Facial Expressions and Speech Acts in Non-signers

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OVERVIEW.
Sign languages incorporate facial expressions as part of their grammatical system. In addition to 'affective' uses (shared with spoken language) that express mental state ([2]), sign languages also use grammaticalized facial expressions to express both descriptive meanings (e.g. 'carelessly') and abstract aspects of meaning ([4]). In the latter category, for example, American Sign Language shows different facial expressions for indicative statements (neutral expression), yes-no questions (raised eyebrows), and wh-questions (furrowed eyebrows).

Do hearing non-signers employ facial expressions for similar abstract, linguistic purposes ([1])? In this study, we tested whether non-signers are able to identify a speech act of a "gestured sentence" based on only facial expressions. We focus on four speech acts: indicative sentences, imperative sentences, wh- questions, and yes/no questions.

EXPERIMENT.
Stimuli. We used four emblematic gestures used in American culture: thumbs up (GOOD), thumb pointing (HIM), wrist tap (TIME), and finger rub (MONEY). For each of these gestures, we generated a list of four sentences that could be communicated with the gesture; the four sentences each exemplified a different speech act (e.g., MONEY theme: "It's expensive." / "Pay up!" / "How much is it?" / "Do you need money?"). An English-speaking American produced each of the four gestures in what felt like a natural way to communicate each of the four meanings, resulting in 16 total videos.

Task. In an online survey, non-signing American subjects were asked to watch each set of stimuli videos, and match the four variants to the four provided meanings. In Experiment 1, subjects saw full videos including both the gesture and the facial expression. To verify that matching was based entirely on facial gestures, Experiment 2 used the same materials, but cropped the videos to include only the face. To control for irrelevant theme-specific facial expressions, Experiment 3 used the same materials as Experiment 2, but randomly mis-matched the sets of meaning choices with the sets of stimuli videos (e.g., money-themed meaning choices could accompany facial expressions from the TIME videos). Experiment 4 investigated the degree to which these meanings were extracted from static vs. dynamic cues; the procedure was identical to Experiment 3, except that stimuli were pictures of the facial expression instead of videos.

Results. In all experiments, subjects performed above chance for each speech act. Accuracy decreased (but still remained above chance) in Experiment 4, in which pictures were used; this was strongest for indicative sentences, where a nodding gesture was lost in static images.

DISCUSSION.

In spoken language, facial expressions are often taken to be 'paralinguistic,' separate from linguistic composition. Our results show that facial expressions *can* be used by non-signers to recover abstract properties about a speech or communicative act. Is there an innate underpinning to these gestures ([3])? As it turns out, many of the cues used in this experiment are also used for similar purposes in ASL (e.g., raised/furrowed eyebrows). Follow-up work investigates this possibility further, including an analogous experimental design in which American non-signers identify speech acts in French Sign Language.

REFERENCES

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