Does Mixed up Marty fix children’s speech? A no-training needed home program for children with Speech Sound disorder

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Abstract

Background: Children with phonological difficulties are currently spending a long time on waiting lists for Speech and Language therapy. Research has shown that early intervention is imperative for this population in improving their speech (Broomfield and Dodd 2005). This situation has motivated clinicians to find an alternative method of service delivery. A home program that requires little input from clinicians with parents as the agents of therapy would provide immediate timely intervention, reduce waiting lists and pressure on therapy resources.

Aims: To evaluate the effectiveness of a no-training needed home program in improving the speech of children with Speech Sound disorder

Method & Procedure: Thirteen children (aged between 3; 3 and 5; 9) with Speech Sound disorder along with their parents, took part in the study. Parents were provided with a home program that consisted of stories and activities highlighting phonological contrasts, and phonological awareness. The program was aimed at reorganising the children’s phonological system. Parents carried out the program with their children for five weeks, fifteen minutes daily six days a week. Percentage consonants correct (PCC) were recorded pre and post therapy.

Results: Statistical analyses showed that as a group, the children demonstrated statistically significant improvements in their percentage consonants correct (PCC) scores. However, the improvement was not clinically significant.

Conclusion: The program as it is did not prove clinically effective in improving the speech of children with Speech Sound disorder. Possible reasons for this and directions for future research are discussed.
Acknowledgements

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Introduction

To remediate the current problem of long waiting lists and resource constraints, a home program based on the proven techniques for children with Speech sound disorder (SSD) will be adapted for implementation by caregivers. It will provide timely intervention, reduce waiting lists and pressure on services. Caregivers will require no training as the program will be input based.

Prevalence of SSD

Children with SSD comprise more than 40% of a clinician’s caseload (Joffe and Pring 2008). SSD is the most common diagnosis made by clinicians working with a paediatric population with the majority of clients aged between two and six years (Dodd et al 2008). Currently, service provision has been condensed and clinicians are now under huge pressure to see this population within an appropriate time frame.

Children with consistent phonological disorder and phonological delay comprise this study as they are the two largest subgroups of children diagnosed with SSD. They respond successfully to similar intervention approaches and produce speech characterised by the consistent use of non-age appropriate phonological error patterns (Dodd et al 2011).

Effects of Speech Difficulties

Unintelligible speech is a typical presentation of children diagnosed with SSD (Dodd 2005). An impaired ability to communicate leads to frustration, anxiety and inappropriate behaviour (Dodd 2005). Parental concern is heightened as they struggle to understand what their child is communicating due to frequent mispronunciations.

Underlying phonological problems may persist for children with SSD which will influence language and literacy (Lancaster et al 2010). They are further at risk of social and academic failure (Gillon 2004). Long waiting lists will increase the risk of these possibilities as well as the severity of their impairment if not treated during the preschool years (McIntosh and Dodd 2008).
**Early Intervention**

Broomfield and Dodd (2004) highlighted that it may be easier to shape a child’s developing phonological system than one that is well established. Furthermore, it may be more cost effective (McIntosh and Dodd 2008), a factor that is now rated highly when prioritising children who receive intervention.

Children with developmental errors over five years are more prone to have phonological acquisition that is ‘frozen’ (Dodd 2005). Consequently, the earlier intervention is provided the better the outcome. Research has demonstrated that children with phonological disorder react best to intervention at age four years (McIntosh and Dodd 2008).

**Changing Role of the Speech and language therapist**

Clinician’s are typically utilising a ‘consultative model’ for delivering intervention to children with speech and language difficulties in schools (Law et al 2002). The emphasis is placed on working within the classroom and supporting others such as teaching assistants and parents. This form of service delivery has been observed to be ecological and holistic, two important factors for a family centred approach which Crais et al (2006) conclude is best practice.

With waiting lists continuing to grow, alternative approaches such as the consultative model need to be thoroughly researched. In the meantime, employing parents as agents of therapy offers a potential solution to the already reduced clinical time and exhausted resources.

