Recast Density and Irregular Past Tense Verb Acquisition

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The Recast Paradox

Children with SLI continue to lag behind in their grammatical development (Leonard, 1998, Rice et al., 1998) despite their apparently equivalent exposure to recasts in conversation (Fey et al., 1999) and their ability to learn grammatical forms when presented with recasts in intervention as quickly as do younger children with TL (Nelson et al., 1996).

Resolutions to the Recast Paradox Tested in this Experiment

1. Recasts are no more facilitative than any other type of input
   a. Recasts are no more usable in the input than are models
   b. Recasts are no more useful in facilitating grammatical learning than are models
2. Children with SLI are exposed to as many recasts as children with TL but learn from them less efficiently

Participants

- 13 children with SLI (M = 7 yrs 10 mos; SD = 6.5 mos) 8 girls, 5 boys
- 13 children with TL (M = 5 yrs 6 mos; SD = 7.1 mos) 7 girls, 6 boys

Observed group similarities in:
- Irregular past tense production (*R/W TEGI*, conversation)
- Relational Vocabulary (*TOLD-P:3*)
- Receptive Language (*TOLD-P:3*)

Observed SLI weaknesses in:
- Phenotypical characteristics of SLI:
  - Grammatical markers/finiteness (*R/W TEGI*, conversation)
  - Sentence Imitation, & Oral Vocabulary (*TOLD-P:3*),
  - Nonword Repetition (Dollaghan's Task)
- Nonverbal IQ: SLI > TL - raw score; TL > SLI - standard score (*TONI-2/3*)

Procedure

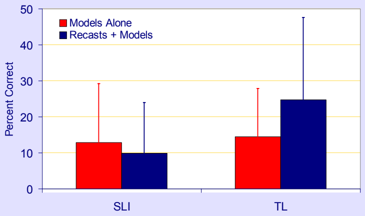
- First, taught the meaning of 6 novel verbs to receptive & expressive criteria
- Then, taught irregular past tense forms via controlled recast and model input
  - Dake-doke, jare-jore, kig-kug, ling-lang, plo-plew, twink-twank
  - Causative, transitive, telic, and likely to elicit past tense errors
  - Verbs represented unusual manners of toy activation
  - Play-based, conversational, hybrid therapeutic context
- Controlled input
  - Low density recast condition: 0.19 recasts/min. for 5 sessions
  - High density recast condition: 0.46 recasts/min. for 2 sessions
  - Equal numbers of verb exposures in both conditions in every session through provision of models
- Collected and categorized metalinguistic productions about verb learning

Question 1

Do conversational rates of recasts and models have the same effect on target verb learning for children with SLI and those with TL?

Results

Mean percent accuracy of spontaneous irregular verb use in the recasts + models and models alone conditions in experimental sessions 1 to 3



Children with TL:
- Reliably more accurate when the input included recasts
  - $F(1, 24) = 5.09$; $p = .03$; $d = .58$; 90th CI = -0.07 to 1.23

Children with SLI:
- No more accurate when the input included recasts
  - $F(1, 24) = 0.39$; $p = .54$
- SLI group less accurate than the TL group when input included recasts
  - $F(1, 24) = 3.90$; $p = .06$*; $d = .54$; 90th CI = 0.07 to 1.00

* The level of significance was set at $p = .1$ *a priori*

Discussion

The results refuted the first resolution to the Recast Paradox:
- Recasts were more facilitative of target verb learning than were models for children with TL

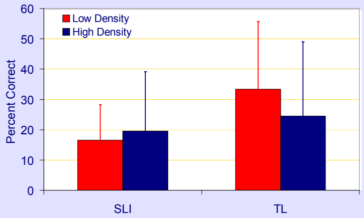
The results partially supported the second resolution:
- The children with SLI learned the verbs less efficiently than the children with TL at conversational rates of recasts

Question 2

Do children with SLI acquire the target verbs as efficiently as children with TL when exposed to intervention-like rates of recasts?

