Subjective Relative Income Positions and the Priming Effect of Endpoint Anchors

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Lebensstandard
Onlinerechner: Wie arm oder reich sind Sie im Österreich-Vergleich?

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Genau in der Mitte 50% 50% - ich habs geschafft

Omg 75% sind reicher als ich?

Is ma wurscht....

Woher soll ich wissen, wieviel meine Frau verdient?

The black box of perceptions
The black box of perceptions

- Is the way information is retrieved relevant for resulting preferences?
- How are perceptions formed?
Why is this question relevant?

- A) Issues related to limited information (e.g. segregation) cannot explain the variety of perception differences (Page and Goldstein 2016) → other mechanisms must be involved

- B) Different questions lead to different estimates of respondents regarding their perceived income distribution (Eriksson and Simpson 2012) → current methods to elicit relative positions might be biased

- C) Simple Bayesian updating cannot explain the changes in preferences when information is made available (Trump 2018) → information is not processed in a net-maximizing way
Perceptions in sociology

• Post truth debate

• People’s perceptions about inequality in society can explain preferences for redistribution better than objective measures (Bobzien forthcoming; Cruces, Perez-Truglia, and Tetaz 2013; Gimpelson and Treisman 2018; Karadja, Mollerstrom, and Seim 2016)

• People may not differ in their values (ideal/fair/good) but in their perceptions

• Weak tradition to measure detailed beliefs about the present:
  ◦ Beliefs are measured by general statements
    – „by and large, people deserve what they get“ (Furnham 2003; Rubin and Peplau 1975)

• Strong mixture between how one sees and how one should see the world (Davidai and Gilovich 2015) (early critics Wegener 1990; Manski 2004)
Lebensstandard
Onlinerechner: Wie arm oder reich sind Sie im Österreich-Vergleich?

Relative positions

• *Relative* material payoffs affect people’s well-being and behavior in addition to its absolute value (Fehr and Schmidt 1999)

• One’s relative position is the prime explanatory factor for life satisfaction (Easterlin, 1974; McBride, 2001; Blanchflower and Oswald, 2004; Stutzer, 2004; Ferrer-i-Carbonell, 2005; Luttmer, 2005; Weinzerl, 2006)

• People have problems estimating their relative position and the related distributions (Chambers, Swan, and Heesacker 2014; Kiatponsan & Norton, 2014; Norton & Ariely, 2011)
Lebensstandard
Onlinerechner: Wie arm oder reich sind Sie im Österreich-Vergleich?

Relative positions as directed comparisons

- Social comparison is a tool in the quest for self-knowledge (Ferstinger 1954).

- People’s inferences differ if confronted with information about upwards (higher) or downwards (lower) comparisons (Skylark et al. 2018).

- Terms like “more than” imply that dominant actors have more than the standard, while terms like “less than” imply that the subordinate actors have less than the standard.
  - Downwards comparison should increase fairness concerns about the poor (having too little) while upwards comparisons should increase fairness concerns about the rich (having too much).

<table>
<thead>
<tr>
<th></th>
<th>equality</th>
<th>need</th>
<th>equity</th>
<th>entitlement</th>
<th>inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor higher</td>
<td>+</td>
<td>–</td>
<td>0/-</td>
<td>–</td>
<td>0/-</td>
</tr>
<tr>
<td>(Ref.: lower)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study 1: Method and Data

• Sample: PUMA survey VI, representative sample of the Austrian population, N= 1088
• Approach: Randomly varied relative income question anchor

There are 6.8 million income earners in Austria. Which part of them you guess has a lower/higher yearly gross income than you?

• We will display the relative share of people below one’s position by subtracting the higher answers from 100.

• Data sources (for calculation of actual relative positions):
  ◦ WE NEED MORE/BETTER DATA!
**Study 1: Results**

- Higher anchors induce upwards bias compared to lower anchors
  - \( (M_h = 56.7, M_l = 47.3, \Delta M=9.4, t = -6.5, df = 1009, \text{p-value} = 0.000) \)
- The bias is unrelated to actual income position
- The bias is unrelated to the bias towards the middle
Study 1: Results

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- The bias is unrelated to actual income position
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• The bias is unrelated to actual income position

• The bias is unrelated to the bias towards the middle
Is the way information is retrieved relevant for resulting evaluations?