**Parents as Agents of Therapy**

The advantages of parental participation in therapy are continuing to grow. Caregivers can consistently implement an intervention in a range of settings that are important to the child and family (Schooling et al 2010). This is important as generalisation is a key goal in intervention. Evidence surmises that children are more relaxed and confident with their parents as agents of therapy (Dodd 2005). Benefits for the caregiver include increased feelings of achievement and decreased feelings of depression and stress (Levy et al 2006).
A notable survey by Watts-Pappas et al (2008) revealed that 98% of clinicians believed that parental involvement is essential for speech intervention to be effective. What form that should take however, was not emphasised.

Research on the effectiveness of parent-led intervention is limited. Dodd and Leahy (1989) (cited in Dodd 2005) demonstrated substantial improvement in children’s phonological skills from parent-led intervention with children with Down syndrome and phonological disorder. Conversely it is debatable whether this approach was cost and time efficient as the parents required twenty-six hours of training.

In a similar study, Dodd et al (1995) (cited in Dodd 2005) illustrated that two thirds of the participants receiving parent-led intervention had reduced speech errors. Caution is warranted in interpreting these results as the sample consisted of only nine children.

Additional evidence is derived from Bowen’s Parent and Child Together (PACT) family-centred phonological therapy (Bowen and Cupples 1999a, 1999b). However, the approach is relatively resource heavy with materials being provided by the clinician and individualised slideshows for parents who require extra support.

Brady (2011) sought to fill the gap on the effectiveness of parent-led intervention. A successful home program was established for seven children with SSD. Two hours of minimal pairs training, a home visit and materials specific to their child were provided. However, the amount of time taken to carry out the training was nearly as much as would have been expended in clinician directed therapy.

Common Intervention approaches

Children with SSD react best to therapy that focuses on error patterns using phonological contrast therapy (Dodd and Bradford 2000; Dodd 2005). The most documented therapy of this kind is Minimal Pairs contrast therapy (MP), a method that has an empirical basis lasting more than twenty-five years (Williams et al 2010).

Children with SSD do not reorganize their phonological system without intervention (Dodd et al 2000). The goal of MP is to reorganise the child’s linguistic system by contrasting a child’s speech error with the target sound by utilising pairs of words containing a minimal
contrast (Dodd et al 2008). The child is confronted with a communication breakdown as a result. Both disordered and delayed phonology can be successfully treated by phonological contrast therapy (Dodd et al 2008).

Research has shown that children who make consistent speech errors respond best to MP, in comparison to those who make inconsistent speech errors (Crosbie et al 2005).

The most significant evidence to support MP derives from research by Broomfield and Dodd (2005). Results indicated that treated children progressed more rapidly than untreated children.

*Phonological awareness therapy* (PA) has also demonstrated success with the target population (Smith et al 1998; Gillon 2000). However, research by Hesketh et al (2000) showed no difference between PA or articulatory training in terms of improved PA and PCC.

Gillon (2000) also compared PA and articulatory therapy with opposing results. Children who received PA fared significantly better on measures of PA, reading and speech perception than their counterparts (Denne et al 2005). Interestingly, Gillon’s intervention comprised of twenty sessions in comparison to Hesketh et al’s ten sessions. This revelation would lead to the assumption that an extensive service delivery model such as eight-twelve weeks is necessitated for improved PA (Denne et al 2005).

Children with SSD are at risk of literacy impairment (Dodd et al 2011), particularly if they have SSD and poor PA skills when entering preschool (Preston and Edwards 2010). The relationship between PA and literacy has been well documented in the literature. Evidence suggests that literacy abilities such as spelling and reading comprehension are related to PA skills (Preston and Edwards 2010). Therefore, training in PA helps children’s reading (Hatcher et al 1994).

A *whole language approach* has also been suggested as a suitable intervention for children with phonological difficulties. The rationale behind this approach is that children acquire language through immersion and that learning occurs in the context of social interactions (Norris 1992).
The most substantial research was conveyed by Hoffman et al. (1990). Two different interventions were provided to preschool twins with phonological delay. Results illustrated that both children’s phonology improved.

