

The Co-Occurrence of Iconic and Beat Gesticulation in Speech

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Purpose of Study

- Purpose of study is to determine if gestures that co-occur with speech semantically related.
- Also to investigate role of gesticulation in speech prosody.
- Further analyzed differences in time for rhythmic gestures during speech and alone; to determine underlying cognitive importance.
- This data can aid development for understanding language deficits.

Understanding Gesture

- Gesticulation is the movement of the body that exhibits meaning.
- Gestures can specify emotion, thought and action in ways speech is unable to provide.
- Speech can be understood without gesture, and gesture can be understood without speech, but the two can reinforce each other.
- These specifications help us to understand the cognitive and communicative properties of gesticulation separate from speech.

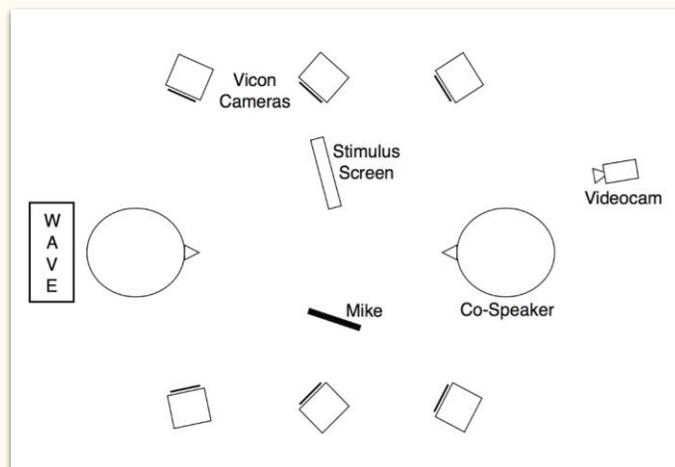
Background of Study

- Participant is an adult male; monolingual speaker of American English.
- Instructed to describe events in cartoon.
- Audio, video and kinematic data was recorded for accurate transcription.

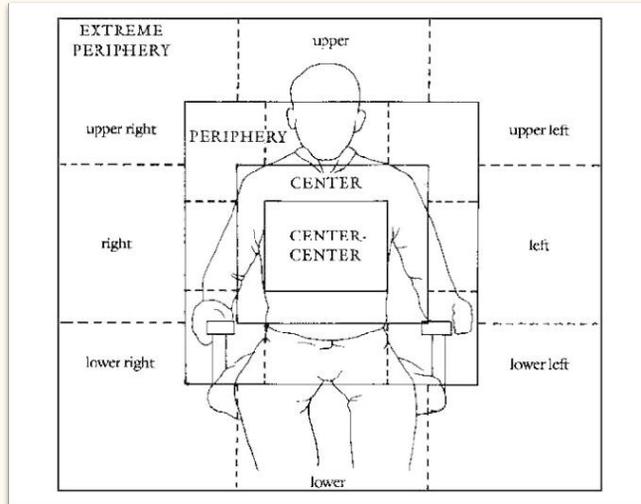
Methods

1. For the purposes of this study only the audio and video data was analyzed and transcribed. The audio was transcribed into a Microsoft Word file.
2. This information was then transferred into a spreadsheet where the time stamps were placed on each transcription.
3. In other cells, information was included regarding the shape, position and movement of the gestures, as well as the form and timing of the gestures.
4. To facilitate timing analyses, notations were then embedded into the speech transcription to mark the exact words that gesticulation co-occurred with.
5. The audio and video information was reviewed again to include pauses, beats within those pauses, how they compared to the beats made during speech and what it may allude to in the cognitive process.

