MODIFYING MOTHERS’ ‘INPUT’ LANGUAGE AS A VEHICLE FOR LANGUAGE REMEDIATION

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Abstract
This study aims to stimulate language in impaired (LI) children by modifying their mothers’ speech to them. There were 8 mother/LI child dyads. Each pair was video taped at baseline during joint interaction. A toy house, dolls, and car facilitated play. Mothers were trained to align their input language to language enhancing strategies. One year later, the participants were re-evaluated. The results adduced that the 5 mothers who completed training had significantly adjusted their speech in line with the training objectives. There was a corresponding improvement in their children’s speech. Three mothers who defaulted from training produced limited speech adjustments. Their children’s speech showed no improvement at reassessment. This suggests that without formal therapy, appropriate input language facilitates language acquisition in LI children.

Key words – Mothers’ speech; language intervention/therapy; Nigeria.

Introduction
The prevalence of developmental disabilities in children below the age of 18 is cited at approximately 15% in the United States or 1 in 6.6 children (Boyle et al, 2011). A large proportion of these tend to exhibit cognitive challenges which include delays in the acquisition of language (Johnson, 2007). The incidence of language disorders in African children is unknown and professional resources limited. The African continent suffers from a dearth of speech and language pathologists. Nigeria boasts just a handful causing many impaired children to lack language intervention services (Yul-Ifode et al, 2011; Abiodun et al, 2012). The need arises to explore non-professional avenues for stimulating language in delayed children. Some parent-based intervention packages have proven remarkably effective in managing various aspects of learning in children (McDade 1981; Snow 1984; Tompkins & Jeffrey 2011 & Chang et al, 2011).

A body of research suggests that parents’ interactive style with language learning children may modify that process hence providing a vehicle for language acquisition (Lee et al, 2010). Certain aspects of parental conversation with such children appear to correlate positively with rapid language acquisition. They include the following features: - parental ability to decipher and respond to their child’s communicative intent; a tendency to verbally encode their child’s line of regard; the simplified use of syntax; encouraging turn taking within dialogue and the use of an interrogative mode of communication. On the other hand, a slower rate of language learning in children seems to be related to an authoritarian parental communicative style; the use of intrusive language not relevant to context; insensitivity to child’s pre-linguistic attempts at communication; sudden shifts in topic and a high frequency of verbal disapproval (Brown 1973; Nwanze 1997; Larkina & Bauer 2010).
The present pilot study attempts to stimulate language production in impaired children by modifying their mothers’ linguistic input. The mothers were trained to adjust their speech in line with suggested parental language enhancers.

Method

Participants
The study had 16 subjects: 8 mothers with their 8 Language impaired (LI) children. Three mothers and LI children who failed to attend the training programme were reassessed at the end of the project to contrast their performance with the trained group. Hence five LI dyads were trained and reassessed. Three dyads were not trained but were also reassessed. None of the children showed physical or sensory handicaps. They were all audiometrically evaluated and had normal hearing. All had a history of a neurological insult. None had received any previous speech therapy.

Procedure
Baseline and reassessment behaviour was obtained as follows:
Two, 5 minute video recording’s set one week apart, were made of each mother-child pair playing with a standard set of toys. These included a doll’s house, four dolls, doll house furniture, car and playground. The instruction given to each mother was ‘play with your child; you may use these toys if you wish’. The mother’s were initially informed that we wished to observe how their child plays. The above mentioned procedure was repeated one year after a training programme had been concluded. Following this, parents were debriefed as to the true purpose of the study.

Experimenter design
The A: B: A: design was adopted with ‘A’ as the pre-test; ‘B’ the treatment and ‘A’ repeated again as the post test. Hence each participant acted as their own control. The study schedule was as follows:
Pretest: Data drawn from the first set of 10 minute video recordings of mother-child interaction.
Mothers’ Treatment: Six training sessions were held once a week for 6 weeks. Their purpose was to teach mothers to adjust specific aspects of their mode of interaction with the LI children.
Children’s Treatment: Mothers were instructed to adopt for one year, this modified mode of communication with their LI child during their day-to-day interaction within the natural environment of the home.
Post-Test: After the completion of the above, a second set of two, 5 minute, video recordings, set one week apart, were repeated of each mother-child pair, playing with the same toys as in the pretest. The extraction and coding of the data from the tapes, was identical to methods applied on the pre-test.

