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The Relationship between Quality and Quantity in Parental Language Input to Deaf or Hard-of-Hearing Children

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Input quantity affects child outcomes

Children from professional families ≈ 2150 wds/hr (45 mil) Children from families in poverty ≈ 600 wds/hr (13 mil)

Amount of speech input predicts IQ & vocab at age 3, and language skills & academic achievement at age 9-10

Hart & Risley, 1995; Walker et al., 1994

Input quality also affects child outcomes

Parent measures of lexical diversity, syntactic complexity, conversational strategies, and verbal interaction style all predict subsequent child language.

Carroll et al., 2013; Hoff & Naigles, 2002; Huttenlocher et al., 2010; Rowe, 2012; Weizman & Snow, 2001

Which matters more—quantity or quality?

Hart & Risley advocated for increasing input quantity: “the most important aspect of children’s language experience is its amount” (pg. xxi). Other groups have reported that quality is a more potent predictor of child outcomes.

Hart & Risley, 1995 (2002 Preface); Hirsh-Pasek et al., 2015

Current Study

What is the relationship between quantity & quality of parental input?

Relate total number of words (TNW, or tokens) to measures of syntactic, lexical, and pragmatic quality from transcripts of parent-child interactions.

Methods

Participants

153 children in the Colorado Home Intervention Program (CHIP). All children have bilateral hearing loss with no other impairments, cognition within normal limits, and English spoken in the home.

71 females, 82 males. 3 African-American, 8 Asian-American, 26 Hispanic, 107 Caucasian, and 9 Mixed-Race.

Hearing Status, based on BEPTA: 28 mild [26-40 dB HL], 60 moderate [41-70 dB HL], 15 severe [71-90 dB HL], 10 profound [≥ 90 dB HL], 38 with cochlear implants, and 2 NR

Materials

632 SALT transcripts of parent-child interactions, from child age 0;3.20 to 7;3.28. M = 4.13 transcripts/child (range 1-10).

110 children always interacted with mom, 5 with dad, 33 with mom or dad, and 5 with mom or another person (facilitator, sister, boyfriend)

Measures

Dependent Measure: TNW

Predictor Variables:

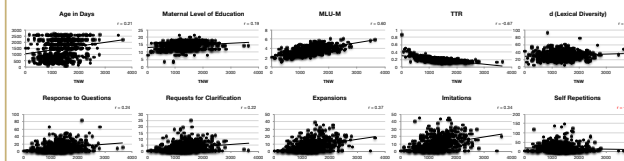
Demographic – Age, MLE, Hearing Status (dummy: mild & moderate vs. severe, profound, & CI)

Syntactic – MLU-m

Lexical – TTR, d (Malvern et al., 2004)

Pragmatic – Response to Questions, Requests for Clarification, Expansions, Imitations, and Self-Repetitions

Results



1. Stepwise Regression

Step	Variable	R ²	β	uniq var
1	TTR	0.448	-0.630	0.176
2	MLU-M	0.664	0.382	0.060
3	d	0.707	0.274	0.034
4	Imitations	0.723	0.103	0.006
5	Self Repetitions	0.732	0.136	0.009
6	Expansions	0.736	0.084	0.004

Age, MLE, HearStat, RespQu and ReqClar did not enter the equation

Shared Variance = 0.447

2. Group Results

Is there a difference between sessions in which parents speak a lot vs. those in which they speak a little?

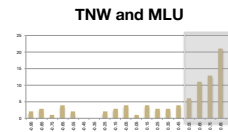
High ($z > 0.4$, $n = 202$), Med ($-0.4 < z < 0.4$, $n = 219$), Low ($z < -0.4$, $n = 211$)

High	R ²	β	Med	R ²	β	Low	R ²	β
TTR	0.190	-1.968	MLU	0.057		TTR	0.445	-0.824
d	0.897	1.657	SelfRep	0.156	-0.221	d	0.681	0.428
SelfRep	0.915	-0.163	TTR	0.188	-3.052	MLU	0.705	0.243
			d	0.828	2.880	Expans	0.713	0.098
			(MLU)	0.828		SelfRep	0.720	0.111

3. Individual Results

The previous analyses only show that quantity and quality in parental input are related. Does quality increase as quantity increases?

Examine child-parent dyads with at least 3 sessions to examine whether increases in input quantity cause increases in input quality.



102 children (92 moms, 8 dads, 2 moms & dads) = 104 parent-child dyads

Correlate TNW and MLU.

No effects due to MLE or Hearing Status

68/104 dyads (65.4%), $r > 0.50$

4. Does TNW affect child language?

Vble	R ²	β	Vble	R ²	β
Age	0.527	0.694	Age	0.527	0.414
Hearing	0.580	0.201	MLU	0.674	0.440
NTWa	0.603	0.130	RespQu	0.721	0.260
MLE	0.618	0.126	Expans	0.734	-0.174
			Imit	0.755	0.187
			Hearing	0.761	0.070
			NTW	0.766	-0.088
			d	0.769	0.059
			ReqClar	0.771	-0.080

A. Use adult quantity (and demographics) to predict child MLU

B. Use adult quantity and quality (and demographics) to predict child MLU

Conclusions

- Quantity and quality are related in parental input. Syntactic, lexical & pragmatic quality measures account for 73.6% of the variance in TNW.
- Parents who speak a lot use diverse vocabulary & are less likely to repeat themselves. For parents who speak a little, lexical & syntactic diversity also account for variance in TNW; but those parents are more likely to repeat themselves.
- For two-thirds of the children (who had multiple sessions), increasing the amount of input caused corresponding increases in the quality of that input. “Quantity is often a proxy for quality.” (Snow, quoted in Talbot, 2015)
- Input quantity predicted child MLU, though not as well as quality measures.

Caveats

No normal hearing control group. Input to CNH is greater in quantity and quality (Ambrose et al., 2015), which may affect correlations.

No longitudinal analysis (yet). While quantity of parental input stays constant over development, its quality increases over time (Huttenlocher et al., 1991)

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