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How to Improve Decision Making in Small Groups:
Dissent, Preference-consistency and unshared information

The First Annual INGRoup Conference in Pittsburgh, PA, July 27-29, 2006
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1. Defective processes in small group decision making
2. Interventions against these processes
3. Evaluation of two interventions in a laboratory group experiment
4. Experimental effects on process variables and decision quality
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• ... is especially useful in hidden profile situations which are characterized by two conditions:
  1. each group member has relevant unshared (i.e. unique) information
  2. optimal decision only by integrating these unshared information
• However, groups seldom outperform a simple aggregation of members’ initial preferences (e.g. Stasser & Titus, 1985).
• Two defective processes responsible
  1. Neglection of unshared information
  2. Preference-consistent processing
1. Neglection of Unshared Information

- *Common knowledge effect*: Higher impact of shared (compared to unshared) information on group decisions (Gigone & Hastie, 1993, 1997; Stasser & Titus, 1985). **Reasons:**


   - *Social validation* (Greitemeyer & Schulz-Hardt, 2003)
   - *Ownership Bias* (Van Swol, Savadori & Sniezek, 2003)
2. Preference-consistent Processing

- Early expression of individual preferences and negotiation about these preferences instead of information (Gigone & Hastie, 1993; Mojzisch and Schulz-Hardt, 2005).

- Preference-consistent information exchange (Dennis, 1996; Wittenbaum, Bowman, & Hollingshead, 2003)

- Preference-consistent evaluation (relevance and credibility) of information (Greitemeyer & Schulz-Hardt, 2003)
How to Improve Decision Making in Small Groups?

- Authentic dissent improves group decision making, mediated by more intense and less biased information exchange (Brodbeck, Kerschreiter, Mojzisch, Frey, & Schulz-Hardt, 2002; Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter & Frey, in press)

- But what if there is consent in a decision making group?

- Instructing group members to reduce defective decision processes yielded inconclusive results with regard to decision quality (Larson, Christensen, Franz, & Abbott, 1998; Larson, Foster-Fishman, and Keys, 1994; Mennecke, 1997; Stasser et al., 1989)

Aims of the present study

- Enrich instructions with a group exercise to demonstrate defective processes

- Also demonstrate individuel-level processes and not only group-level processes
## Two Interventions in this Experiment

<table>
<thead>
<tr>
<th>Procedure ↓</th>
<th>1. Information use</th>
<th>2. Preference consistency</th>
</tr>
</thead>
</table>
| Jigsaw puzzle in the group | Everybody has shared and unshared pieces  
Relevance of unshared pieces gets obvious | 1. *Indiv.* puzzle of picture with same shape but differ. colours  
2. *Group* puzzle: Goal „all one colour picture“ is only attainable with a *new* colour |
| Clarification of the analogy | Pieces = information in group decision | individ. successful colour = initial preference in a group decision |
| Decision example: Dest. for vacation | Some infos shared, others unshared | Everybody has preference for specific destination |
| Clarification of defective processes | Reasons for neglection unshared information | Consequences of initial preferences for group decisions |
| Request | ... to focus on introducing *new* information | ... not to introduce preferences but information in an unbiased way |
Model of the Effects of the Interventions

**Input**

- Information intervention
- Dissent
- Preference intervention

**Process**

- Systematic processing
  - Information exchange
  - Information elaboration
- Sharedness bias
  - Information exchange
  - Information evaluation
- Preference bias
  - Preference negotiation
  - Information exchange
  - Information evaluation

**Output**

- Decision quality

**Positive effect**

- Information
- Systematic processing
- Sharedness bias
- Preference bias

**Negative effect**

- Dissent
- Preference intervention
Research Design and Sample

<table>
<thead>
<tr>
<th>Control condition</th>
<th>Information Interv.</th>
<th>Preference Interv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent</td>
<td>5 Groups</td>
<td>5 Groups</td>
</tr>
<tr>
<td>Dissent</td>
<td>5 Groups</td>
<td>5 Groups</td>
</tr>
</tbody>
</table>