<table>
<thead>
<tr>
<th></th>
<th>equality</th>
<th>need</th>
<th>equity</th>
<th>entitlement</th>
<th>inequality</th>
<th>SSS</th>
<th>Future SSS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
<tr>
<td>D=(Total Effect)</td>
<td>0.225</td>
<td>0.039</td>
<td>-0.229*</td>
<td>0.071</td>
<td>-0.055</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A = IV→M</td>
<td>12.21***</td>
<td></td>
<td>12.21***</td>
<td>12.21***</td>
<td>12.21***</td>
<td>12.21***</td>
<td></td>
</tr>
<tr>
<td>B=M→DV</td>
<td>-0.01**</td>
<td>0.001</td>
<td>0.002</td>
<td>0.0068</td>
<td>0.0018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A*B (ACME)</td>
<td>-0.124*</td>
<td>0.0148</td>
<td>0.019</td>
<td>0.0828*</td>
<td>0.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV→DV(control M) =ADE</td>
<td>0.358*</td>
<td>0.0258</td>
<td>-0.255*</td>
<td>-0.013</td>
<td>-0.082</td>
<td>-0.142</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Evidence f. mediation (indirect e.)
- ✓
- X

Evidence f. direct effect
- ✓
- X

Bootstrapped, unstandardized effects. P<0.001***, p<0.01**, p<0.05*, p<0.1+
N=246

- Mixed results regarding direct effects of direction of comparison
- Strong evidence that the anchor affects other variables through its effect on the evaluation of one’s position in the income hierarchy → e.g. subjective social status (SSS)
How are perceptions formed?
Understanding relative self-positioning as social comparison.
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Understanding relative self-positioning as social comparison.

- Motivational perspective (MP)
  - Egoism → the social value of the evaluated trait drives the bias (BTAE & goal to think well of oneself (motivated avoidance) (Brown 2012; Guenther and Alicke 2010)
How are perceptions formed?
Understanding relative self-positioning as social comparison.

- Motivational perspective (MP)
  - Egoism $\rightarrow$ the social value of the evaluated trait drives the bias (BTAE & goal to think well of oneself (motivated avoidance) (Brown 2012; Guenther and Alicke 2010)

- Cognitive perspective (CP)
  - Enhanced accessibility $\rightarrow$ easier time recruiting evidence in line with targets (non-motivational avoidance) (Epley and Gilovich 2016; Mussweiler and Strack 1999)
Study 2: Testing the mechanisms
# Study 2: Testing the mechanisms

<table>
<thead>
<tr>
<th>Test approaches</th>
<th>Motivational P.</th>
<th>Cognitive P.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reversing the social value of the evaluated trait (e.g. flight behavior)</td>
<td>Reverse bias</td>
<td>No effect</td>
</tr>
<tr>
<td>Measuring bias of respondents that value the underlying trait highly</td>
<td>Increase (reversed) bias</td>
<td>No effect</td>
</tr>
<tr>
<td>Treating motivational reaction (increasing value concerns by design)</td>
<td>Increase reversed bias</td>
<td>No effect / reduced bias</td>
</tr>
<tr>
<td>Measuring perceptions without comparing to the self (e.g. relative position of a neutral point)</td>
<td>Reduce bias</td>
<td>No effect / increase bias</td>
</tr>
</tbody>
</table>
Study 2: Method and Data

- Sample: 282 students (158 undergraduate, 124 graduate)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Between Variation</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative income position</td>
<td>Lower</td>
<td>Lower first double</td>
<td>Higher first double</td>
<td>Higher</td>
<td></td>
</tr>
<tr>
<td>Median income position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. flight behavior km/CO2(^1)</td>
<td>Lower</td>
<td>Lower</td>
<td></td>
<td>Higher</td>
<td>Higher</td>
</tr>
<tr>
<td>R. wealth position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample</td>
<td>1/3</td>
<td>1/6</td>
<td>1/6</td>
<td>1/3</td>
<td></td>
</tr>
</tbody>
</table>

