The effect of attribute framing on consumers’ attitudes and intentions toward food: A Meta-analysis

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Attribute framing and food choices

- Attribute framing refers to presenting food attributes in terms of gains and losses as often done in food marketing.

Effect of attribute framing on consumers’ attitudes and intention
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Introduction: Framing effects and attribute framing

- The framing effect shows that decisions depend on the way in which outcomes are presented.
- Gains are valued different from losses.

Example (Kahneman & Tversky, 1981):

Outbreak of a disease which is expected to kill 600.

- **Program A:** 200 people will be saved (72%)
- **Program B:** P=1/3 - 600 are saved; P=2/3 - nobody will be saved.
- **Program C:** 400 people will die
- **Program D:** P=1/3 - nobody will die, P=2/3 - 600 will die. (78%)

Preferences for certain outcomes when presentation in terms of gains

Preference for uncertain outcome when presentation in terms of losses
Introduction: Attribute framing

- Framings of outcomes, context and goals matters for decision making
- Here: Attribute framing → describing the way that product attributes are communicated
- In food marketing attribute framing comes in different forms:
  - High versus low
  - Same meat
  - High tech

Dichotomous presentation of a product attribute often via labels
Objectives

1. Systematic review of the use of gain-loss attribute framing on food products

2. Meta-analysis identifying effects of framing on
   • consumer attitudes
   • consumer intentions
Method

- Identification of articles in peer-reviewed journals and conference proceedings via ScienceDirect, Web of Science, EBSCO host, & AgEcon Search
- Additional search on Google Scholar
- 25 articles published between 1987 and May 2021
Method

25 studies with attribute framing on
  • health (nutrition and food safety)
  • sustainability (environmental benefits, animal welfare, organic & ethnic food)

Sample size varies between 25 and 433
  • 32 % of the studies in the USA
  • 13 % used product labels
  • 30 % were done online

76 outcome measures
  • 40 measures “attitudes”
  • 36 measures “intentions”

\[
Mean_i = \beta_0 + \beta_1 \text{Frame}_i + \beta_2 \text{USA}_i + \beta_3 \text{Outcome}_i + \beta_4 \text{Interaction}_i + \beta_5 \text{Product}_i + \beta_6 \text{Label}_i + \beta_7 \text{Student}_i + \beta_8 \text{Online}_i + u_i + \epsilon_i
\]
Sample of studies (n = 25)
## Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Mean (standard deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Whole sample N=76</td>
</tr>
<tr>
<td>DV</td>
<td>7-point likert scale</td>
<td>4.40 (0.86)</td>
</tr>
<tr>
<td>Frame</td>
<td>1 - gain frame, 0 - loss frame</td>
<td>0.50 (0.50)</td>
</tr>
<tr>
<td>USA</td>
<td>1 - if the study is conducted in the USA</td>
<td>0.32 (0.47)</td>
</tr>
<tr>
<td>Outcome</td>
<td>1 - attitude</td>
<td>0.53 (0.50)</td>
</tr>
<tr>
<td>Interaction</td>
<td>1 - interaction term</td>
<td>0.51 (0.50)</td>
</tr>
<tr>
<td>Product</td>
<td>1 - specific product</td>
<td>0.53 (0.50)</td>
</tr>
<tr>
<td>Label</td>
<td>1 - label is used</td>
<td>0.13 (0.34)</td>
</tr>
<tr>
<td>Student</td>
<td>1 - student sample</td>
<td>0.50 (0.50)</td>
</tr>
<tr>
<td>Online</td>
<td>1 - online study</td>
<td>0.30 (0.46)</td>
</tr>
</tbody>
</table>

Effect of attribute framing on consumers' attitudes and intention
Results

• Forest plot from meta analysis ("metan" stata 13)
• Overall a positive effect

→ The gain frame results in higher attitudes and intentions than the loss frame

• High heterogeneity in the studies
Subgroup analysis for attitude (left) and intentions (right)

Effect of attribute framing on consumers' attitudes and intention
Meta-regression results

- Analysis by full sample and by dependent measure
- A gain frame, use of interaction terms, a specific product and a student sample show an impact on DV.
- The effects can be different depending on the outcome measure. E.g., for US samples have a positive impact on Intention, but not attitude.
- A specific products leads to lower attitudes.
- The framing effect is not present in studies focusing on intentions rather than attitude.

<table>
<thead>
<tr>
<th>Effect of attribute framing on consumers' attitudes and intention</th>
<th>Whole sample N=76</th>
<th>Attitude N=40</th>
<th>Intention N=36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>0.27 (0.13)**</td>
<td>0.51 (0.09)***</td>
<td>-0.01 (0.09)</td>
</tr>
<tr>
<td>USA</td>
<td>0.10 (0.20)</td>
<td>-0.74 (0.20)***</td>
<td>1.01 (0.34)***</td>
</tr>
<tr>
<td>Interaction</td>
<td>0.30 (0.14)**</td>
<td>-0.18 (0.14)</td>
<td>0.33 (0.14)**</td>
</tr>
<tr>
<td>Product</td>
<td>-0.32 (0.18)*</td>
<td>-0.93 (0.46)*</td>
<td>-0.09 (0.44)</td>
</tr>
<tr>
<td>Label</td>
<td>0.30 (0.20)</td>
<td>0.59 (0.12)***</td>
<td>---</td>
</tr>
<tr>
<td>Student</td>
<td>-0.57 (0.31)*</td>
<td>-0.02 (0.45)</td>
<td>-0.71 (0.55)</td>
</tr>
<tr>
<td>Online</td>
<td>0.28 (0.29)</td>
<td>0.83 (0.51)</td>
<td>0.88 (0.49)*</td>
</tr>
<tr>
<td>Intercept</td>
<td>4.60 (0.30)***</td>
<td>5.27 (0.41)***</td>
<td>4.14 (0.51)***</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>72.32%</td>
<td>100.00%</td>
<td>98.74%</td>
</tr>
<tr>
<td>$\tau^2$</td>
<td>0.07</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>$I^2$</td>
<td>17.84%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Conclusion

- Overall, framing effect is detected leading to a positive effect of gain framing on attitudes and intentions (whole sample), but when split by outcome only for attitudes.
- Interaction effects and setting of studies play an important role.
- Expression is stronger for product categories than for specific products.
- Effects are more readily observed when labels are used for communication.
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Thank you!