Results

Mean percent accuracy of spontaneous irregular verb use at low and high recast densities in experimental sessions 4 and 5



Children with TL:
- Unexpected decline in performance in the high density recast condition
  - Conversation: $F(1,24)=3.37$; $p=.08$; $d=.47$; 90thCI = -.014 to 1.08
  - Post-test Probe: $T=3.5$; $Z=1.77$; $p=.08$

Children with SLI:
- Unexpectedly, no improvement in the high density recast condition
  - Conversation: $F(1, 24) = 0.06$; $p = .80$;
  - Post-test Probe: $T=29.0$; $Z=0.36$; $p=.72$

Discussion

Children with TL: Consistent with a common learning construct:
- Distributed practice is more beneficial than massed practice
- There may be an upper limit to recast rates that are beneficial

Children with SLI: 3 possible explanations:
- Faulty premise in the Recast Paradox
- Processing limitations of children with SLI parallel the processing demands of recasts
- The rate of high density recast exposure was simply too low

These explanations are most consistent with the second resolution

Question 3

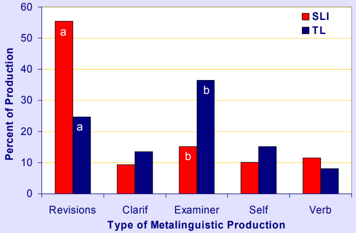
Are recasts usable and used by children with SLI and those with TL to facilitate learning of novel irregular past tense verbs?

Results

Children's Productions of Metalinguistic Comments & Questions
- Revisions/Self-corrections: *I jore, jared, it; I jared, jore it.*
- Requests for Clarification: *Is that kug or kigged?; What does dake mean?*
- Focus on experimenter productions: *Stop saying kug it!*
- Focus on self-productions: *I said kig not kug; I'm not getting any right.*
- Focus on the verb: *Jare, jore, jare, jore; It sounds like la; Kig or whatever.*

Usable:
- Frequency: The groups did not differ in the frequency with which they produced metalinguistic productions $U = 84.0$; $Z = -.03$; $p = .98$
- Distribution: Metalinguistic productions were more likely to follow recasts (p=.19) than models (p=.02), based on a conditional probability statistic

Used: Percent of production of each metalinguistic category



Discussion

Usable: Recasts were: (1) more salient in the input than were models
(2) equally salient for both groups

Refutes the first resolution — Indicates that recasts are usable

Used:

Participants focused their attention on the verb in the recast
- Participants displayed active comparison of the relevant verb contrast
- Category differences reflect strength of grammatical representation of the regular past tense –ed rule. TL: 88.8% accuracy; SLI: 66.2% accuracy

Supports the second resolution — Indicates that recasts are used

Resolutions: Summary

Resolution 1: Recasts are no more facilitative than any other type of input
- This resolution was not supported by the results
  - At conversational levels, children with TL produced the verbs more accurately when recasts were included in the input
  - Recasts were more salient in the input than were models for both groups
  - Both groups actively compared their verb representation to the adult standard.
  - Recasts of irregular past tense verb forms were usable and used

Resolution 2: Children with SLI are exposed to as many recasts as children with TL but learn from them less efficiently
- This resolution was partially supported by the results
  - The children with SLI had poorer representation of the regular past –ed rule and challenged the examiner's irregular past tense verb contrast less frequently than did the children with TL
  - At conversational recasts levels, children with SLI produced the verbs less accurately than the children with TL
  - But... when recast density was increased, the performance of children with SLI did not improve

Clinical Implications

- This is an early efficacy study, though other studies, representative of later efficacy research, already provide some support for the use of recasts in intervention (e.g., Fey et al. 1993, Nelson et al., 1996)
- 0.47 recast/min was not adequate for the SLI group to perform at levels equivalent to those of children with TL.
- A minimum recast rate of 0.8/min for specific morphosyntactic targets is recommended based on the studies of Camarata, & Nelson (1992), Camarata et al. (1994), and Leonard et al. (2004)
- There may be an upper limit on the rate of recasts beyond which they are not helpful *and may even limit learning*
- Children in both groups drew on metalinguistic skills to inform their learning and to retain correct forms

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