrease (1200 RMB/year decrease)</td>
<td>100 RMB/month increase (1200 RMB/year increase)</td>
<td>No change in bill</td>
</tr>
</tbody>
</table>
# Attributes and Levels

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Level -3</th>
<th>Level -2</th>
<th>Level -1</th>
<th>Current Situation</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health effect (hospital admission/year)</td>
<td>150 thousands</td>
<td>145 thousands</td>
<td>140 thousands</td>
<td>130 thousands</td>
<td>120 thousands</td>
<td>115 thousands</td>
<td>110 thousands</td>
</tr>
<tr>
<td>Visibility effect (bad visibility)</td>
<td>/</td>
<td>12 days/month</td>
<td>10 days/month</td>
<td>8 days/month</td>
<td>6 days/month</td>
<td>4 days/month</td>
<td>/</td>
</tr>
<tr>
<td>Change in bill (RMB/month)</td>
<td>500 RMB decrease</td>
<td>300 RMB decrease</td>
<td>100 RMB decrease</td>
<td>No change in bill</td>
<td>100 RMB increase</td>
<td>200 RMB increase</td>
<td>500 RMB increase</td>
</tr>
</tbody>
</table>

**Note:** 500 RMB ≈ 50 pound
Hypothesis 1

- Respondents prefer **avoiding losses** over **acquiring gains** for the air quality changes (implying loss aversion behaviour)
### Results: Hypothesis 1

<table>
<thead>
<tr>
<th>Asymmetric specification</th>
<th>Coefficient</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASC</strong></td>
<td>-1.302***</td>
<td>1.321***</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost increase</td>
<td>-0.002***</td>
<td>fixed</td>
</tr>
<tr>
<td>Cost decrease</td>
<td>-0.000</td>
<td>fixed</td>
</tr>
<tr>
<td>Health ↑</td>
<td>0.580***</td>
<td>1.120***</td>
</tr>
<tr>
<td>Health ↓</td>
<td>-0.972***</td>
<td>1.653***</td>
</tr>
<tr>
<td>Visibility ↑</td>
<td>0.066*</td>
<td>0.185***</td>
</tr>
<tr>
<td>Visibility ↓</td>
<td>-0.170***</td>
<td>0.305***</td>
</tr>
</tbody>
</table>

(a) ASC is alternative specific constant.
(b) The symbol ↑ means improvement, and ↓ means deterioration.
(c) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Conclusion 1 and Policy Implication 1

➢ Conclusions 1: People **prefer avoiding losses** than acquiring gains for air quality (loss aversion behaviour)

➢ Implication 1:
  • A reminder for policy-makers: Social costs of sacrificing air quality for economic growth maybe **higher** than expected
Motivation 2: The effects of Social Capital on Environmental Preference

Social capital as a resource can be used to facilitate co-operation within the society, thus is valuable to combat environmental issues (Putnam, 1993)
Hypothesis 2

- H2a: Social capital is **positively** correlated with preference for air quality improvement

- H2b: Social capital is **negatively** correlated with preference for air quality deterioration
Results: Hypothesis 2 a & b

Coefficients of social capital indicators (Health improvement)

Note: The coefficients are obtained from the interactions of social capital indicators with health improvement variable in a mixed logit model.
Results: Hypothesis 2 a & b

Coefficients of social capital indicators (Health deterioration)

- Note: The coefficients are obtained from the interactions of social capital indicators with health deterioration variable in a mixed logit model.
Results: Hypothesis 2 a & b

Coefficients of social capital indicators *(Cost increase)*

Note: The coefficients are obtained from the interactions of social capital indicators with *cost increase* variable in a mixed logit model
Results: Hypothesis 2 a & b

Coefficients of social capital indicators (Cost decrease)

Note: The coefficients are obtained from the interactions of social capital indicators with cost decrease variable in a mixed logit model.
Conclusion 2 and Policy Implications 2

➢ Conclusions 2: Those with **higher** social capital scores:

(1) Prefer **more** air quality improvement, but feel **more** distaste towards air quality deterioration
   • Implication:
     (a) Social capital could be an important way to **nudge** pro-environmental behaviour
     (b) Social capital may **hinder** governments’ *maintain economic growth rate* plan if the air quality is deteriorated