Video tape analysis
The tapes were analyzed for the syntactic and semantic complexity used in mother and child speech. The responsiveness of mother to child’s communication and mother’s elocutionary force. Mean length of utterance (MLU) is a standard measure of child language as well as language spoken to children (Brown 1973) this was computed for each mother and child. The suggested order of development of semantic notions in children’s speech is listed in Appendix 1 (Leonard 1984) each was given a numerical value from which a semantic score (SS) was obtained as follows, the value of the total number of semantic notions was divided by the total number of utterance units (UU) made during the ten minutes segment of speech un-broken by a pause of 1 minute or longer. The type-token ratio (TTR) measures redundancy in speech a percentage was calculated by dividing the total number of new words by the total number of words used in the 10 minute segment of speech. A communicative score (CS) reflected the percentage of child’s attempts at communication to which mother responded. Appendix 2 lists the categories of speech into which mothers’ elocutionary force was divided. Two independent raters coded mothers’ speech into
the various categories. The inter-rater reliability was computed using the spearman Rank correlation coefficient. For CS was 0.96 and 0.92 for elocutionary force. Inter tape reliability was 0.835. The data was analysed non-parametrically.

Results

A. Mothers’ speech

Table 1: Mothers’ Linguistic Scores at Baseline and Reassessment

<table>
<thead>
<tr>
<th></th>
<th>TRAINED BEFORE</th>
<th>TRAINED AFTER</th>
<th>UNTRAINED BEFORE</th>
<th>UNTRAINED AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>2.25</td>
<td>4.564*</td>
<td>2.6</td>
<td>3.0</td>
</tr>
<tr>
<td>MLU</td>
<td>7.374</td>
<td>7.554*</td>
<td>8.26</td>
<td>8</td>
</tr>
<tr>
<td>SS</td>
<td>39%</td>
<td>35.8%</td>
<td>29.7%</td>
<td>30.75%</td>
</tr>
<tr>
<td>TTR</td>
<td>29.6%</td>
<td>78% *</td>
<td>20.0%</td>
<td>19.5%</td>
</tr>
<tr>
<td>CS</td>
<td>224.4</td>
<td>212.4</td>
<td>149</td>
<td>213.5</td>
</tr>
</tbody>
</table>

n = 4; p < .03*

Table 1 shows that by the post-test, the trained mothers were speaking with a significantly longer MLU than they were, prior to the training. They were also far more communicative with their children at reassessment. The linguistic profile of the untrained mothers at reassessment was not significantly different from their baseline speech produced a year earlier.
The functional categories of untrained mother’s speech at baseline and reassessment are illustrated in the graph above. This contrasts quite sharply with the pattern of the trained mothers’ speech at baseline and reassessment. At reassessment the untrained mothers’ speech had not shifted in the direction of the training objectives. There was one exception which was for verbal approval. This increased slightly but consistently at reassessment (T = 14; N = 10; P < .025). Labeling of objects which had been discouraged during training, actually increased at reassessment in this group (T = 0; N = 10; P < .005).

Fig 2 illustrates the pattern of mother’s elocutionary force toward their children before and after training.

Table 2: The Numbers of Trained Mothers who adjusted their Elocutionary Force in the Direction of the Training objectives.

