



Gesture Use by Late Talkers at 16 months and 6 Years of Age

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Abstract

Use of communicative gestures in naturalistic communication samples were analyzed when children were toddlers and again when they were 6 years old. Children with delay in comprehension and production at 16 months of age (LC) produced significantly fewer gesture types and tokens than those with delays only in production (LP) or with typical development (TD). LC did not differ from 13 month old typically developing children matched for vocabulary comprehension and production. At 6 years of age all children scored within the normal range on standardized tests of language. LC produced significantly more communicative gestures tokens than TD, consistent with findings for children with specific language impairment.

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References

- Thal, D. and Bates, E. (1988). Language and gesture in late talkers. *JSHR*, 11, 115-123.
- Thal, D. & Kitch, J. (1996). Predictions in early identification of specific language impairment: Does the early bird always catch the worm? In K. Cole, P. Dale, & D. Thal (Eds.), *Assessment of Communication and Language*. Baltimore, MD: Brookes.
- Iverson, J. & Thal, D. (1997). Communicative transitions: There's more to the hand than meets the eye. In A. Weatherly, S. Warren & J. Reichle (Eds.), *Transitions in Prelinguistic Communication: Pre-intentional to intentional and pre-symbolic to symbolic*. Baltimore: Brookes.
- Evans, J., Alibali, M., & McNeill, N. (2001). Divergence of verbal expression and embodied knowledge: Evidence from speech and gesture in children with specific language impairment. *Language and Cognitive Processes*, 16, 309-331.
- Rodrigue, S., Sizemore, M., & Thal, D. (2004). Gesture use in late-talking toddlers: What children show and parents tell. Poster presented at SRCLD, June.
- Thal, D. (2006). Early language delay and specific language impairment: Categorical, dimensional, and individual differences perspectives. CUNY conference in honor of M. Bergman. New York, April.

Background and Purpose

Low levels of gesture production (both total number of tokens and type) are consistently related to persistent language delay during the earliest stages of communicative development. Late talkers with delays in language comprehension and production (LC) have been shown to use significantly fewer gestures. They are also at greater risk for continued language delay and diagnosis of language impairment (LI) at school-age than those with typical language development (TD) and late talkers with normal comprehension (LP). School-age children with LI use more representational gestures to refer to semantic information that is lacking in their oral language than TD.

In this study we examined the use of communicative gestures by LC, LP and TD identified at 16 months of age and again when the children were 6 years old.

We hypothesized that LC would use fewer gestures at 16 months of age and more gestures at 6 years of age.

Method

Parents of 127 children completed the MacArthur-Bates Communicative Development Inventory: Words and Gestures (CDI; Fenson et al., 1993) when children were 13 or 16 months of age. Children were assigned to one of five language groups on the basis of the resulting vocabulary percentiles. A smaller number of these children were re-evaluated when they were 6 years of age.

Language Group	CDI Scores
Late Comprehenders (LC) 16-m N=20 6y N=5	≤ 10 th percentile - words comprehended; ≤ 15 th percentile - words produced at 16 months
Late Producers (LP) 16-m N=37 6y N=11	≤ 10 th percentile - words produced; > 10 th percentile - words comprehended at 16 months
Typically Developing – Comprehension-Matched (TD-CM) 13-m N=16	Matched to LC words understood; >10 th percentile on both production and comprehension at 13 months
Typically Developing – Production-Matched (TD-PM) 13-m N=16	Matched to LP words produced; >10 th percentile on both production and comprehension at 13 months.
Typically Developing – Age-Matched (TD-AM) 16-m N=16 6y N=18	> 10 th percentile - words comprehended and produced at 16 months

Communicative gestures were identified and analyzed from spontaneous communication samples.

For the toddlers, number of words produced was also determined.

Age	Communication Samples
13- and 16-Months	10 minutes of play with a caregiver and 10 minutes of play with a trained experimenter. All language and communicative gestures were transcribed and coded using CHAT. Percent agreement (10% of samples) – 84-96%
6 Years	Retelling one short episode of an animated wordless cartoon about a mouse and an elephant to a naive listener. Percent agreement (18% of samples) – 80-94%

Age	Gesture Definitions
13- and 16-Months	Deictic and referential gestures that were •directed to another person •not a direct motor act on an object or other person (Goldin-Meadow, 2005)
6 Years	Deictic or representational (McNeill, 1992, coding manual by Evans and Alibali, 2005)

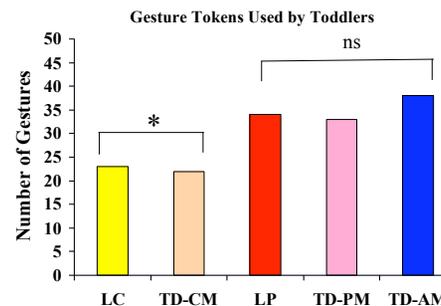
Results

Toddler Language

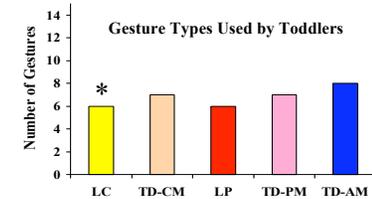
Both language delayed toddler groups and their language-matched controls produced significantly fewer words ($F(1,4) = 18.04, p = .000, \eta = .37$), different words ($F(1,4) = 27.04, p = .000, \eta = .47$), and utterances ($F(1,4) = 22.36, p = .000, \eta = .42$), than TD and did not differ from each other, confirming the CDI classification.

Toddler Gestures

LC and TD-CM used significantly fewer gesture tokens than the other groups ($F(1,4) = 3.97, p = .005, \eta = .11$).



LC used significantly fewer gesture types than all other groups ($F(1,4) = 3.24, p = .02, \eta = .10$).



Resampling statistics were used for all analyses at 6 years of age because of the small number of children.

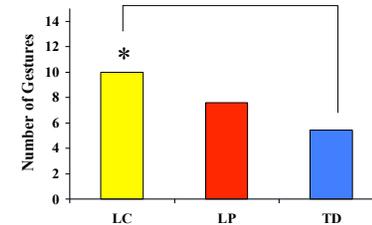
Language at 6 years

- No differences in overall story completeness.
- Not all children produced gestures with their language story retells (no difference between groups).
- Gesture users produced significantly more utterances than those who did not gesture ($p = .05$).
- PPVT scores were significantly lower for LT who used gestures than for those who did not gesture ($p = .01$).

Gestures at 6 years

- 7 LP, 3 LC and 12 TD used gestures in their retell ($\chi^2 = .06, ns$).
- LC used significantly more different gestures than TD ($p = .05$).

Gesture Types Used by 6-year Old Children



- LC used a significantly larger proportion of gestures per utterance than TD ($p = .05$).

Conclusions

- Patterns of gesture use across children with typical and atypical language development change over time.
- The changes suggest that gesture use is driven by cognitive development and is consistent with the hypothesis that conceptual development leads verbal development.