(2) Care **less** about paying money for air quality improvement, but are **more** resistant to monetary compensations due to air quality deterioration
   • Implication:
     (a) Monetary compensations may **not** be a feasible way for certain groups of people
Thank you

Presenter: Hangjian Wu


References

References


Appendix 1 How current levels of attributes being calculated

1. Health effect

Beijing Municipal Environmental Protection Bureau’s data: annual general hospital admission = 589 thousands

Transformation Rate (TR): every 10ug/m3 increase was associated with X% increase of air pollutants:

- PM2.5 coefficients: 0.23% (Xu et al., 2013)
- SO2 coefficients: 0.76% (Zhang et al., 2015)
- NO2 coefficients: 1.82% (Zhang et al., 2015)
- PM10 coefficients: 0.88% (Zhang et al., 2015)
- O3 coefficients: 0.33% (Tian et al., 2018)

Air pollutants average levels in Beijing in 2017 (Airy Map company—environmental data development)
- PM2.5: 52.5
- SO2: 5.5
- NO2: 42.7
- PM10: 84.7
- O3: 160.5

Example: TR (total) = TR(pm2.5) + TR(SO2) + ... = 0.23% * 52.5 / 10 + ...; Air(HA) = GHA * TR (total) = 130000

Comparing with information from a news: 85000 (comparable)
2. Visibility effect

Rizzi (2014):
Number of months with Highest 75% PM2.5 during the year/30 in each area
Dara: (Airy Map company, Beijing average PM2.5 in 2017)
(a) Highest 75% PM2.5 months in 2017: Min+(Max-min)*0.75%=36+(71-36)*0.75=62ug/m3.
    There are 3 months (so ¼ of the year) in 2017 that is higher than this number. So the number of ‘bad visibility’ days =total days of one month*the rate= 30*1/4=7.5 ≈ 8 days/month
(b) Pre-test results show that people who work in Beijing on average agrees with our current ‘bad visibility’ days

3. Cost
Price=Percentage of GDP loss on average due to air pollution (The World Bank 2007)*China GDP in 2017/China’s population/12 months
2.5%*12237 billion (dollar)*6(exchange rate in 2017)/1.4 billion /12≈100 RMB;
In pre-test, we found people in Beijing are richer than expected, so final cost range=(100,500)

4. Attributes range: according to governmental document, it is reasonable (e.g. improve 15% by the end of 2018)
Appendix 2: Social Capital Questions

- **Social Trust**

  1. Two general social trust questions

    Do you agree or disagree the following statement? (1 is strongly disagree; 2 is slightly disagree; 3 neither agree nor disagree; 4 is slightly agree and 5 is strongly agree)

    (1) Generally speaking, most people in my city can be trusted

    (2) Most people in my city would try to take advantage of me if they got the chance

  2. Two context-specific social trust questions

    Do you agree or disagree the following statement? (1 is strongly disagree; 2 is slightly disagree; 3 neither agree nor disagree; 4 is slightly agree and 5 is strongly agree)

    (1) I trust that other citizens in my city will contribute money to improve the air quality if they have chance

    (2) I trust that other citizens do not want to sacrifice the air quality in my city to gain personal benefits if they have chance
Appendix 2: Social Capital Questions

- **Social Norms**

  1. One general social norm question

     Please tell me the following statement about whether you think they are acceptable in the city you live? (1 is strongly acceptable; 2 is somewhat acceptable; 3 neither acceptable nor unacceptable; 4 is somewhat unacceptable and 5 is strongly unacceptable)

     a) Cheating on taxes if people have a chance

  2. Two context-specific social norm questions

     (1) According to you, what percentage of citizens in your city will contribute their time and (or) money on air quality improvement, although the individual effort is limited to the problem.

     a) Most of them
     b) Some of them
     c) Little of them
Appendix 2: Social Capital Questions

- Social Norms

(2) Please tell me whether you agree or not about the following statements. (1 is strongly disagree; 2 is slightly disagree; 3 neither agree nor disagree; 4 is slightly agree and 5 is strongly agree)

People who are important to me think I should contribute my time and (or) money on air quality, although the individual effort is limited to the problem.

