

Fathers' and mothers' differential talk to sons and daughters with hearing loss

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Background

Children's early language development is shaped by linguistic input. For children who are typically developing (TD), increased exposure to linguistic input is associated with positive linguistic outcomes.^{7,8,9}

Much attention has been given to the mother-child dyad, finding that children of more voluble mothers exhibit stronger vocabulary growth and faster lexical processing than children of less voluble mothers.^{7,8} Mothers have also been shown to talk more with daughters than with sons, and fathers have been shown to talk less to children overall than mothers do.^{2,3,4,6}

Recent work has also shown that conversational exchanges may be an important indicator of development and learning. Children who engage in more conversational exchanges, after controlling for raw volubility, have been shown to have better outcomes than children with fewer conversational interactions.¹⁴

The impact of volubility and conversational exchanges has also been explored in children who are hard-of-hearing (HH) or have a hearing loss.^{10,11,12,13} In HH children, increased receptive and expressive language skills have been associated with adult volubility, child volubility, and conversational turns.¹

There is no known literature on the role of fathers' volubility and conversational exchange rates with HH children.

Method

PARTICIPANTS

370 total recordings from 44 families. Recording duration mean is 10.3 hrs.

20 male children

- 10 TD sons (age $M=33.5$ mos, $SD=8.6$ mos), 70 recordings
- 10 HH sons (age $M=34.9$ mos, $SD=8.5$), 82 recordings

24 female children

- 7 TD daughters (age $M=25.7$ mos, $SD=11.2$); 64 recordings
- 17 HH daughters (age $M=25.7$ mos, $SD=9.8$); 154 recordings

MATERIALS

With the LENA system we collected naturalistic, whole-day acoustic recordings and performed automated analyses of the acoustic environment. This technology provides estimates of, among other things, (1) duration of all utterances spoken near the child by adult females, adult males, and other children ("maternal talk," "paternal talk," and "sibling talk") (2) estimates of conversational exchanges between the child and an adult ("conversational turns"), and (3) duration of sound from electronic media present in the environment, including sound from radio, video games, toys, and television.

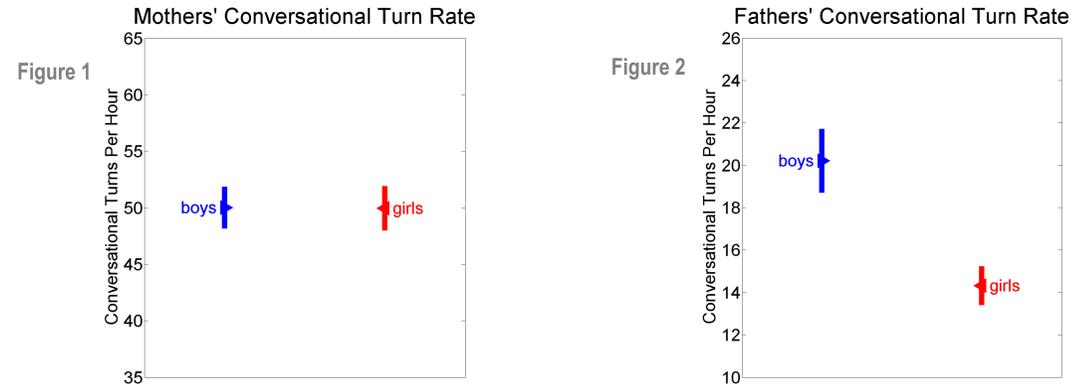


PROCEDURE

Daylong recordings were collected. LENA software estimated the number of words spoken in each clear adult segment and each speech or speech-like word spoken in each child segment. A **conversational turn** is operationalized as adjacent syllables spoken by a child and an adult. Total conversational turns between each dyad were divided by the total length of the recording to obtain **average conversational turns per hour per recording**.

