Channels of multimodal communication: Relative contributions to discourse understanding

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COMMUNICATION CHANNELS

Vocal: Verbal and prosodic (see e.g. Cuttenrden 1986, Kotzasov 2009)
Visual: Body language (gesture, mimic, gaze, posture, etc.) (see e.g. McNeill 1992, Burgoon et al. 2011)

The multimodal approach
Take all the communication channels into account. For a communicating person it makes no difference how intention or meaning is conveyed.

Views on the significance of communication channels
Mainstream linguistics: The verbal channel is of prime importance, other channels are treated by “paralinguistics” if at all noticed

Applied psychology: quoting Mehrabian 1971, it is often claimed that body language conveys 55% of information, prosody conveys 38% of information, and the verbal component only 7% of information

• all communications channels are significant
• they operate in an integrated manner
• each mode is a partial bearer of the overall meaning of the message” (Kress 2002)

Research question
What is the ACTUAL contribution of each channel to the overall discourse understanding?

NOVEL EXPERIMENTAL METHOD

Isolate the three communication channels
In order to assess the contributions of individual channels, they can be artificially separated:
Verbal, prosodic, and visual channels presented individually

Channels are presented in two, e.g. “verbal+visual”

The null group: necessary to assess what can be inferred from background knowledge
The original group: necessary to assess normal understanding

In toto – eight experimental groups (2x3x2)

Material
Video recording of communication events
Context except and experimental except

Assess discourse understanding
Questionnaire addressing the information contained in the experimental excerpt
Share of correct answers can be used as a quantitative assessment of the degree of discourse understanding.

MAIN EXPERIMENT

Modifications/improvements of the prior experiment

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<td>Natural Russian dialogue between two speakers, a man and a woman (guessing game</td>
<td>Little garage)</td>
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<td>Possible familiarity with the movie</td>
<td>More satisfactory “behind the wall” effect</td>
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<td>Prosodic condition</td>
<td>Excessive noise in the “prosodic atone” condition</td>
<td>Radically decreases the signal at all frequencies except for the speaker’s average F0 frequency</td>
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PRIORITY EXPERIMENT

Material (El’bert 2007, Klibrik and El’bert 2008)
Russian TV series “Tajny sledstviya” (“Mysteries of the investigation”)
Context excerpt: 8 minutes from the beginning of a series
Experimental excerpt: 3 minutes and 20 seconds

Channels
Verbal: temporally aligned running subtitles
Prosodic: “behind the wall” filter

Participants
Eight groups 10 to 17 persons, 99 participants altogether
The whole group of participants watched material on a large screen

Questionnaire:
23 multiple-choice questions
What Tamara Stepantova offers Masha before the beginning of the conversation:

| a. to take off her coat | plausibly correct |
| b. to have a cup of tea | plausible |
| c. to have a seat | correct |
| d. to have a drink | implausible |

Results

• Each individual channel is substantially informative and significantly prevails over the null condition (leftmost column, 38.3%) Mean(Whitney test, p<0.05)
• Verbal (72.4% correct answers) > visual (61.7%) > prosodic (51.5%) Mean(Whitney test, p<0.01)
• The verbal condition is significantly lower than the original material condition (rightmost column, 87.4%) Mean(Whitney test, p<0.05)

DISCUSSION AND CONCLUSIONS

The overall results of the two experiments are remarkably similar, in spite of the multiple methodological differences

That probably means that our conclusions about the relative contributions of various communication channels to the overall discourse understanding are fairly robust

Calculation of normalized contributions of the three channels

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<th>Main experiment</th>
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<tr>
<td>Verbal</td>
<td>72% 1.86-39%</td>
<td>59% 1.51-39%</td>
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<tr>
<td>Prosodic</td>
<td>52% 1.86-28%</td>
<td>40% 1.51-26.5%</td>
</tr>
<tr>
<td>Visual</td>
<td>62% 1.86-33%</td>
<td>52% 1.51-34.5%</td>
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All communication channels are highly significant in encoding content and discourse understanding. The common attitude in linguistics, according to which linguistic communication is performed mostly by the verbal component, whereas other channels are negligible, is incorrect.

Among the communication channels the verbal channel is the leading one. The viewpoint popular in applied psychology, according to which the contribution of the verbal component is negligible, is erroneous as well.

Participants have difficulties integrating the information from the visual and prosodic channels, in the absence of the verbal channel. In normal communication the verbal channel plays the role of an anchor to which the information from other channels is attached.

Directions for further studies: monologic discourse; further work on isolating the verbal channel.