3. One personal norm question

Please tell me whether you agree or not about the following statements. (1 is strongly disagree; 2 is slightly disagree; 3 neither agree nor disagree; 4 is slightly agree and 5 is strongly agree)

People have obligation to use clean energy for central heating (if they are affordable) in winter in my city.
Appendix 2: Social Capital Questions

- Additional social capital question

Social Networks (information)

(1) How often have you heard anyone (friends, relatives or colleagues/classmates) talking about the health and (or) visibility effects of air pollution in China?
   a) Often
   b) Sometimes
   c) Never
   d) I don’t know

(2) Do you think you know enough about air pollution (air pollutants, effect of air pollution and air-pollution related policies) through social media or people surrounding you?
   a) I know quite a lot
   b) I have some of knowledge about it
   c) I know little about it
Appendix: Relevant literature review, results and other resources
Results: Loss aversion

Health attribute

Visibility attribute

Changes in utility

Changes in number of hospital admissions [10 thousands per year]

Changes in utility

Changes in number of bad visibility [days per month]
Results: Hypothesis 2 a & b

Coefficients of social capital indicators (Visibility improvement)

Social Trust

Social Norms

High

Low
Results: Hypothesis 2 a & b

Coefficients of social capital indicators (Visibility deterioration)

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Trust</td>
<td>-0.25</td>
<td>-0.2</td>
</tr>
<tr>
<td>Social Norms</td>
<td>-0.2</td>
<td>-0.15</td>
</tr>
<tr>
<td></td>
<td>Interaction with social trust</td>
<td>Interaction with social norms</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>$H^{imp}\ast SC$</td>
<td>0.410**</td>
<td>fixed</td>
</tr>
<tr>
<td>$V^{imp}\ast SC$</td>
<td>0.077</td>
<td>fixed</td>
</tr>
<tr>
<td>$C^{inc}\ast SC$</td>
<td>0.001***</td>
<td>fixed</td>
</tr>
<tr>
<td>$H^{det}\ast SC$</td>
<td>-0.754***</td>
<td>fixed</td>
</tr>
<tr>
<td>$V^{det}\ast SC$</td>
<td>0.056</td>
<td>fixed</td>
</tr>
<tr>
<td>$C^{dec}\ast SC$</td>
<td>-0.001**</td>
<td>fixed</td>
</tr>
<tr>
<td>BIC</td>
<td>4117</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>2,260</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** SC represent social capital dummy variables of social trust, social norm and social networks respectively, which is high value groups when SC (ST, SN, SI)=1, and represents low value group when SC (ST, SN, SI)=0; (b) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
<table>
<thead>
<tr>
<th></th>
<th>Interaction with social trust</th>
<th>Interaction with social norms</th>
<th>Interaction with social networks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Standard deviation</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Cost</td>
<td>-0.002***</td>
<td>fixed</td>
<td>-0.003***</td>
</tr>
<tr>
<td>Cost</td>
<td>0.000</td>
<td>fixed</td>
<td>0.000</td>
</tr>
<tr>
<td>ASC</td>
<td>-1.321***</td>
<td>1.313***</td>
<td>-1.293***</td>
</tr>
<tr>
<td>Health</td>
<td>0.375**</td>
<td>1.094***</td>
<td>0.233</td>
</tr>
<tr>
<td>Health</td>
<td>-0.607***</td>
<td>1.612***</td>
<td>-0.583***</td>
</tr>
<tr>
<td>Visibility</td>
<td>0.029</td>
<td>0.193***</td>
<td>0.067</td>
</tr>
<tr>
<td>Visibility</td>
<td>-0.202***</td>
<td>0.313***</td>
<td>-0.200***</td>
</tr>
<tr>
<td>BIC</td>
<td>4117</td>
<td></td>
<td>4132</td>
</tr>
<tr>
<td>Observations</td>
<td>2,260</td>
<td></td>
<td>2,260</td>
</tr>
</tbody>
</table>

(a) ASC is alternative specific constant;  
(b) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
## WTP and WTA estimation