Alcorn et al. (1995) investigated the whole language approach further. Results showed a significant improvement in participants’ phonemic repertoire and in word pronunciation in spontaneous speech. However, atypical error patterns did not decrease suggesting that a whole language approach is more appropriate for children with phonological delay than phonological disorder.

Modelling and recasting techniques will be included in the present study as part of a whole language approach. Phonological recast is hypothesised to provide phonological information at moments when the child is most likely to process the information (Camarata 1993). Furthermore, these techniques are input focused which will support the basis of the study.

The therapy approaches discussed are based on clinician-led intervention. Research is limited on parents carrying out the proven therapy methods with their children through a home program. In addition, research is sparse on input-focused intervention. What is out there that may resemble input-focused intervention is auditory bombardment. The efficacy of this method has not been investigated, it is never used in isolation and there is no evidence that it works. However more recently, Rvachew and Brosseau-Lapre (2012) have supported input-focused intervention with successful results for children with phonological difficulties.

**Research question**

The projected home program will be input-focused only to avoid the need for parent training. It will be presented in a way that parents are used to for example reading stories to their children.

The aim of the proposed study is to evaluate the effectiveness of a no-training needed home program in improving the speech of children with Speech Sound disorder.
Methodology

Ethical Approval and Consent

Ethical approval was granted from the University of Limerick Research Ethics committee. Informed written consent was acquired from the parents of the participants prior to the start of the study (Appendix A).

Research design

Originally, recruitment sought forty children for the study. Twenty children would have been placed in a group investigating the effect of the home program versus no treatment. The remaining twenty children would have been placed in a treatment comparison group to control whether improvement was due to the home program or 1-1 play based parental interaction.

In hindsight the study would have omitted the treatment comparison group as the group sizes were not big enough to provide meaningful results. Participant numbers were relatively low during the initial phase of recruitment. Therefore, a group who were assessed pre and post treatment only was created to allow recruitment to continue after the original deadline.

This study has three groups with a research design to accompany each group;

No treatment group (NTgp)

Repeated measures within subjects research design was utilised for this group. The no treatment period acted as a control for this group.

Hypothesis 1: A home program designed to reorganise the phonological system of children with consistent phonological disorder and children with phonological delay (SSD) will be more effective at improving children’s speech than receiving no intervention as measured by percentage consonants correct (PCC).
One to one group (1-1gp)

Repeated measures within subjects research design was also employed for this group. The multiple baseline was the control measure for this group.

**Hypothesis 2:** A home program designed to reorganise the phonological system of children with consistent phonological disorder and children with phonological delay (SSD) will be more effective at improving children’s speech than receiving 1-1 play based parental interaction as measured by percentage consonants correct (PCC)

Pre and Post group (PPgp)

A pre and post research design was utilised for this group. There was no external control for this group due to time constraints. The short duration acted as a partial control as not much improvement due to maturation would have been expected.

**Hypothesis 3:** A home program designed to reorganise the phonological system of children with consistent phonological disorder and children with phonological delay (SSD) will be effective at improving children’s speech as measured by percentage consonants correct (PCC).

The overall hypothesis for the study was that a home program designed to reorganise the phonological system of children with consistent phonological disorder and children with phonological delay (SSD), with parents as the agents of therapy, will be effective at improving children’s speech as measured by percentage consonants correct (PCC).

Repeated measures fail to account for practice effects. Independent measures would have avoided practice effects however repeated measures are more suitable for a small sample and are time efficient (McLeod 2007). What this study could have done is employ counter balancing to combat the order effects and ensure validity of the study. Time constraints nevertheless, prevented the study from utilising counterbalancing.