<table>
<thead>
<tr>
<th>FUNCTIONAL CATEGORIES</th>
<th>NUMBER OF MOTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAY INSTRUCTIONS</td>
<td>3/5**</td>
</tr>
<tr>
<td>DEMANDS GOOD BEHAVIOUR</td>
<td>4/5*</td>
</tr>
<tr>
<td>QUESTIONS</td>
<td>3/5**</td>
</tr>
<tr>
<td>ANSWERS</td>
<td>0/5</td>
</tr>
<tr>
<td>VERBAL APPROVAL</td>
<td>1/5</td>
</tr>
<tr>
<td>VERBAL DISAPPROVAL</td>
<td>4/5*</td>
</tr>
<tr>
<td>IMITATES CHILD</td>
<td>4/5*</td>
</tr>
<tr>
<td>MODELS CORRECT RESPONSE</td>
<td>4/5*</td>
</tr>
<tr>
<td>DESCRIBES ACTIVITY</td>
<td>4/5*</td>
</tr>
<tr>
<td>LABELS OBJECTS</td>
<td>3/5**</td>
</tr>
</tbody>
</table>

* U = 1; P < .008
** U = 3; P < .008

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In (8) eight of the categories a significant number of mothers shifted the thrust of their speech in the
direction of the therapy objectives by reassessment. The difference scores between baseline and
reassessment were significantly higher for trained than untrained mothers on descriptive speech and
imitation (U = 0, P < .03 respectively).

**B. Children’s speech**

**Table 3: Children’s Linguistic Performance at Baseline and Reassessment**

<table>
<thead>
<tr>
<th></th>
<th>TRAINED</th>
<th></th>
<th>UNTRAINED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BEFORE</td>
<td>AFTER</td>
<td>BEFORE</td>
<td>AFTER</td>
</tr>
<tr>
<td></td>
<td>MEAN</td>
<td>MEAN</td>
<td>MEAN</td>
<td>MEAN</td>
</tr>
<tr>
<td>MLU</td>
<td>0.55</td>
<td>1.825</td>
<td>0.55</td>
<td>0.95</td>
</tr>
<tr>
<td>SS</td>
<td>4.44</td>
<td>6.74*</td>
<td>4.06</td>
<td>4.00</td>
</tr>
<tr>
<td>UU</td>
<td>116</td>
<td>75.325</td>
<td>88.30</td>
<td>71.30</td>
</tr>
</tbody>
</table>

n = 4; p < .03

The children whose mothers received training showed a significant increase in their MLU and SS scores
at reassessment.
The Walsh test adduced a P of < .03 for MLU and SS respectively.
At reassessment, there was no improvement in the language development of children whose mothers were
not trained.
The Mann Whitney U test found that the post-test increase in MLU and SS scores were significantly
higher for trained than untrained children (u = 0, P < .03 respectively).

**Discussion**
The results of this pilot study illustrate an encouraging trend. They suggest that with minimal instruction,
parents are able to adjust and maintain enhancing interactive strategies across a 1 year period. Although
the sample size is small the indications are that a significant improvement in the experimental children’s
speech resulted from changes in their mother’s input - language. This conclusion may be adduced because
the speech of children in the untrained group had not significantly improved at reassessment. Untrained
mothers failed to amend most of their interaction strategies across the one year period.
These results lend support to research initiated in 1984 by Snow which suggests that some aspects of
maternal speech are utilized by children, during their language acquisition process (Teller 2001; Larkina
The results also hold some promise for developing countries like Nigeria where parents are faced with a
shortage of finances and particularly professionals (Asikhia 2011; Abiodun et al, 2012). Economic forces
dictate that in many Nigerian homes, both parents work hence, leisure time is very limited. The
intervention package designed above requires little financial outlay. Also of major advantage is that this
package is implemented within the existing communicative environment of the home, minimizing the
outlay of large amounts of time. This means that additional intervention time and the struggle to carry-
over words learned in isolation into the child’s spontaneous communicative repertoire is eliminated.
Parents often balk at the excessive amounts of time demanded to apply most home based programs (Robledo & Kucharski 2005). Far reaching conclusions may not be drawn from this preliminary investigation. It certainly gives rise to the need for further research.

