

Relationships among quality and quantity of caregiver input and vocabulary size in 3-year-old children from diverse backgrounds

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BACKGROUND

Rationale

- How do we respond to the United State's most important public education problem, the **"achievement gap"**: a well-documented observation that children from low-socioeconomic status (SES) families perform less well academically than children from middle- and high-SES families (Loeb, 2007).
 - Compared with peers from more affluent families, children living in poverty hear approximately **30 million fewer words by age 3** (Hart & Risley, 1994)
- Research and intervention studies explore ways that we can help parents from low-SES families learn to talk more to their children—they focus primarily on increasing **quantity**. But what about **quality**?
 - Quality is also related to SES (Gilkerson & Richards, 2009)
 - Quality also predicts a child's later vocabulary skills (Rowe, 2012)
 - Increasing quantity of language through intervention measures doesn't necessarily increase pragmatic quality (Trask, 2012)

Purpose of this Study

- To explore the relationship between quantity and quality and how these interact with SES, in order to develop truly effective intervention programs that will result in vocabulary growth for children from low-SES families

Research Questions

- Does the relationship between quantity and quality of linguistic input differ as a function of SES?
- Is quantity or quality a better predictor of expressive vocabulary size, and does this relationship differ as a function of maternal education level?

METHODS

Participants

- 52 children who participated in a larger longitudinal study of language development
- Monolingual English speakers
- Aged between 28 and 38 months (mean = 32)
- Normal hearing and typical speech and language development

Table 1. Demographic information for participants

	Males/Females	AAE Speakers	Age	Primary Caregiver education	Family Income	EVT-2 Standard Score	PPVT-2 Standard Score
Low SES							
Middle SES							
High SES							

8-step scale for education:

- 1 = less than high school degree
- 2 = GED
- 3 = high school degree
- 4 = some college
- 5 = trade school
- 6 = technical/associates degree
- 7 = 4 year college degree
- 8 = graduate degree

5-step scale for family income:

- 1 = below \$20,000/year
- 2 = \$20,000 to \$40,000/year
- 3 = \$41,000 to \$60,000/year
- 4 = \$61,000 to \$100,000/year
- 5 = above \$100,000/year

Measures

- % Adult Meaningful Speech
- Adult Word Count (Hourly)
- % Contingent Speech: topic-continuing replies (Hoff, 2006)
- % Decontextualized Speech: language that does not refer to the here and now. Include abstract explanations, pretend play, and narratives. (Rowe, 2012)
- % Open-ended questions: as opposed to closed-ended and Yes/No questions (Trask, 2012)
- % of Commands
 - % Indirect commands
 - % Prohibitions
- % Negative Feedback: negative comments and prohibitions (Trask, 2012)
- % Expansions: adds linguistic content to increase syntactic or semantic complexity to the child's utterance (Trask, 2012)

PROCEDURE & ANALYSIS

Procedure



The Language Environment Analysis System (LENA) is a small digital language processor that is placed in a specially designed vest and unobtrusively records 16 hours of a child's natural language environment.

- Orthographically transcribe 30-minutes from each participant's language sample, using the Computerized Language Analysis (CLAN) program, from the hour with the highest Conversational Turn Count (CTC)
- Code all child-directed speech for pragmatic measures of language quality using custom-made coding system

Analysis

Question 1:

- Stepwise linear regression analysis
- Dependent variable: linguistic quality (see *Measures*)
- Independent variables: SES

Question 2:

- Stepwise linear regression analysis
- Dependent variable: standard score on the EVT-2 and PPVT-2
- Independent variables: SES (level 1) and linguistic quality (level 2)

