EFFECTS OF PARENT TRAINING WITH CHILDREN WHO ARE LATE TALKERS

by

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EFFECTS OF PARENT TRAINING WITH CHILDREN WHO ARE LATE TALKERS

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ABSTRACT

The purpose of this study was to evaluate how (a) directly training a mother on language stimulation techniques affects the mothers’ language input behaviors, (b) directly training a father on language stimulation techniques affects mothers’ language input behaviors, and (c) how directly training mothers and fathers changes a late-talking child’s vocabulary growth rate and expressive vocabulary usage. A 38-month-old late-talking child and both of his parents participated in a 10-week intervention involving parent training on language stimulation. The primary dependent variable was strategy implementation measured through analyzing bi-weekly video play sessions. The secondary dependent variable was the child’s expressive language measured by mean length of utterance (MLU), number of words used in play, adult word count and number of child vocalizations. Findings revealed a change in trend in the mother’s implementation of language strategies directly taught to her. There was not a functional relationship between training the father on language input strategies and the mother’s behavior. The child’s MLU, number of words used in play, and number of conversational turns all increased throughout the study. Although further research in family dynamics and parent training is needed, the findings suggest that parent training is an effective type of therapy to increase the expressive language of late talkers.
Introduction

Parent training is an increasingly recommended intervention for children with communication disorders (Roberts & Kaiser, 2011). The form that parent training takes, however, can vary widely between cases. Further, the research literature does not give a clear indication of how parent training affects the overall family dynamic (e.g., how training a mother can influence father-child interactions). The purpose of this study was to evaluate how parent training affected the communication behaviors of a mother, a father, and a late-talking child.

Characteristics of Late Talking Children

The majority of children without diagnosed disabilities develop at least a 50-word vocabulary by the age of two. There is, however, a subset of children who do not meet this milestone, despite having normal receptive vocabulary development and normal nonverbal cognitive abilities (Recorla, 1989). These children have been commonly labeled “late talkers” (e.g., Rescorla, Mirak, & Singh, 2000). In other words, late talkers understand language on a level that is equal to their peers, however they do not use words to communicate their needs. These children have received various diagnostic labels including: late talkers (Paul et al. 1991), early expressive language delay (Whitehurst et al. 1991), specific expressive language impairment (SLI-E) (Rescorla and Gossens 1992), and children with late language emergence (LLE) (Zubrick et al. 2007). A study conducted by Rescorla in 2009 presented the findings that late-talking children are likely to exhibit a weaker endowment for language acquisition, which can lead to diminished linguistic performance relative to peers (Cable, 2011).

Intervention for Late Talkers
Parents are widely recognized as a child’s first teacher of language. Even for children with communication disorders, a parent spends more time with their child than a therapist. Parent-child interaction has been proven to make a significant impact on child language development from a young age. Tomasello and Todd (1983) reported that normally developing children whose mothers engaged in greater amounts of joint interaction had larger expressive vocabularies between 12 and 18 months of age than children whose mothers engaged in less joint interaction.

A multitude of single subject and group design studies have demonstrated the effectiveness of parent training in altering parent use of language intervention strategies, and child language skills. Hemmeter and Kaiser (1994) taught four parents four language intervention strategies to use with their children with developmental delays 25-49 months old. In this study, parent training resulted in positive changes in parental use of all language intervention strategies for each parent. Roberts and Kaiser (2011), in a meta-analysis, indicated that parent-implemented intervention had positive, statistically significant effects on receptive and expressive language skills, receptive and expressive vocabulary, expressive morphosyntax, and rate of communication for children with communication impairments when compared to clinician-implemented intervention.

Current recommendations for clinical treatment of late talkers range from “watch and see” method (Paul 1996), to parent-training involving focused stimulation and modeling of single words, imitation of single words, and traditional individual speech-therapy, and parent-training (Cable 2011). Rhea Paul wrote in her 1996 study that 74% of late talking children in her study following the watch and see method scored within normal range for expressive language skills as measured by the DSS by the time they
reached kindergarten. The watch and see method entails actively monitoring a child’s language progression, ensuring language is the only deficit, and assessing intelligibility at different milestones whenever the child is between 2-5 years of age. The Hanen program is the most well-known of the parent training methods involving focused stimulation and modeling of single words. Traditional speech-therapy has been recommended for late talkers however, Byrne (2000) reported in her study comparing the effectiveness of parent training in comparison to therapy with the clinician alone found the least effective therapy modality involved the clinician alone. Parents can provide more opportunities than the professional for the child to experience the language target.