References


Appendices

Appendix 1: Semantic Categories

1. Exclamation - ah, oh!
2. Protospeech - prelinguistic meaningful sounds such as peep for car horn or woof for dog.
3. Affirmation - agreement, yes eh, Mm
4. Notice - acknowledgement of the presence of a person or object e.g. greeting.
5. Nomination - labeling
6. Negation - causing an action to cease e.g. No.
7. Recurrence - requesting or expressing the repetition of an event.
8. Action - words describing actions e.g. push, running.
9. Object - of action, e.g. car go; in this instance, the car is the object.
10. Agent - causative agent of an action, e.g. ‘I push car’ I is the agent of the action.
11. Location - on the table; at home; over there.
12. Attribute - salient features e.g. size, colours or shape.
13. Possession - ownership e.g. my; mummy’s.
14. Experience - subjective or affective reactions e.g. hunger, fear, personal evaluation, nice.
15. Experiencer - the one who has the experience

Appendix 2: Elocutionary Force
The purpose for which each of mother’s utterances were intended was coded by 2 independent raters. The 10 minutes of speech was coded into the following categories on 1 minute time slots.

1. Give play instructions telling the child exactly how to play with the toys.
2. Make a demand on the child for good behaviour e.g. ‘stop making noise’
3. Asks child question
4. Answers child’s question
5. Use of negatives e.g. ‘Not like that’
6. The employment of praise, e.g. ‘Good girl’.
7. Imitates what her child has said.
8. Models appropriate response e.g. asks a question, ‘where is the man’? And then models the correct response herself, ‘he is sleeping’. Also models correct pronunciation by adding vocal stress to a word for emphasis.
9. Describes or interprets ongoing activity.
10. Labels objects.

### Appendix 3: Training Programme

The 8 mother- LI child pairs were invited back for a 6 session training programme following the initial 10 minutes of baseline recording.

The objectives for the training programme were formulated to enhance the rate of language acquisition in children.

**Objective**

1. To reduced authoritarian speech to the children by limiting the use of imperatives.
2. Increase the expression of language by mother, which describes and interprets child related actions.
3. Shifting the focus of the interaction from what mother desires to do and say, to what her child is doing. Hence the mother follows and comments on her child’s line of regard.
4. Mothers to increase the use of interrogatives to place communicative pressure on the child.
5. Mothers were to adopt the expression of linguistic reinforcement by utilizing praise. While reducing the use of corrective negatives.
6. Mothers were encouraged to imitate their children’s utterances to stimulate a corresponding imitation of mother by child.
7. Mothers were taught to model appropriate responses for their children, rather than insist that they label objects and say things after them.
8. Mothers were to increase the volume of their speech to their children and to run a verbal commentary on all joint activity.
9. The syntactic and semantic complexity of mother’s speech to their LI children was to be simplified.
10. Mother’s speech was to become more redundant and repetitive.
11. Mothers were to increase their responsiveness to their child’s attempts at speech.

The training sessions held for an hour a week, once a week, for six weeks. The first session was an individual one in which mothers was shown two video tapes. The first was their own recording. They were shown how to better stimulate their child through frequent comment by experimenter e.g. when he said…..you could have said……This would encourage him to…..The second video shown, was of a mother who was intuitively communicating in the style outlined in the objectives. The experimenter’s comments would run as follows here, ‘Notice how she said……when he did…..

The next 2 sessions were demonstration sessions in which the experimenter interacted directed with each child, with the mother as an observer. The objectives described above were used and highlighted by the experimenter during these sessions. Attention was drawn to the use of the specific strategies by the
experimenter by making similar comments to those which had been employed during the video taped reviews.

The last 3 sessions were practical classes where each mother worked with her own child, while the experimenter gave guidance and direction. The dyads were seen in two sessions 2-6. After the training period, mothers were asked to adopt these techniques in their routine with their child at home; it was explained that the emphasis was on interaction strategies and not on a fancy set of toys. The patterns were to be used in their daily routines. The mothers were requested to bring their child for reassessment in 1 year. A year later, the same baseline procedures were repeated. A second set of video recordings were made and analysed.

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Profile of the author
Helen Nwanze is a senior research fellow with the College of Medicine University of Lagos Nigeria. She also runs speech therapy clinics for the Lagos University Teaching Hospital. Dr. Nwanze is a speech and language pathologist with doctoral work in applied developmental psycholinguistics.