

# Children Learn to Use Iconic Gestures with Different Words Through Exposure

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## Introduction

- Children often gesture when speaking (McNeill, 1992).
- Iconic gestures depict aspects of concrete events and objects (e.g., the bouncing motion or round shape of a ball).
- Iconic gestures are used at different rates with different word types.
- Japanese monolingual adults gestured more with sound symbolic words (SSW; 97%) than verbs (40%; Kita, 1997).
- In SSWs, an aspect of the sound relates to the word's meaning, as for onomatopoeia (e.g., *boing* or *pyon* referring to jumping).
- 3- and 5-year-old Japanese monolinguals gestured more with descriptions containing SSWs (80%, 85%) than other words (40%, 55%; Kita, Özyürek, Allen & Ishizuka, 2011).
- They proposed that iconic gestures and SSWs are linked early in development because they share an underlying mental representation.
- But iconic gesture rates with SSWs increased with age.
- There is evidence that children learn gesture use from their caregivers (Özcalışkan & Goldin-Meadow, 2005).
- Similar amounts and types of gestures were produced by children and caregivers.
- Therefore, Japanese children might learn that SSWs and iconic gestures are strongly linked through exposure to their co-expression.

## Present studies

1. Are children's iconic co-speech gesture rates linked consistently to specific word types across different languages? (Monolingual study)
  - SSWs are more frequent in Japanese than English or French. Thus we compared Japanese monolinguals' gesture rates with SSWs and manner verbs (MV) that conveyed the same information.
  - Gesture rates with MVs were compared across Japanese-, English- and French-speaking monolinguals.
2. Is the production of word-specific gesture rates learned through co-speech gesture exposure? (Bilingual study)
  - Compared to monolinguals, bilinguals have reduced exposure to each language.
  - Japanese-speaking bilinguals have reduced exposure to the frequent co-expression of SSWs and iconic gestures.
  - Bilinguals have exposure to the co-expression of MVs and iconic gestures in each language, which is comparable to same-aged monolinguals' exposure.

## Methods

### Materials

- **Referential Communication Task (RCT)**
  - 4 pairs of animated animal cartoons with a star above the target cartoon.
  - Each cartoon pair was identical except for one difference in the animal's manner of motion.
  - Children described the differences so the experimenter could guess the target cartoon.



Figure 1. Flapping wings Gliding

- **Expressive One-Word Picture Vocabulary Test (EOWPVT)**
  - to verify if the monolinguals had similar levels of language proficiency.
  - to determine the bilinguals' language dominance.

### Procedure

- The bilinguals had a session in each language 1-3 weeks apart.
- The RCT sessions were video-recorded.

### Coding

- Each verbal description on the manner of motion was coded as:
  - a MV, a SSW, a MV and SSW, or other word types.
  - with or without an iconic gesture.

### Dependent measures

- Iconic gesture rates for MVs:
  - # descriptions with MVs & iconic gestures
  - # descriptions with MVs
- Iconic gesture rates for SSWs:
  - # descriptions with SSWs & iconic gestures
  - # descriptions with SSWs

## Monolingual study

### Participants

- 3 groups of monolinguals aged 4- to 6-years.

Language group	N (n male)	Age (y:m)		Vocabulary score (raw)	
		M	SD	M	SD
English monolingual	22 (13)	4;10	0;10	43.86	13.18
French monolingual	22 (9)	4;11	0;8	37.41	10.69
Japanese monolingual	22 (8)	5;2	0;5	37.14	9.92

### Predictions

- Japanese monolinguals: higher gesture rates with SSWs than MVs.
- All monolinguals: no difference in gesture rates with MVs.

### Results

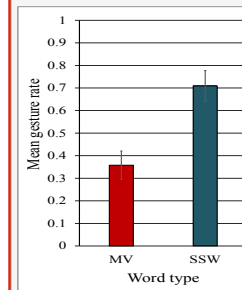


Fig 2. Japanese monolinguals' gesture rates with SSWs significantly higher than with MVs,  $t(21) = 4.66, p < .001$ , one-tailed.