A body of evidence supports, in particular, the use of parent training to change parent input to late talkers to improve expressive output. Girolametto (1997) found that late talking children whose parents target specific words have improved phonological ability compared to their late talking peers. Tannock and Girolametto (1992) present the idea that there is an ‘idiosyncratic feedback cycle’ during parent-child interactions in which the toddler’s language delay influences the parents and vice versa. They propose that the toddler’s language delay influences the parent to provide less than ideal input as the parents try to compensate for the child’s deficits. Parent’s interactive techniques used with late talkers could be compounding a child’s difficulties and are not optimal for language acquisition (Tannock and Girolametto, 1992).

**The Family as a Dynamic System**

Families are unique and complex systems. Hence, parent training is likely to affect a family system and communication patterns in complex ways. Parents affect each other in many ways, including the way that they interact with their children. Cox and
Paley (2003) cite that marital and parent-child relationships are interrelated. “The family is a system” writes David M. Luterman in *Counseling Persons with Communication Disorders and Their Families*, and “every member affects every other component of a family” (Luterman, 147). Girolametta, Greenberg and Manolson (1986) described the Hanen Early Language parent program aimed for developing parent’s dialogue skills with their children. This study followed 11 mother-child dyads and showed significant adjustments to the mother’s conversational style that facilitated greater responsiveness from her child.

Early intervention that includes parent-training, recommended treatment approaches for late-talking children, has a strongly established foundation in the research literature. However, certain details of parent training, such as how training mothers affects fathers’ behaviors and vice versa, remain unexplored. Because families are dynamic systems wherein both mothers and fathers interact with children and each other, the effects of parent training should be considered with regard to each member of the system. The purpose of this study was to evaluate how (a) directly training a mother on language stimulation techniques affects the mothers’ language input behaviors, (b) directly training a father on language stimulation techniques affects mothers’ language input behaviors, and (c) how directly training mothers and fathers changes a late-talking child’s vocabulary growth rate and expressive vocabulary usage.
Methods Section

I. Participants:

In this single subject, multiple baseline across behaviors study, a 3 year, 2 month old child, hereafter called Adam, who is a late talker and his parents participated in parent-child intervention over a period of ten weeks.

Adam had normal hearing acuity as confirmed by a hearing screening. He participated in the Communication and Symbolic Behavior Scales and Test of Early Language Development, and MacArthur-Bates Communicative Development Inventory assessments. On the CSBS, he scored above the 50th percentile for Communicative Function, Communicative Means Gestures, and Reciprocity, but below the 10th Percentile for Communicative Means Vocalizations and Verbalizations. This indicates that Adam demonstrated normal use of gesture and function to communicate his wants and needs, but delayed production of sounds and words as compared to children of his same age. The Test of Early Language Development confirmed that Adam demonstrated receptive language skills within the range of normal (standard score of 96). The MacArthur-Bates Communicative Development Inventory placed Adam’s expressive knowledge of words in the 14th percentile, again indicating expressive delay.

Adam’s mother and father were 31 years old at the time of the study. Both had received college degrees and both had been diagnosed with dyslexia as children. Both Adam’s mother and father reported no hearing or other learning difficulties, and both
reported working outside of the home. Adam spent time while his parents were working in a daycare center, but spent evenings and all weekend days with both of his parents.

II. Apparatus and materials:

In this single-subject design, the mother-child or father-child dyad participated in parent training intervention sessions and a probe assessment weekly. Interventions lasted approximately 45 minutes and were followed with a 15-minute video recording. Parents were also given equipment and asked to record a play session one time at home each week. Probe play sessions were coded for all strategy behaviors at each session and each home play sample.

*Probe assessments.* Probe assessments measured language-facilitation strategy use and expressive words used by child followed the same procedures across all conditions. During a probe assessment, the parent-child dyad was asked to play with a standard set of toys. Parents were instructed, “Play as you normally would in your home.” The sample of play was video-recorded for ten minutes.

During the probe assessment session, parents were also asked to complete the MacArthur-Bates Communicative Development Inventory for their child. During the first session, this task took approximately 20 minutes. In following probes, the parents only marked new words understood or produced by their child: thus, inventory completion took a shorter period of time.
To collect additional generalization data about the amount of communication occurring at home, the participant was also given a LENA system device (Language Analysis Environment; e.g., Yoshinaga-Itano & Gilkerson, 2010) to wear one day during the week and a paper schedule to fill out indicating the times that the mother was with the child during the day. Using the LENA, the first author was able to analyze the number of conversational turns taken by the child daily and the amount of input given to the child (e.g., number of words) each day during the various conditions.

*Probe assessment analysis*. Mother-child and father-child play sessions were coded for use of each of the strategies. Language stimulation strategies included transparent labeling, linguistic mapping, follow in labeling, wait time, and open ended questions. All sessions were coded using repeated observations of videotaped sessions. A coding manual was developed to train observers to identify strategy use and opportunities for strategy use in the play videos (attached as Appendix X). Observers were trained to at least 90% summary-level reliability before coding or transcribing data.