The independent variable of the study was the home program. The Dependent variable was the percentage consonants correct (PCC) score for each child.
**Initial assessment**

Assessment sessions lasted forty-five minutes approximately and took place in a quiet clinic environment with minimal distractions. In all cases, two researchers were present and one or more parents. One researcher acted as the lead researcher and carried out the assessment with the child. The second researcher acted as an additional transcriber for the assessment. The participants’ speech skills were assessed using the diagnostic screener and phonology subtest from the Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd *et al* 2002). Whilst the assessment was being administered, parents filled out a case history form and the Likert scale (see Appendix B and Appendix C). The Likert scale measured the parents’ perception of the level of awareness their child had towards their speech difficulty.

Children were assigned to one of three different groups;

1. No treatment (NTgp)
2. Fifteen minute 1-1 play based parental interaction six days a week over a five week period (1-1gp)
3. Straight to the home program (PPgp)

Children were assigned to a group depending on their initial assessment date for example children who attended on the first day of assessments were placed in the no treatment group (NTgp).

Parents of the children in the second group were given instructions and examples of play based activities. They were also provided with a diary to record the activity, duration and any general comments.

**Pre treatment assessment**

Five weeks after their initial assessment, parents and children were invited to attend a second assessment session. The phonology subtest of the DEAP was readministered. The participants’ PCC was calculated again and phonological processes used were examined and
classified as normal or atypical according to the norms of the Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd et al 2002).

During this second assessment session, parents were provided with the home program. Researchers thoroughly explained each section of the program and highlighted stories and activities that would be most relevant for their child in accordance with speech errors produced. Parents were instructed to carry out the program with their child for fifteen minutes daily six days a week for five weeks.

The third group (PPgp) slotted into this phase of assessment. They were initially assessed and given the home program.

Post-treatment assessment

Parents were provided with a final Likert scale and an additional questionnaire on their overall impression of the home program (Appendix D). The phonology subtest of the DEAP was administered once more and the data was analysed.

Participants

Thirteen children (seven male and six female) and their parents volunteered to take part in the study. The participants were aged 3;3-5;9 with the average age being 4;4. Participants were initially sourced from a recruitment email that was sent to everyone in the University of Limerick (Appendix E).

A second stage of recruitment involved putting up information posters in local Speech and Language therapy clinics, crèches, retail outlets, doctor’s surgeries, schools, shops and post offices (Appendix F). Interested parents contacted the key researcher through email or phone voicemail. Parents were phoned back and asked a series of questions to enable adequate screening. Suitable children were posted an information pack about the program and an agreed appointment date for their initial assessment (Appendix G).

Inclusionary criteria comprised children who had phonological difficulties aged between 3;0 and 5;11. Research has demonstrated that children with developmental errors over five years are more prone to have phonological acquisition that is ‘frozen’ (Dodd 2005). Therefore, this age group was prioritised as early intervention is imperative.
Exclusionary criteria included bilingual children and children who had additional diagnoses other than speech difficulties for example hearing difficulty. Children who presented with inconsistent speech patterns were also excluded as the home program is primarily based on minimal pair type intervention which has been shown to be most effective with children who have consistent speech errors (Dodd and Bradford 2000). Children who were currently receiving therapy were also excluded.

Ten of the children had a diagnosis of phonological delay as they made speech errors that were inappropriate for their chronological age according to the norms of the Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd et al 2002). The remaining three children were diagnosed with mixed phonological delay and consistent phonological disorder as they made speech errors atypical of normal developmental groups (see Table1). Consistent speech error patterns were determined if five examples were evident and classification of typical development or phonological delay was determined in accordance with the assessment manual. If a child exhibited two or more non-developmental error patterns a classification of consistent phonological disorder was diagnosed.

Table 1: Participant details

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**Materials**

1. Diagnostic Evaluation of Articulation and Phonology (DEAP)

The diagnostic screener and phonology subtest were administered. The diagnostic screener contains ten pictures of which the participants were asked to name. Phonemes in error or not elicited were then probed for stimulability before the participants were asked to name the pictures again. Consistency was examined and rated. The phonology subtest consisting of fifty pictures was then produced and participants were asked to name each picture. Phonological ability was examined and speech errors were classified as typical or atypical of normal development according to the norms of the Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd *et al* 2002). Following the session each participant’s percentage consonants correct (PCC) score was calculated to determine speech accuracy (Appendix H). For this study, participant’s PCC was utilised as initial baseline measures.