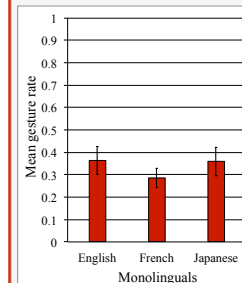


Figure 3. All monolinguals' Gesture rates with MVs not significantly different,  $F(2,62) = 0.77, p = .468$ .

## References

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## Acknowledgments

This research was supported by SSHRC, FQRSC and a Grant-in-Aid for Scientific Research from the Japan Society for the Promotion of Science. Thanks to Alexis Haikalas, Alisa Koyama, Alison Dick, Andrea Tiefenbach, Andrew Pinchinsky, Azusa Yamaguchi, Carrie Cheung, Chigusa Kurumada, Kayo Nakamura, Kristin Fasciano, Kyoko Sato, Galia Pogossova, Gill Fruchter, Hisako Noguchi, Hitomi Mitsuo, Irina Pivneva, Leila Salem, Mara Nalewajek, Mari Umeda, Mary-Jane Blais, Michi Tomoda, Patricia Groleau, Serina Nishioka, Yasuko Senoo, and Yuri Fujisaki for scheduling and testing the participants, and for transcribing and coding the data. Thanks to Marie Lippeveid and Tom Shultz for helpful discussion and comments. We also thank the Montreal Japanese Language Centre, Japanese Canadian Cultural Center of Montreal, Mominoki daycare and all the children and parents for their participation.

## Bilingual study

### Participants

- 1 group of English-Japanese bilinguals and 2 groups of French-Japanese bilinguals aged 4- to 6-years.

Language group	N (n male)	Age (y:m)		Vocabulary score (raw)					
		M	SD	English		French		Japanese	
				M	SD	M	SD	M	SD
English-dominant bilingual	11 (6)	6;1	0;7	49.55	11.10	-	-	27.27	10.91
French-dominant bilingual	9 (5)	6;0	0;6	-	-	34.89	9.66	20.00	14.82
Japanese-dominant bilingual	8 (4)	5;1	0;10	-	-	13.75	8.81	25.00	5.04

### Predictions

- All bilinguals speaking Japanese: no difference in gesture rates with SSWs and MVs.
- All bilinguals using MVs: no difference in gesture rates with MVs in each language.

### Results

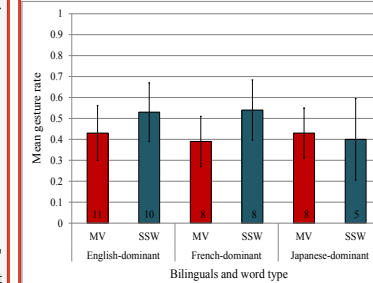


Figure 4. All bilinguals' gesture rates with Japanese SSWs not significantly different from that of MVs,  $p's > .05$ .

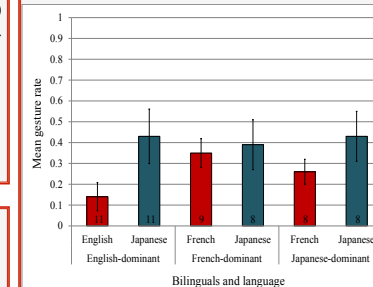


Figure 5. No significant Difference in gesture Rates with MVs Across languages for French-Japanese Bilinguals,  $p's > .05$ . A significant difference In gesture rates for English-Japanese Bilinguals,  $T(10) = 3.03, p = .012$ , two-tailed

## Conclusions

- The findings suggest that some word-specific gesture rates, such as for MVs, are consistent cross-linguistically.
- Furthermore, children appear to learn to gesture at different rates with specific words through exposure to the co-expression of iconic gestures and those words.
- When exposure is reduced, as in the case of bilingualism, gesture use with specific words is also reduced, as was found for Japanese SSWs.