RESULTS

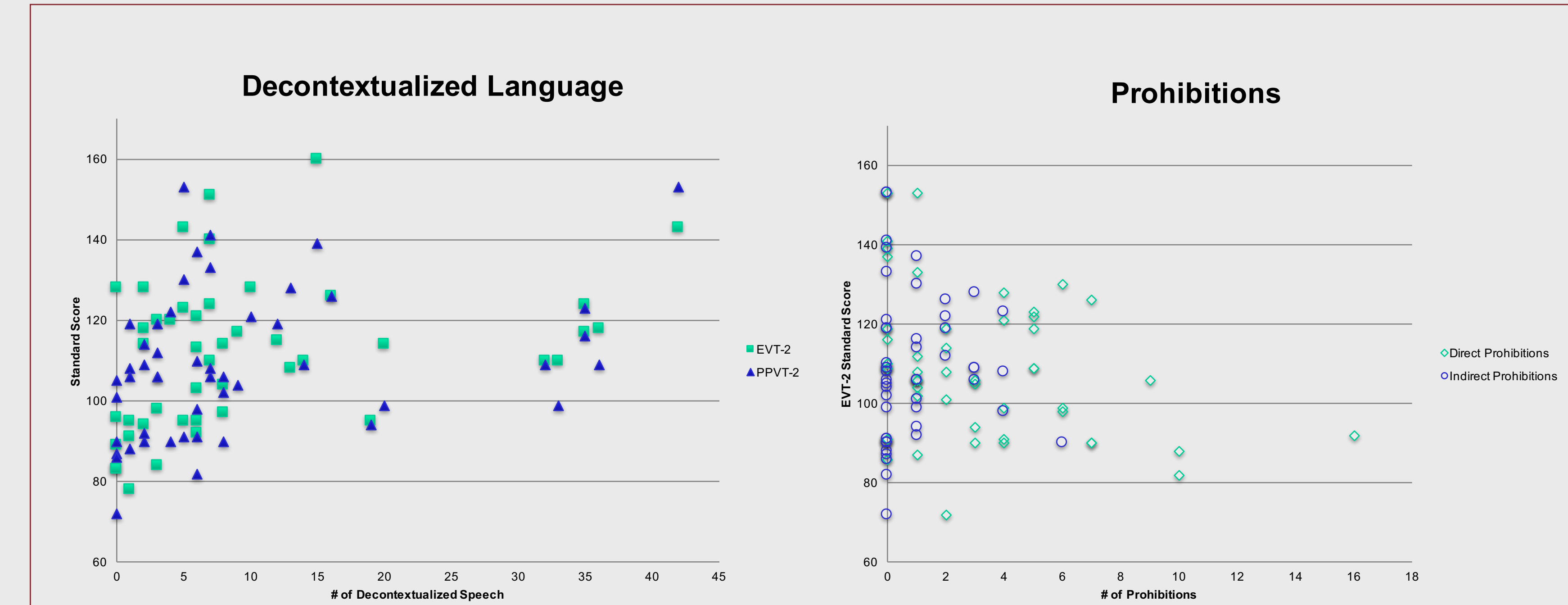
- Question 1:** A significant effect of SES on %meaningful speech, adult word count, %commands, %indirect commands, and %negative feedback was observed.
- Question 2:**
 - A significant difference in both EVT-2 and PPVT-2 scores between low and high SES was observed.
 - A significant effect of %decontextualized speech on EVT-2 and PPVT2 standard scores was observed.
 - A significant (negative) effect of %prohibitions on EVT-2 scores was observed.

EVT-2 Model Summary

Predictor	t - coeff.	Sig.	R-square
% Decontextualized	3.181	.003	.254
% Prohibition	-2.321	.025	.254

PPVT-2 Model Summary

Predictor	t - coeff	Sig.	R-square
% Decontextualized	2.736	.009	.148



Examples

Participant 666L

881 *MOT-CHI: George got up on the wall to find out what it was .
 882 %spa: \$BPS
 883 *MOT-CHI: **monkeys are good at climbing aren't they** [=! not bps] ?
 884 %spa: \$CDS:CTG:No:CTX:No:CMT:Neu
 885 *CHI: &uhhuh .

Participant 685L

638 *CHI: yyy !
 639 %pho: /dæʔɪbəkʌp/
 640 *FAT-CHI: that is a cup .
 641 %spa: \$CDS:CTG:Yes:CTX:Yes:CMT:Pos:Exp
 642 *FAT-CHI: **I use that to &um move the paint from one thing to another .**
 644 %spa: \$CDS:CTG:NA:CTX:No:CMT:Neu
 645 *FAT-CHI: just leave it there .
 646 %spa: \$CDS:CTG:NA:CTX:Yes:CMD:Cdo:Dir
 647 *FAT-CHI: it's full of paint .
 648 %spa: \$CDS:CTG:NA:CTX:Yes:CMT:Neu
 649 *FAT-CHI: **I don't want you touching anything back here okay ?**
 650 %spa: \$CDS:CTG:NA:CTX:Yes:CMD:Pro:Ind

DISCUSSION

Limitations of study:

- Incomplete number of age and gender high-SES matches
- Inter-rater reliability yet to be calculated

Conclusions:

Question 1: Children from high SES families tend to hear more meaningful speech and adult words compared to their peers from low SES families. They also receive language input of higher quality, meaning they hear less commands and less negative feedback, and more indirect commands as opposed to direct commands.

Question 2:

- Children from high SES families perform better on standardized tests of expressive and receptive vocabulary measures compared to their peers from low SES families.
- Across all SES levels, the amount of decontextualized speech that a child hears is a significant predictor of their performance on standardized tests of expressive and receptive vocabulary. This suggests that intervention programs may benefit from teaching parents to use more decontextualized language with their children.
- Across all SES levels, the amount of prohibitions that a child hears is a significant predictor of their performance on standardized tests of expressive vocabulary. The more prohibitions a child hears, the lower their EVT-2 score. This suggests that it is useful for intervention programs to teach parents strategies to limit the use of prohibiting language.