Mother-child and father-child play sessions were also coded for number of different words spoken by the child and the MacAurthur Bates Communicative Development Inventory data was analyzed.

*Reliability*. An independent observer collected agreement data for approximately 1/3 of the probe assessments recorded across each of the conditions. Agreement data will be collected across all participants.
III. Procedure:

A single subject, multiple baseline design across behaviors was used to measure the effects of parent training on mother’s use of transparent labeling, linguistic mapping, follow in labeling, wait time, and open ended questions and subsequent effects on expressive vocabulary growth in children who are late talkers. This single subject method is intended to measure a relationship between an independent variable (the training) and dependent variable (maternal strategy use and number of words produced by children) (Horner & Baer, 1978). The multiple baseline design was preferred over other single subject designs because the strategy use and vocabulary growth are learned rather than reversible behaviors because the training is not likely to transfer to use of other language-stimulation strategies or to language learning behaviors equivalent to vocabulary knowledge. To implement this study design, the investigators assumed that the dependent variable (strategy use and rate of vocabulary growth) would respond the same way to independent variable (training) and that change in one mother’s performance with one strategy will not affect the performance of the mother’s performance with other strategies. This design is appropriate to address the specific aims posed and to control for anticipated threats to internal validity by altering the length of baseline across behaviors.

Participants were involved in this study for 10 weekly sessions conducted at the Miller Speech and Hearing clinic or participant’s home. Sixty minute sessions were conducted weekly. Baseline conditions were obtained through a parent play recording that was
assessed by an observer and coded for use of language stimulation strategies with the
toddler.

During the intervention condition each parent-child dyad participated in parent training
intervention sessions and a probe assessment weekly. Interventions lasted approximately
45 minutes and were followed with a 15-minute video recording.

During the 45-minute parent training sessions, mothers were taught to use strategies
using a protocol currently being validated in the faculty supervisor’s lab. During the first
session, each strategy was defined, the therapist provided a rationale for the strategy,
described how the strategy is used, and answered parent questions about the strategies.
Following this introduction, the therapist modeled the strategy with the child for
approximately 10 minutes, and then the parent practiced the strategy with his or her child
and coaching from the therapist using a new set of toys. Finally, the therapist provided
feedback to the parent and answer parent questions.

After a stable baseline was obtained, the dyad entered training for the first (randomly
selected) language stimulation strategy. When the parent mastered use of that strategy
(i.e., used the strategy spontaneously on 80% of opportunities presented in a probe play
sample), the therapist began parent training on the next randomly selected strategy. This
procedure continued until all strategies were targeted. Probe play sessions were coded for
all strategy behaviors at each session. Language stimulation strategies were taught in the
following order:
Results:

This study investigated the existence of a functional relationship between (a) directly training a mother on language stimulation techniques and the mothers’ language input behaviors, (b) directly training a father on language stimulation techniques and the mothers’ language input behaviors, and (c) a late-talking child’s vocabulary growth rate and expressive vocabulary usage in relation to parent training. The participants engaged in three baseline sessions and 10 language stimulation training sessions.

Functional relationships were determined via visual analysis. Two graduate students trained in single-subject design, but naïve to the purpose of the study, were asked to examine each graph and determine whether a functional relationship existed between the onset of intervention and the dependent variable. The author only concluded that a functional relationship existed when the two observers were in agreement that there was a functional relationship present.

Mother-Taught Strategies:

<table>
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<tr>
<th>Schedule of Intervention</th>
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<tbody>
<tr>
<td>Week 1</td>
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<td>Week 2</td>
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<td>Week 3</td>
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<td>Week 4</td>
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<td>Week 5</td>
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Red = Session with Mom  Blue = Session with Dad
Figure 1 displays the mother’s use of language stimulation strategies in relation to the beginning of each mother-taught strategy intervention. The mother started to use more open ended questions after the introduction of open ended question intervention. Discrepent labeling decreased and transparent labeling increased at the introduction of transparent labeling. These graphs show a functional relationship between teaching mom language intervention strategies and her employing the strategies in play.

Figure 1. Maternal use of mother taught strategies in play

Father Taught Strategies:

Figure 2 represents maternal use of strategies taught to the father. There is no functional relationship between the beginning of strategy intervention with dad and mom’s use of the strategy in play. Because parents can spend much more time with their children than a therapist could, it is important to investigate the most effective way to train parents to
use language stimulation strategies at home. It would be favorable if training one parent would transfer to the other care takers. The findings of this one study reflect that parent training information does not necessarily transfer between parents.