<table>
<thead>
<tr>
<th>Variables</th>
<th>Symmetric</th>
<th>Linear Asymmetric</th>
<th>Social Trust</th>
<th>Social norms</th>
<th>Social networks (Information)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Health</td>
<td>1365***</td>
<td>356***</td>
<td>698**</td>
<td>243***</td>
<td>1282**</td>
</tr>
<tr>
<td>Visibility</td>
<td>218***</td>
<td>39**</td>
<td>81</td>
<td>18</td>
<td>88</td>
</tr>
<tr>
<td>Health</td>
<td>1365***</td>
<td>infinity</td>
<td>-968***</td>
<td>infinity</td>
<td>-1029***</td>
</tr>
<tr>
<td>Visibility</td>
<td>218***</td>
<td>infinity</td>
<td>-131**</td>
<td>infinity</td>
<td>-113*</td>
</tr>
<tr>
<td>Observations</td>
<td>6,240</td>
<td>6,240</td>
<td>3,180</td>
<td>3,060</td>
<td>3,210</td>
</tr>
</tbody>
</table>

### Observations

|           | 6,240     | 6,210             | 4,140        | 2,100        |

### Note:

a) **Infinity:** We interpret insignificant WTA as infinitely large amount of money as some of the insignificant WTA in our study is due to the insignificant cost decrease coefficient. A nearly-zero cost decrease (insignificant) in the denominator will lead to an infinitely large WTA.

b) A negative and significant WTA due to negative cost decrease variable implies that individuals are even willing to pay money instead of accepting compensations in order to avoid deteriorating the environment. However, it is ambiguous to draw any conclusion and policy implication for this negative WTA.

c) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
## Latent class model estimation

<table>
<thead>
<tr>
<th></th>
<th>Health-focused Group</th>
<th>Visibility-focused Group</th>
<th>Reformists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>32.6%</td>
<td>31.8%</td>
<td>35.6%</td>
</tr>
<tr>
<td>ASC SQ</td>
<td>-0.530</td>
<td>0.136</td>
<td>-3.251***</td>
</tr>
<tr>
<td>$C^{inc}$</td>
<td>-0.00106**</td>
<td>-0.00318***</td>
<td>-0.000728**</td>
</tr>
<tr>
<td>$C^{dec}$</td>
<td>-0.000903</td>
<td>-0.000350</td>
<td>-0.000295</td>
</tr>
<tr>
<td>$H^{imp}$</td>
<td>1.376***</td>
<td>0.0905</td>
<td>0.157*</td>
</tr>
<tr>
<td>$H^{det}$</td>
<td>-2.532***</td>
<td>-0.201</td>
<td>0.00711</td>
</tr>
<tr>
<td>$V^{imp}$</td>
<td>0.0606</td>
<td>0.225***</td>
<td>-0.0226</td>
</tr>
<tr>
<td>$V^{det}$</td>
<td>-0.246***</td>
<td>-0.168***</td>
<td>-0.0590</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-1987</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Literature Review: Loss Aversion

❖ Literature Contribution: Gain-loss asymmetry (or loss aversion: Kahneman, 1979)
  ❖ Inconsistent results:
    • Loss aversion: Yes: (Lanz et al., 2010---flood management; Glenk et al., 2011; Ahtiainen et al., 2015---water quality management); No: Aravena et al (2014)

❖ Drawbacks of experimental design:
  • Lanz et al. (2010): Unbalanced number of attribute levels in the gain and loss domains: lead to loss aversion manipulation bias (Walasek and Stewart, 2015)

➢ Contribution: Our design allows us to investigate gain-loss asymmetry behaviour with balanced number of levels in the gain and the loss domain.
Literature Review: The effects of Social Capital on Environmental Preference

❖ Literature Contribution

❖ Effects of Social capital on welfare estimates

  • A few studies investigate this effect using contingent valuation method, with inconsistent results (see appendix 2 for details)

  • Very limited studies used DCE

  • No study investigates the effects of social capital on welfare losses when the environment deterioration occurs

❖ Contribution:

  • First study to examine the effects of social capital on preference for both environmental improvement and environmental deterioration

