

Different explanation topics, different gestural dimensions?

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10th ISGS 2025, July 9-11, Nijmegen

Background

- When the explanandum is absent from the shared space,
- explainers rely on co-speech gestures to construct imagined spaces and provide the explainees with spatial orientation [1,2]
- by employing gesture dimensions, such as deixis, iconicity, and temporal highlighting [3].
- Gesture deixis does not decrease even when explainers monitor explainees' understanding [4].
- **How are gesture iconicity and temporal highlighting along with gesture deixis distributed within different categories of explanation topics?**

Hypothesis

Along the dimension of gesture deixis, gesture iconicity is expected to dominate in topics concerning object features, whereas temporal highlighting is expected to dominate in topics concerning action processes and conditional rules.

Motivation

- Iconicity is used to depict object features and actions [3,7,8,9].
- Temporal highlighting is used to put emphasis on important syntactic / semantic content [3,10].

MUNDEX CORPUS [5], N = 24

- game absent phase
($M_{\text{Duration}} = 07:04 \text{ min}$, $SD = 03:44 \text{ min}$)
- Analysis of proportions with GLMM [6]

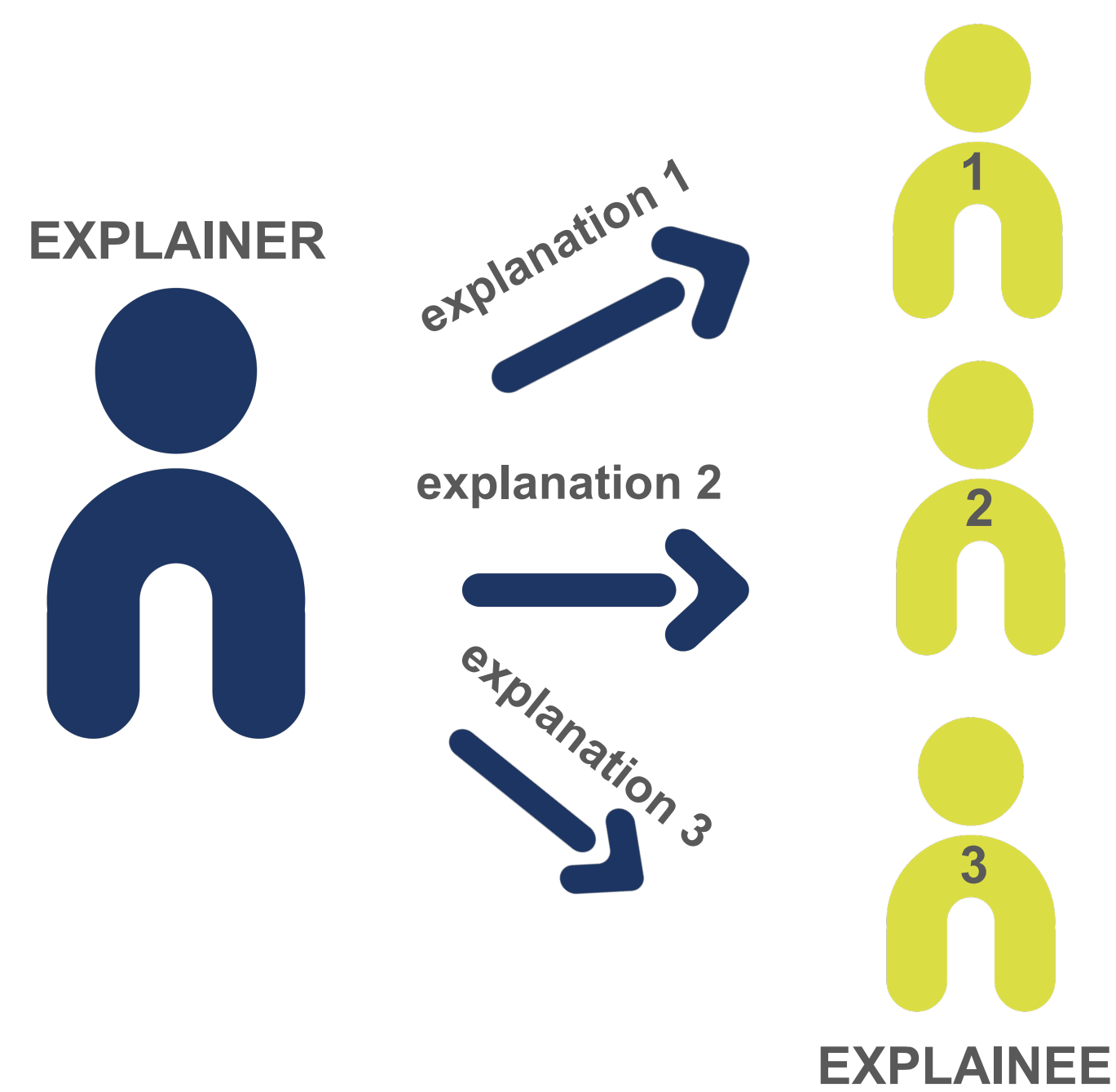


Fig 1. Data collection design

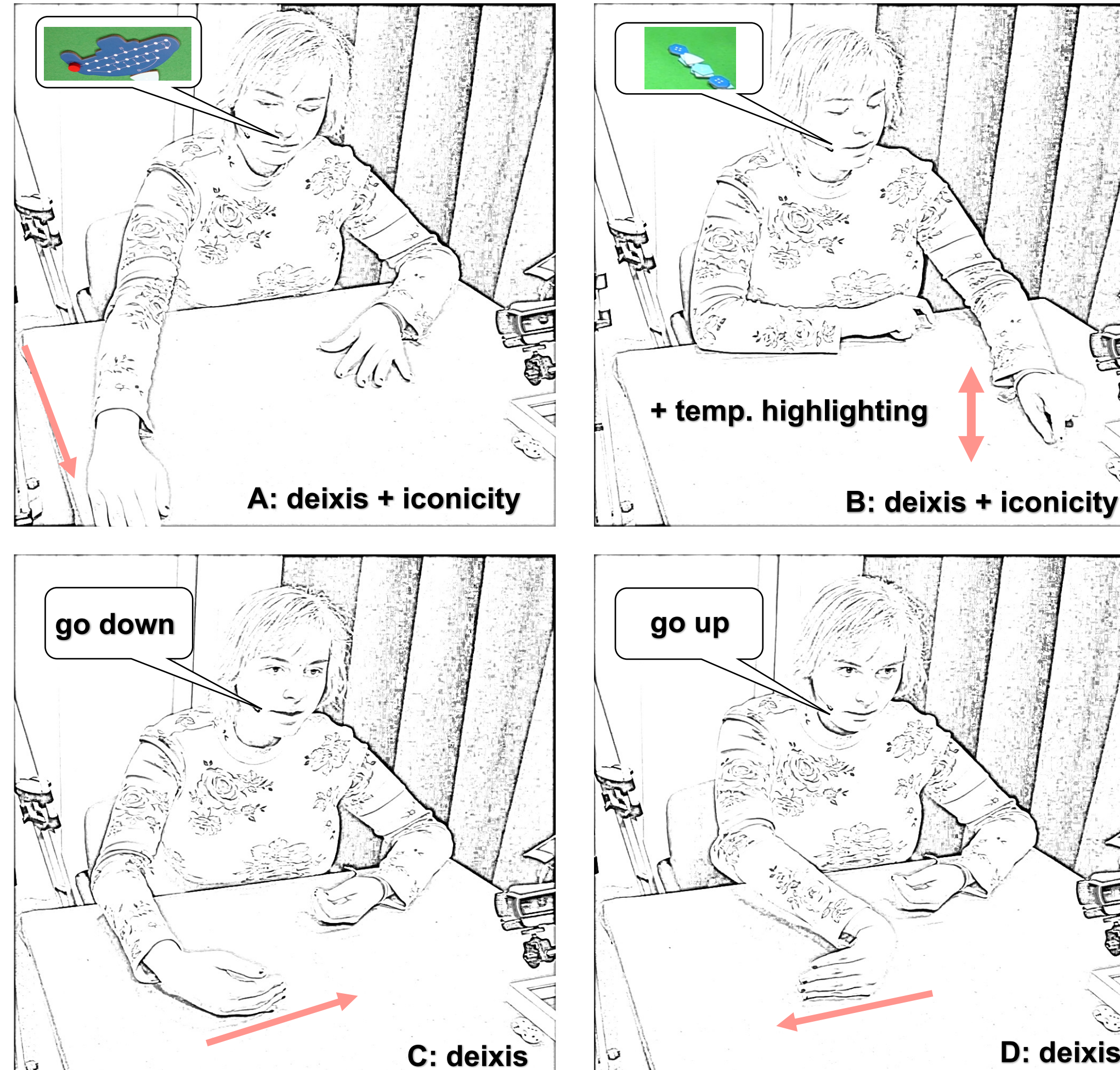


Fig 2. Annotation of co-speech gestures ($\kappa = 0.94$).

Object features	Action processes	Conditional rules
Game preparation	Turn Progressions	End of a round
- Submarine	- Announcing directions	- Successful return
- Oxygen	- Reducing the oxygen	- Unsuccessful return
- Treasure chips	- Subtracting steps	- Cleaning the pathway
- Empty chips	- Action decision	
- Explorer tokens	- Skip each other	End of the game
- Dices		

Tab 1. Annotation of game-specific explanation topics ($\kappa = 0.79$).

Results

- No significant difference between iconicity and temporal highlighting in topics about object features.
- Temporal highlighting occurred significantly more often than iconicity in topics about action processes and conditional rules.
- **The hypothesis could be partly verified.**
- Higher variation within each explainer interacting with different explainees than across the 8 explainers.