Note: \(^1\)Question wording (carbon dioxide emission and flight kilometers) varied randomly between subjects.
Consistency checks

• T2 and T3
  ◦ participants’ estimates about the share of people above and below their relative position should add up to 100 (or 99)
  ◦ Of the 78 participants who answered this question 17 failed to do so (22%)

• T1 and T4
  ◦ if a participant earns 2000 Euros and estimates the share of people earning less than herself to be 50% and afterwards assesses the share of people earning less than 1650 Euros (the median income) and provides the answer 40%, the answers are logically inconsistent
  ◦ Of 150 respondents 24 provided inconsistent answers of this kind (16%)

• Estimating relative positions is cognitively demanding
Results: Replication of biases with income and wealth

\[ \text{M}_l = 23.10, \text{M}_h = 33.03, t = 3.01, \text{df} = 143.2, \text{p-value} = 0.003 \]

\[ \text{M}_l = 38.89, \text{M}_h = 53.45, t = 4.44, \text{df} = 224.7, \text{p-value} = 0.000 \]
Reversing the scale

(M₁ = 46.64, M₂ = 54.40, t = 2.28, df = 227.7, p-value = 0.023)
Interactions of anchors and respondent’s values

- Expected positive interaction between higher anchor and valuing the underlying trait highly

<table>
<thead>
<tr>
<th></th>
<th>Subj. relative income pos.</th>
<th>Subj. relative wealth pos.</th>
<th>Subj. relative flight b. pos.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Anchor higher</td>
<td>8.908**</td>
<td>20.774*</td>
<td>12.549***</td>
</tr>
<tr>
<td>(Ref. lower)</td>
<td>(2.999)</td>
<td>(8.740)</td>
<td>(2.844)</td>
</tr>
<tr>
<td>Value earning</td>
<td>1.401</td>
<td>3.342</td>
<td>8.161**</td>
</tr>
<tr>
<td></td>
<td>(1.580)</td>
<td>(2.070)</td>
<td>(2.962)</td>
</tr>
<tr>
<td>Anchor * Value earning</td>
<td></td>
<td></td>
<td>-4.693</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(3.249)</td>
</tr>
<tr>
<td>Value rich</td>
<td>0.794</td>
<td>2.932+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.136)</td>
<td>(1.573)</td>
<td></td>
</tr>
<tr>
<td>Anchor * Value rich</td>
<td></td>
<td></td>
<td>-4.389+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2.249)</td>
</tr>
<tr>
<td>Pollution danger</td>
<td></td>
<td></td>
<td>-3.161*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1.579)</td>
</tr>
<tr>
<td>Anchor * Pollution danger</td>
<td></td>
<td></td>
<td>-1.465</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(3.187)</td>
</tr>
</tbody>
</table>

Observations: 145 145 225 225 222 222
R²: 0.267 0.278 0.330 0.341 0.298 0.299
Adjusted R²: 0.252 0.258 0.321 0.329 0.289 0.286

Note: *p<0.1, **p<0.05, ***p<0.01
Treating motivational reactions

![Graph showing the relationship between Actual relative flying behaviour and Perceived relative flying behaviour.]

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Actual relative flight position</td>
<td>0.432***</td>
<td>(0.048)</td>
</tr>
<tr>
<td></td>
<td>Anchor: higher (Ref: lower)</td>
<td>8.402*</td>
<td>(4.097)</td>
</tr>
<tr>
<td></td>
<td>Question wording: hours (Ref: CO2)</td>
<td>1.382</td>
<td>(4.078)</td>
</tr>
<tr>
<td></td>
<td>Anchor * Question wording</td>
<td>-2.149</td>
<td>(5.860)</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>16.269***</td>
<td>(4.385)</td>
</tr>
</tbody>
</table>

Observations: 229
R²: 0.283
Adjusted R²: 0.271

Note: *p<0.05, **p<0.01, ***p<0.001
Testing the cognitive mechanism

• Bias without a cause
  ◦ Does the bias exist if we ask about higher/lower position of the median income?
  ◦ \( (M_l = 34.7, M_h = 52.5, t = 8.34, df = 258, p\text{-value} = 0.000) \)