Research Space



Division of the Gesture Space - Pedelty (1987)



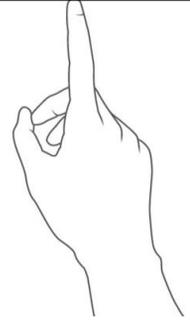
ASL Handshapes - Friedman (1977)

Table 3.5 Hand Shapes Used for Iconics in Six Cartoon Narratives (ASL hand shapes from Friedman 1977)

ASL Hand Shape	Speaker						All
	1	2	3	4	5	6	
	56	63	83	77	70	67	416
	Percentage of Iconics						
A	4	11	11	8	23	13	12
S	5		4	3		33	7
O	4	6	14	1	1		5
tapered O	9			1			1
baby O	5	6	4	1	3	9	5
B	4	3		1	3	9	3
B spread	7	6	6	1	3		4
C	7	10	16	24	6	9	12
S	21	42	31	34	49	10	31
4				1			<1
bent S	5	3	7	10	4	12	7
P		2	1				<1

continued

Coding the Data- Gesture Types



- Representational gesture types represent attributes, actions or characters. There are two types.
 1. Iconic- Gestures that hold a close and formal relationship with semantics.
 2. Metaphoric- Gesticulation of abstract concepts .
- Deictic- Finger pointing, or other indications of either concrete or imaginary objects or people.
- Beats- Formless hands that convey no information, but move in rhythmic relationship to speech. Can take the form of finger tapping, minimal movement involved.

Coding system by McNeill and Levy 1982

A Closer Look-Semantics



- Multiple instances where speaker specifically made gestures that had exact semantic value to speech; holding true to iconic classification.

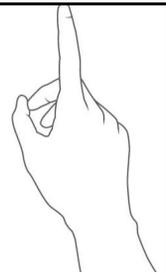
Frame Numbers	Spoken Utterance	Location	Handshape	Orientation	Gesture Type	Notes
01:42-01:44	and so [he opens] the door goes in and there's	Center to Lower mid Left	LH 5	Fingers away from body , palm facing center and then right gesture space	Iconic	Gesture made to represent opening of door

A Closer Look- Semantics Continued



Frame Number	Spoken Utterance	Location	Handshape	Orientation	Gesture Type	Notes
01:44-01:45	[a piece] of luggage like a suitcase	Upper left to lower mid left	LH 5	Fingers away from body, palm facing center	Deictic	Raises and drops hand to depict suitcase laying on floor

A Closer Look- Beats



- Gesture beats closely analyzed during an utterance and when there was no speech present.
- It was found that beat gestures typically executed to start an utterance, or in between each word in an utterance.

Frame Number	Spoken Utterance	Location	Handshape	Orientation	Gesture Type	Notes
00:24-00:34	[It's been] a long time since I saw anything Looney Tunes. # you see the cat looking through a pair of binoculars #, and he looks at an apartment building that I think is called the broken arms department	Lower mid Right	LH 5	RH Fingers away from body, Palm towards center	Beat	One beat

A Closer Look- Beats Continued

Frame Number	Spoken Utterance	Location	Handshape	Orientation	Gesture Type	Notes
2:25-2:25	(No speech)	Lower mid left	LH 5	Fingers away from body, palm facing center	Beat	Does exactly one before he begins utterance
2:25-2:26	The first attempt he just tries to	Lower mid left	LH 5	Fingers away from body, palm facing center	Beat	Completes a beat during pause between words

A Closer Look- Beats Continued

Frame Number	Spoken Utterance	Location	Handshape	Orientation	Gesture	Type
00:58-01:10	In the cage? Yeah yep, that was an <uh uh> entertaining uh part of it particularly believable of course # , [<um> he attempts to impersonate a like a bellhop somebody who carries around the]	Lower mid left and right	SH 5	Fingers away from body, palm facing center	Beat	Repeated alternation beats until the end of the utterance

Conclusion

- Preliminary analyses suggests that there is a strong semantic relationship between gesture and speech.
- Beat gestures before an utterance are an aid to inspire speech
- During an utterance, a tool to possibly keep the speaker on track.
- Relationship between language and gesture structure has been studied in many different languages
- For future studies, more narration tasks can provide more data that indicate strong semantic relationship between gesture and speech.
- This information can shed light on cognitive aspects of language expression to help with language deficits