  • Another paper that uses DCE instead of CVM to detect the effects of social capital on WTP
<table>
<thead>
<tr>
<th></th>
<th>Social trust</th>
<th>Social norms</th>
<th>Social networks (civic participation)</th>
<th>Institutional trust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones et al. (2009)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Jones et al. (2010)</td>
<td>+</td>
<td>no</td>
<td>no</td>
<td>+</td>
</tr>
<tr>
<td>Jones et al. (2015)</td>
<td>+</td>
<td>-</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Polyzou et al. (2011)</td>
<td>no</td>
<td>+</td>
<td>no</td>
<td>+</td>
</tr>
<tr>
<td>Halkos et al. (2012)</td>
<td>+</td>
<td>+</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Marbua (2016)</td>
<td>no</td>
<td>no</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Literature: the effects of Social Capital Indicators on WTP
Mechanism of Social capital effects on Willingness to Pay

- Social capital on Willingness to Pay (WTP)
  - Typical indicators representing social capital values and effects on WTP
    - Social Trust → expect others act in similar ways → WTP (Zhang et al. 2006; Jones, 2009; Polyzou et al. 2011)
    - Social Norm → comply social norms → collective actions → WTP (Jones, 2009; Polyzou et al. 2011; Halkos et al. 2012)
    - Social Networks (information) → environmental awareness → WTP (Wakefield, et al. 2006; Jones, et al. 2015)
Chinese government relaxed next air pollution control targets

Current PM2.5 levels and targets in some Chinese cities

Data Source: https://indiaclimatedialogue.net/2018/07/10/china-releases-2020-action-plan-for-air-pollution/
Discussion

❖ **Non-significant loss aversion for the visibility effect**
  - Respondents see health effect of air pollution as more important than visibility effect and pay more attentions on the health effect (Diener, 1997).

❖ **Insignificant cost decrease variable**
  - Implication: Respondents not consider monetary compensations as part of their trade-offs when environment is framed as a deterioration
  - Results from posterior analysis: ‘attribute non-attendance’ and ‘not able to accept air quality deterioration’ are two potential reasons
  - Results from latent class after excluding those people: there is a ‘money-focused’ class in which people pay attention to the cost increase as well as cost decrease variable.
  - Implication of results
    - (a) moral outrage plays a role in environmental valuation (Stevens et al. 1991; Whynes and Sach, 2007).
    - (b) Taboo trade-off
Links of media articles

**Banning coal use**
https://www.ft.com/content/f48c9674-ae68-11e7-beba-5521c713abf4

**Stringent policies may harm economic growth**


Sources of Electricity Generation in China

Data Source: World Energy Outlook, 2017
<table>
<thead>
<tr>
<th></th>
<th>措施 A</th>
<th>措施 B</th>
<th>维持目前措施</th>
</tr>
</thead>
<tbody>
<tr>
<td>健康效应（年急诊人数）</td>
<td>每年 14.5 万急诊人数</td>
<td>每年 12 万急诊人数</td>
<td>每年 13 万急诊人数（不变）</td>
</tr>
<tr>
<td></td>
<td>增加 1.5 万，或 11%</td>
<td>减少 1 万，或 7.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image1.png" alt="图标1" /></td>
<td><img src="image2.png" alt="图标2" /></td>
<td><img src="image3.png" alt="图标3" /></td>
</tr>
<tr>
<td>能见度效应（每月“能见度较差”的天数）</td>
<td>每月有 12 天能见度较差（增加 4 天）</td>
<td>每月有 4 天能见度较差（减少 4 天）</td>
<td>每月有 8 天能见度较差（不变）</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>家庭电费，燃气和供暖费变化</td>
<td>费用减少 100 元/月（费用减少 1200 元/年）</td>
<td>费用增加 100 元/月（费用增加 1200 元/年）</td>
<td>费用无变化</td>
</tr>
</tbody>
</table>
Motivation 3: Heterogeneous effect of social capital on loss aversion

- Loss aversion is reduced when individuals make decisions for others rather than themselves (Polman, 2012; Mengarelli et al., 2014; Zhang et al., 2017)
- Explanation: increasing social distance creates less emotional attachment to others (Sokol-Hessner et al., 2013; Campos-Vazquez and Cuilty, 2014)
- Social distance is strongly correlated to various indicators of social capital
- Expectation: Social capital is negatively correlated to loss aversion

Social Capital → Social distance → Loss aversion

- Lower social capital—higher social distance—more self emotional attachment—more loss aversion
- Assumption: loss aversion preferences for the private goods are much higher than the one for the public goods (supported by empirical literature).

- The first study to examine the effect of social capital on individuals’ loss aversion preference for the environmental goods.