• Successful debiasing through double anchoring?
  ◦ \( (M_l = 27.3, M_h = 36.0, t = 1.4, df = 58, p\text{-value} = 0.16) \)
  ◦ Difference is not sig. anymore but low sample size
  ◦ we cannot say that the difference (8.7) is smaller compared to the estimates with a single anchor (9.9)
  ◦ It seems that the ordering effect (first anchor decides bias) outweighs the debiasing effect
Conclusion and Discussion

• Studies using single anchor question systematically bias the proportion of respondents over- or underestimating their relative (income) position

• These directional biases are present in a wide variety of topics

• Results suggest that motivational mechanisms are not the prime driver for biases

• A cognitive anchoring perspective might be best suited to understand relative self-perceptions

• Media discussions highlighting either top- or bottom anchors may change how people estimate their own position in society

• Limitations
  ◦ Motivational norms might be more important if norms are directly violated
    – E.g. underreporting of female and overreporting of male income around the 50% threshold (Roth and Slotwinski 2019)
  ◦ Satisficing might increase biases in surveys. This would suggest lower biases in contexts outside of surveys → next step: natural experiments
The dangers of a one sided story

It's all about perception

https://me.me/i/the-dangers-of-a-one-sided-story-67b82002e42e4192bc73c11113b74bd9
Full German question wording of the relative income question

Stellen Sie sich vor, Sie bekommen Ihr derzeitiges Einkommen 14-mal im Jahr ausbezahlt.

Welcher Anteil der rund 6,9 Millionen Einkommensbeziehenden\(^1\) in Österreich schätzen Sie, hat dann ein höheres Brutto-Jahresein kommen\(^2\) als Sie?

\(^1\)In dieser Gruppe sind unselbständige Vollzeit- oder Teilzeit-Erwerbstätige, Lehrlinge sowie Pensionisten und Pensionistinnen enthalten. Auch Personen, die nicht das gesamte Jahr über Einkommen bezogen haben, sind inkludiert.


Tragen Sie hier den geschätzten Anteil ein:  

\(\%\)
Cognitive Effort and Bias

- Literature suggest easier times to answer questions with an upwards anchor (Skylark et al. 2018)
- We do not find a significant difference between the answer times of high and low questions in Study 1:
  - $M_L 65.4, M_H 64.3, t = 0.27, p = 0.78$
- Study 2:
  - Income: $M_L 48.7, M_H 44.7, t=0.825, p=0.41$
  - Median: $M_L 31.79, M_H 32.63, t=0.245, p=0.81$
  - Flying: $M_L 30.7, M_H 27.31, t=0.65, p=0.52$
  - Wealth: $M_L 20.36, M_H 19.6, t=0.52, p=0.60$

Answer error, time and bias remain quite stable
Robustness of difference (study 1)

Are resp. getting more sophisticated if their own positions reaches an anchor point? -> unclear but most likely not.