- Control condition: Same jigsaw puzzle introduced as “training in group problem-solving” and jointly performed; no subsequent clarifications; everybody had access to all pieces
- Group members knew each other in advance
- 93 % students of different subjects, 41 % psychology
- Age: $M = 24.0$ years, $SD = 2.8$ years
- 49 % female, 51 % male
Group Task

- Hidden-profile task: selecting a pilot for long-distance flights (adapted from Kerschreiter, Mojzisch, Schulz-Hardt, Brodbeck & Frey, 2002)

- 40 pieces of information (shared and unshared) described the four candidates and were distributed over the three group members.

- Best (=correct) candidate could only be identified when all information were simultaneously considered.

1. 20 minutes for individual evaluation of candidates and to memorize information

2. 30 minutes maximum for group decision (paper and pencil available)
Manipulation of Dissent

- Manipulation of group members' initial preferences by the information distribution:
  1. **Consent**: All three members prefer same suboptimal candidate.
  2. **Dissent**: All three members prefer different suboptimal candidates.

- Preference induction successful for 88% of participants
- In the dissent condition, much more disagreement was perceived than in the consent condition ($\eta^2 = .65$, $p < .001$).
Possible Covariates

• 9% of participants initially preferred the correct candidate ⇒ relative initial preference for correct candidate as covariate

• Other covariates were included in analyses in case of medium effects on dependent variable:
  • Age
  • Grade of university entrance exam (Abitur)
  • Proportion of female group members
  • Proportion of undergraduate psychology members
  • Expected quality of teamwork
Systematic processing: Measures

Group level

• Amount of information introduced in the discussion (unadjusted intraclass-correlation = ICC_u = .85)

Individual level

• Amount of information recalled after discussion (ICC_u = .99)
Experimental Results: Information Introduced

As expected, both interventions enhanced amount of information introduced into discussion.

\[
\begin{array}{c|c|c|c|c|}
\text{Intervention} & Eta^2 \\
\hline
\text{Dissent vs. consent} & 0.01 \\
\text{Intervention} & 0.38 \\
\text{Dissent x intervention} & 0.07 \\
\hline
\end{array}
\]

*** p < .05
Experimental Results: Information Recalled

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Information recalled (z-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>-0.5</td>
</tr>
<tr>
<td>Info</td>
<td>1.5</td>
</tr>
<tr>
<td>Pref</td>
<td>0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissent vs. consent</td>
<td>0.04</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.03</td>
</tr>
<tr>
<td>Dissent x intervention</td>
<td>0.16</td>
</tr>
</tbody>
</table>

No significant effect (all $p$'s $> 0.15$)
Sharedness Bias: Measures

- **Actual sharedness bias** as a combination of
  1. Repetition bias in favor of shared information ($ICC_u = .84$)
     
     = Repetition rate of shared information / (repetition rate of shared info + repetition rate of unshared info)

  2. Recall bias in favor of shared information ($ICC_u = .98$)
     
     = Proportion of recalled shared info to all recalled information

  - Correlation between both indicators = .57

- **Motive for sharedness bias** ($Cb. \ Alpha = .60$)
  
  - Postquestionnaire: e. g. „During discussion, it was important to me to confirm arguments mentioned by other members.”
Experimental Results: Actual sharedness bias

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissent vs. consent</td>
<td>.01</td>
</tr>
<tr>
<td>Intervention</td>
<td>.09</td>
</tr>
<tr>
<td>Dissent x intervention</td>
<td>.12</td>
</tr>
<tr>
<td>No significant effect (all p's &gt; .23)</td>
<td></td>
</tr>
</tbody>
</table>
As expected, the motive to confirm other's information and be confirmed by others was reduced by dissent or by information intervention, but also by preference intervention.
Preference Bias: Measures

Group level

• Preference negotiation ($ICC_u = .88$) as a combination of
  1. Proportion of preference expressions to all expr. (z-stand.)
  2. Info mentioned before first pref. expr. (z-stand. and reversed)
     • Correlation between both indicators = -.35