**Figure 2.** Maternal use of father taught strategies in play

**Child Expressive Language:**

Figure 3 displays changes in the expressive language of a late talking child through the measure of number of verbal utterances in play and the child’s mean length of utterance. Over the course of therapy Adam’s use expressive language increased. Both his number of verbal utterances and MLU increased from baseline. This study represents a relationship between parent training with language stimulation strategies and the expressive language use of a late talking child. However, because these child behaviors
were collected as descriptive information, no conclusions can be drawn about functional relationships.

**LENA Data:**
A LENA (Language Environment Analysis) device was used to collect quantitative data on the quantity of language Adam was hearing in a given day. The LENA Device was used five times over the ten-week study and recorded the amount of adult language input and the number of conversational turns the child had throughout a day. Figure 4 displays the adult word and child vocalization count for each of the five days LENA data was collected. The LENA data reveals a functional relationship for both

**Figure 3. Child Expressive Language**

**LENA Data:**
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adult word count and child vocalization count as the parent training therapy progressed. The language stimulation strategies taught to parent-child dyads targeted the quality of language a child was hearing, however, the quantity of language the child was exposed to also increased.

Figure 4  LENA Data

**Discussion:**
This purpose of this study was to investigate the existence of a functional relationship between (a) directly training a mother on language stimulation techniques and the mothers’ language input behaviors, (b) directly training a father on language stimulation techniques and the mothers’ language input behaviors, and (c) a late-talking
child’s vocabulary growth rate and expressive vocabulary usage in relation to parent training. This investigation has high ecological validity: parent training was implemented in multiple settings with more than one parent on a family-centered schedule. For late talking children, this study reveals a relationship between training one parent and that parent’s use of language strategies to improve child’s expressive language. However, this study does not show a functional relationship between training one parent and increasing the use of language stimulation strategies in the other parent.

Adam exhibited characteristics of a late talker consistent with the literature (Recorla, 1989; Rescorla, Mirak, & Singh, 2000) including typical cognitive development and receptive understanding, and decreased expressive language use. Also consistent with Hemmeter and Kaiser (1994), directly training the mother did influence the mother’s behavior across use of open-ended questions, discrepant labeling, and transparent labeling. This positive result is therefore, not unexpected: parent training is most likely successful because parent behavior is malleable.

Directly training the father, however, did not carry over to the mother’s behavior within this study. This finding is important because it potentially adds information to what is known about parent training. Ideally, given that the family is a dynamic system and affecting change in one area should contribute to change in another (Cox & Paley, 2003), training a father would also change the mothers’ behavior. Because two-parent families often share child-care responsibilities, particularly if both parents work outside of the home, it is likely that more than one parent will bring a child to an intervention session over the course of that child’s treatment. If the recommended treatment for a child is parent training, interventionists must consider whether training one parent can
carry over to the behavior of the other parent. This study indicates that an interventionist must consider the skills of the father and mother separately, rather than assuming a single training with one parent will generalize to the behavior of the other parent, even in families who indicate that they share information at home, as was the case in the family who participated in this study.

As was the case in the studies of Girolametto (1997), Tannock and Giralametto (1992), and Byrne (2000), increase in parent strategy use seemed to increase the late-talking child’s expressive language. Adam’s improvements in expressive language development were somewhat faster than predicted by his baseline behavior. These findings are consistent with Girolametta, Greenberg and Manolson (1986) study where maternal training altered mother’s conversational style and increased child responsiveness. However, we cannot indicate with certainty that the intervention caused this language growth, given the parameters of this design. It is possible that Adam’s language growth may also be attributable to expected development of a child of this age. More research would be necessary to confirm that the level of growth observed was absolutely related to the intervention.

**Limitations and Future Directions**

Some limitations constrain conclusions that can be drawn while interpreting results of this study. Because a single-subject methodology was used to answer research questions, the results can only be generalized to other 3-year old late talking children who fit the profile of the participant in this study. A next step in this type of research could be to use a group design to draw further conclusions about the effectiveness of parent training with late talking children.
This study adds to the limited evidence base for the effectiveness of parent training with late talking children and the family dynamics involved with parent training. Further investigation in the family dynamics of parent training should be conducted to test the effects of maternal training on paternal use of language stimulation strategies. Further research should investigate how information taught in parent training sessions is shared between parents. The reality of providing speech and language therapy is that multiple people end up bringing a child to therapy in order to accommodate a family’s hectic schedule. What clinicians potentially need to assume is that training one parent does not necessarily transfer to changing the behaviors of the other parent. Future work needs to be done to investigate how to best train parents to serve as teachers of language to late talking children.
References:


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