Estimating means rounding up or down.
<table>
<thead>
<tr>
<th>Subjective relative income Position</th>
<th>LOW ANCHOR</th>
<th>HICH ANCHOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual income percentile</td>
<td>0.528***</td>
<td>0.572***</td>
</tr>
<tr>
<td></td>
<td>(0.039)</td>
<td>(0.042)</td>
</tr>
<tr>
<td>Female (Ref::male)</td>
<td>0.080</td>
<td>-2.669</td>
</tr>
<tr>
<td></td>
<td>(1.591)</td>
<td>(1.671)</td>
</tr>
<tr>
<td>Age</td>
<td>-0.017</td>
<td>-0.060</td>
</tr>
<tr>
<td></td>
<td>(0.070)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>Vocational training (Ref. Primary Educ.)</td>
<td>-5.212*</td>
<td>-3.856*</td>
</tr>
<tr>
<td></td>
<td>(2.496)</td>
<td>(2.085)</td>
</tr>
<tr>
<td>Secondary</td>
<td>-1.775</td>
<td>-4.487*</td>
</tr>
<tr>
<td></td>
<td>(2.718)</td>
<td>(2.449)</td>
</tr>
<tr>
<td>University</td>
<td>3.645</td>
<td>-0.529</td>
</tr>
<tr>
<td></td>
<td>(2.953)</td>
<td>(3.075)</td>
</tr>
<tr>
<td>in education (Ref::employed)</td>
<td>-9.266**</td>
<td>-7.236*</td>
</tr>
<tr>
<td></td>
<td>(3.513)</td>
<td>(3.942)</td>
</tr>
<tr>
<td>retired</td>
<td>4.128</td>
<td>-1.864</td>
</tr>
<tr>
<td></td>
<td>(2.511)</td>
<td>(2.620)</td>
</tr>
<tr>
<td>unemployed</td>
<td>-1.047</td>
<td>-4.209</td>
</tr>
<tr>
<td></td>
<td>(4.081)</td>
<td>(3.636)</td>
</tr>
<tr>
<td>Constant</td>
<td>16.502***</td>
<td>30.366***</td>
</tr>
<tr>
<td></td>
<td>(4.564)</td>
<td>(4.323)</td>
</tr>
</tbody>
</table>

Observations                       | 500         | 498          |
R²                                 | 0.464       | 0.429        |
Adjusted R²                        | 0.454       | 0.418        |

Note: *p**p***p<0.01

- Assumption of treatment equality
- Effects of sociodemographic variables remain quite stable between groups high and low
- This is especially the case for the objective income
Why a student sample might be alright in this context

• Our treatment is allocated randomly
• We show in the representative sample that the anchor effect is independent of education background age and income.
• We have a student sample that is not self-selected (students were drawn from obligatory courses)
• We do not try to evaluate the size of the effect, but test for the existence of specific mechanisms explaining the biases
## Question wording of controls etc.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Item</th>
<th>Answer-Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inequality</td>
<td>The social inequality in Austria is too large</td>
<td>7-point rating scale</td>
</tr>
<tr>
<td>Subjective social position (present)</td>
<td>There are people who tend to be towards the top of our society and people who tend to be towards the bottom. On this card there is a scale that runs from top to bottom. Where would you place yourself on this scale nowadays?</td>
<td>10 point scale with endpoint labeling 1=top, 10 = bottom.</td>
</tr>
<tr>
<td>Subjective social position (future)</td>
<td>There are people who tend to be towards the top of our society and people who tend to be towards the bottom. On this card there is a scale that runs from top to bottom. Where would you place yourself on this scale nowadays?</td>
<td>10 point scale with endpoint labeling 1=top, 10 = bottom.</td>
</tr>
<tr>
<td>Distributive principle: equality</td>
<td>A society is just if income and wealth are equally distributed among the citizens.</td>
<td>5-point rating scale</td>
</tr>
<tr>
<td>Distributive principle: equity</td>
<td>A society is just if hard-working people earn more than others.</td>
<td>5-point rating scale</td>
</tr>
<tr>
<td>Distributive principle: need</td>
<td>A society is just if it takes care of those who are poor and needy.</td>
<td>5-point rating scale</td>
</tr>
<tr>
<td>Distributive principle: entitlement</td>
<td>A society is just if citizens with higher status have better living conditions than those with lower status.</td>
<td>5-point rating scale</td>
</tr>
</tbody>
</table>
Summary

Problem:
• People’s perceptions about their position in society are crucial for many beliefs and preferences
• However, individual perceptions tend to be inaccurate and systematically biased

Idea:
• Perceptions about one’s relative positions in society are best understood as social comparisons

Explanations:
• The motivational explanation:
  ◦ Perceptions are biased because of the tendency to enhance one’s position compared to the target
• The cognitive explanation:
  ◦ Perceptions are biased because of easier recollection of memories in line with target of comparison

Test strategy in the context of direction of comparison -> 2 stages:
• Study 1: Survey experiment on a representative sample of Austrians shows bias and relates it to fairness attitudes
• Study 2: Survey experiment on a student sample tests the 2 proposed mechanisms directly