• Preference-consistent information exchange ($ICC_u = .89$)
  • Prop. of mentioned pref.-cons. to all mentioned evaluative info

Individual level

• Preference-consistent information evaluation as a combination of
  1. Proportion of recalled preference-consistent info ($ICC_u = .98$)
  2. Motive for preference bias (Cb. Alpha = .62)
     • Postquestionnaire: e. g. „During discussion, I considered information against my favorite candidate convincing.“ (reversed item)
     • Correlation between both indicators = .62
As expected, expression of many evaluations early in the discussion was reduced by preference intervention.
Exp. Results: Preference-consistent Information Exchange

As expected, preference-consistent information exchange was reduced by preference intervention.

Interestingly, dissent enhanced argumentation for own preference.

<table>
<thead>
<tr>
<th></th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissent vs. consent</td>
<td>**.27</td>
</tr>
<tr>
<td>Intervention</td>
<td>**.31</td>
</tr>
<tr>
<td>Dissent x intervention</td>
<td>.10</td>
</tr>
</tbody>
</table>

** $p < .05$
Exp. Results: Preference-consistent Information Evaluation

As expected, also preference-consistent information evaluation was reduced by preference intervention as well as by dissent.

<table>
<thead>
<tr>
<th></th>
<th>Eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dissent vs. consent</strong></td>
<td>** .18</td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>*** .36</td>
</tr>
<tr>
<td><strong>Dissent x intervention</strong></td>
<td>.04</td>
</tr>
</tbody>
</table>

** p < .05, *** p < .01
**Experimental Results: Decision Quality**

After selecting one candidate, groups should rank order the other candidates. Decision quality = Reversed rank position of correct candidate.

- Decision quality (z-values)
  - **Control**
  - **Info**
  - **Pref**

<table>
<thead>
<tr>
<th></th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissent vs. consent</td>
<td>0.04</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.07</td>
</tr>
<tr>
<td>Dissent x intervention</td>
<td>0.09</td>
</tr>
</tbody>
</table>

No sign. global effect (all p's > .37).

But: sign. dissent-contrast within control condition ($p_{\text{one-tailed}} < .10$)

Dissent enhanced decision quality only when no intervention was applied.

Unexpectedly, the interventions were not able to improve decision quality.
Correlations: Process Variables and Decision Quality

**Input**

- Information intervention
- Dissent
- Preference intervention

**Process**

- Systematic process
  - Introduced information
  - Recalled information
- Sharedness bias
  - Actual
  - Motive
- Preference bias
  - Preference negotiation
  - Information exchange
  - Information evaluation

**Output**

- Decision quality

Correlations:
- Negative Spearman Corr. (p<0.05)
  - Introduced information: -.40
  - Recalled information: -.36
Ulrich Klocke: How to Improve Decision Making in Small Groups

Correlations and Experimental Effects

Input

Information intervention

Dissent

Preference intervention

Process

Systematic process.

Introduced information

Recalled information

Sharedness bias

Actual

Motive

Preference bias

Preference negotiation

Information exchange

Information evaluation

Output

Decision quality

-0.40

-0.36

Negative Spearman Corr. (p_{onetailed} < 0.05)

Positive effect

Negative effect
Summary and Conclusion: Interventions

- A clarification of defective decision processes combined with a group exercise
  - reduces biased processing in favor of own preference (at group and individual level),
  - reduces motive for biased processing in favor of shared information,
  - enhances information pooling,
  - but does not improve decision quality.

- Decision quality
  - is influenced by improved evaluation of preference-inconsistent and unshared information (individual level variables)
  - but not by information exchange (group level variables);
  - might be improved by a combination of both interventions and a stronger focus on individual processing.
Summary and Conclusion: Dissent

- Dissent
  - has opposite effects on preference bias at group versus individual level:
    - enhances preference-consistent information exchange (stronger effort to convince the others),
    - but reduces preference-consistent information evaluation (more unbiased, divergent thinking)
  - enhances decision quality only when no intervention is applied.
Thank you very much for your attention!