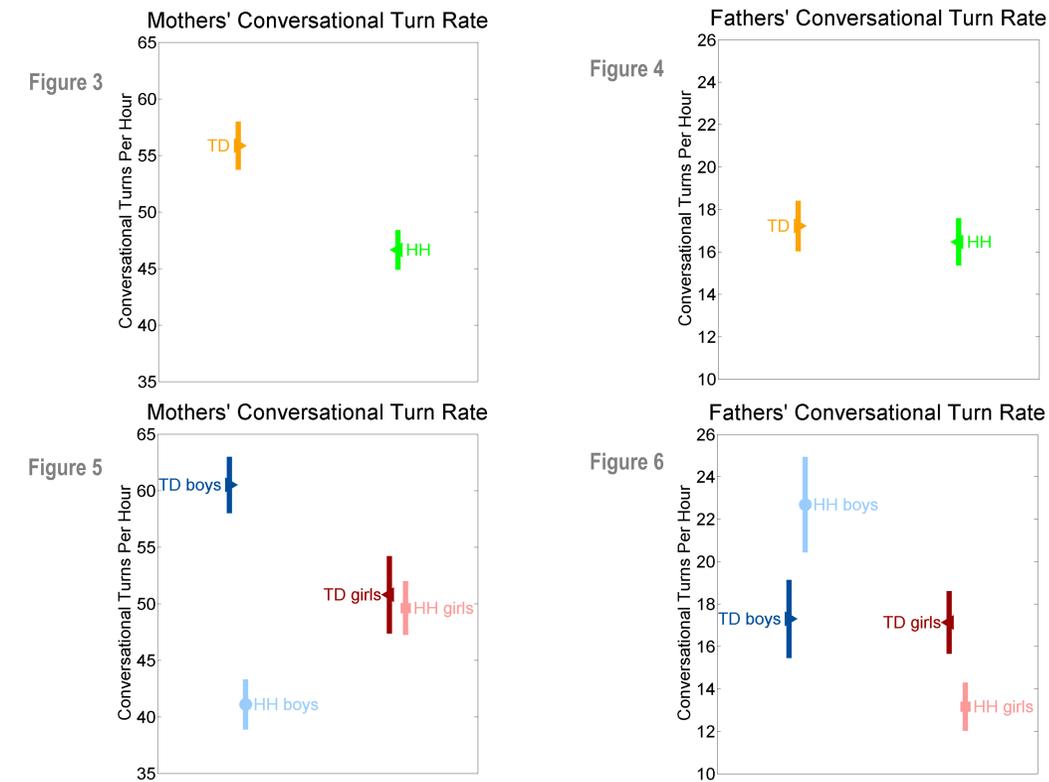
Results

1) Do mothers' and fathers' conversational exchange rates vary by the sex of the child?



Figures 1 and 2 show the normalized rates of conversational exchanges between parents and children. Error bars are the estimates of the 95% confidence intervals about the mean for each group. Figure 1 shows that mothers engage in the same number of conversational exchanges per hour, about 50, with their **sons** and with their **daughters**. Figure 2 shows that fathers engage in more conversational exchanges per hour with their **sons**, about 20, than with their **daughters**, about 14.

2) Does child hearing status impact conversational exchange rate of mothers and fathers?



Figures 3 and 4 show the normalized rates of conversational exchanges between parents and their children with regard to hearing status for **typically developing (TD)** and **hard of hearing (HH)**. Error bars are 95% confidence intervals. Figure 3 shows that mothers engage in about 56 conversational exchanges per hour with their **TD children** and 47 exchanges with their **HH children**. Figure 4 shows that fathers engage in about 17 exchanges per hour with their **TD children** and 16 exchanges per hour with their **HH children**.

Figures 5 and 6 show the rates of conversational exchanges between parents and their children with regard to both hearing status and sex of the child. Error bars are 95% confidence intervals. Figure 5 shows that mothers engage in about 51 conversational exchanges per hour with their **TD daughters**, about 50 exchanges per hour with their **HH daughters**, about 60 exchanges per hour with their **TD sons**, and about 41 exchanges per hour with their **HH sons**. Figure 6 shows that fathers engage in about 17 exchanges per hour with their **TD daughters**, about 13 exchanges per hour with their **HH daughters**, about 17 exchanges per hour with their **TD sons**, and about 23 exchanges per hour with their **HH sons**.

Results

The present study shows that fathers converse more with their sons than their daughters (Figure 2), but sex of the child does not appear to influence the conversation rates of mothers (Figure 1).

Mothers converse more with **TD children** than with **HH children** (Figure 3). The difference in exchange rates between mothers and their children based on hearing status seems to be driven by the interaction effect of moms conversing more with **TD sons** than with any other group (Figure 5). With fathers, however, there is no main effect of hearing status (Figure 4). Hearing status does not impact the conversational exchange rates of fathers with their children overall, but there does appear to be an interaction between child sex and hearing loss: fathers converse more with their **HH sons** than any other group while at the same time less with their **HH daughters** than any other group (Figure 6).

Discussion

Previous studies have demonstrated that HH children require greater linguistic input than their TD peers to experience language in a similar way.^{10,11,12,13} Vygotsky's **Apprenticeship Model** proposes the parent acts as a "master" of a skill, teaching that skill to the child "apprentice." This model suggests that adults scaffold children's early interactions while promoting the cognitive development of their children. It also suggests that children's development likely occurs during joint activities or problem solving tasks with language "masters," namely their mothers and fathers.^{5,14}

The present study shows that mothers and fathers talk differently to each group of children characterized by sex and hearing status. Perhaps mothers and fathers have different intentions and methods of teaching and scaffolding their "apprentices," their TD and HH sons and daughters.

Future Directions

1. Replicate the present study with a larger sample size to validate these results.
2. Examine the participants' language skills (e.g. receptive and expressive language scores) to further assess effects of conversational exchanges with mothers and fathers.
3. Examine demographic effects on exposure to conversational exchanges (e.g., number of participant siblings, socioeconomic status, ethnicity, older or younger target children).
4. Examine characteristics of hearing loss (e.g. severity, configuration) and its effects on conversational exchange rate.

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For raw data and to download the acoustic WAV files, see <http://homebank.talkbank.org/>