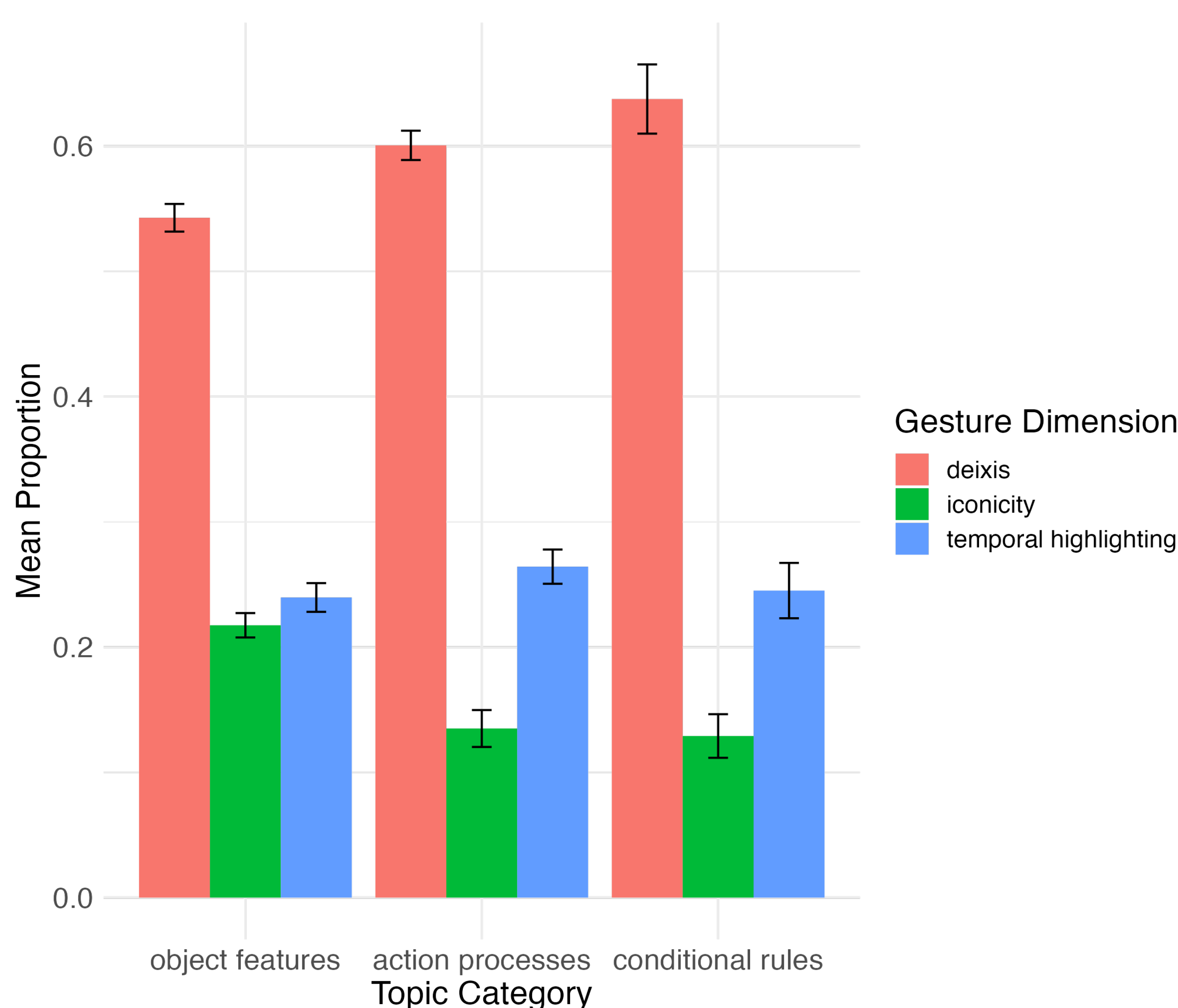


Fig 3. Proportional frequencies of gesture dimensions within categories of explanation topics.

contrast	Est	SE	z	p
Deixis - Iconicity	1.28	.2	6.51	<.0001
Deixis - Temp. highlighting	1.18	.19	6.06	<.0001
Iconicity - Temp. highlighting	-.1	.2	-.49	.877

Tab 2. Pairwise comparisons (Tukey) within object features.

contrast	Est	SE	z	p
Deixis - Iconicity	2.36	.22	10.72	<.0001
Deixis - Temp. highlighting	1.28	.19	6.61	<.0001
Iconicity - Temp. highlighting	-1.07	.22	-4.82	<.0001

Tab 3. Pairwise comparisons (Tukey) within action processes.

contrast	Est	SE	z	p
Deixis - Iconicity	3.34	.24	14.08	<.0001
Deixis - Temp. highlighting	2.49	.21	11.63	<.0001
Iconicity - Temp. highlighting	-.86	.24	-3.58	.001

Tab 4. Pairwise comparisons (Tukey) within conditional rules.

Discussion

- The continuous use of deixis is related to the absence of an explanandum [2,4,11].
- Spatial references and temporal highlighting are performed more frequently than object depictions.



SCAN FOR
SUPPLEMENTARY DATA
AND REFERENCES