2. Case history form

Relevant background information was obtained in order to devise an holistic profile of each child

3. Likert scale

Parents were required to complete a Likert scale initial, pre and post intervention on their perception of their child’s speech difficulty. They were asked to rate the impact their child’s speech difficulty was having on their functional communication and to rate their perception of the level of awareness their child had towards their speech difficulty. The scale contained eight statements and parents were required to rate their level of agreement with each statement on a level of 1-5 ranging from 1=strongly disagree to 5= strongly agree.

**Summary of intervention**

The ‘Let’s Talk Program for better speech’ is a pre-school speech program for children who are producing phonological errors. The program contains a range of stories and activities that promote phonological development. All materials were printed in colour to infer a sense of fun and age appropriateness (Appendix I). The program was specifically created for this study and was developed by the researchers. All participants received identical
materials with clear detailed instructions on how best to carry out the program. All parents received additional materials for the home program in the post which assisted motivation and participation by the child. Samples from the home program will now be discussed (Appendix J).

*Minimal pair type intervention*

- **Mixed up sound stories**

Participants were introduced to ‘Mixed up Marty’ and his friends. Mixed up Marty produced various speech errors. These stories highlighted an element of confusion as Marty often mixed up his words and as a result he was not always understood. The aim of these stories was for each child to recognise which sounds go together to make a difference between words. This is the basis behind the minimal pair approach. A child’s phonological system is confronted by recognising the similarities and differences between sounds and how these mark differences in meaning (Dodd et al 2008). This process allows children to actively organise sounds into classes and sequences into structures, leading to greater understanding of the phonological system and allowing generalisation to non-treated phonological structures (Grunwell, cited in Dodd et al 2008).

Brady (2011) surmised that Minimal pair type intervention was difficult to teach to caregivers and quite time consuming. In her research, training also involved a home visit halfway through the intervention. Gardner (2006) reported that parents were carrying out therapy tasks at home with a different style of interaction than observed from the clinician’s therapy session. To remediate this discrepancy and to ensure time efficiency, this program will require no training and will be input-focused.

*Input-focused intervention*

Minimal pair type intervention in this instance will require the child to listen to the speech error rather than focusing on producing the correct sound. Providing the child with opportunities to hear and reflect on the error produced develops self-repair and forms an integral part of the therapeutic approach (Gardner 2006).
Evidence to support input-focused intervention derives from research by Rvachew and Brosseau-Lapre (2012). Their results disclosed that input-focused intervention showed similar gains when compared to speech production intervention. Furthermore, input-focused intervention was the most effective treatment for the promotion of phonological awareness- an area that has been shown to be deficit in children with SSD (Leitao et al 1997).

**Phonological awareness activities**

These activities centred on improving a child’s letter/sound knowledge and phonological awareness (PA). As a group, children with SSD display deficits on a variety of PA tasks (Gillon 2004).

Children who perform poorly on assessments of PA typically have difficulties learning to read and spell (Passenger et al, cited in Dodd and Gillon 2001). A home program that includes PA activities for children with SSD is necessitated as without specific PA intervention difficulties will persist over time.

- Nursery rhymes

Parents were given thirteen nursery rhymes and activities to read and talk about with their child. PA is a multilevel skill, typically comprising of syllable awareness, onset-rime awareness and phoneme awareness (Gillon 2004). Learning and reciting nursery rhymes is a skill thought to facilitate early PA (Gillon 2004). Nursery rhymes will target the child’s PA skills as well as acting as near minimal pairs.

- Scrapbook activity

Parents choose a page for a sound in a scrapbook. Parents and children then looked for pictures of words beginning with that sound to stick into the scrapbook. If a child substituted one sound word initially for another sound, words beginning with the sound and its substitute were presented on opposite pages to make the difference salient. The purpose of this was to teach identification of the first sound of a word which is linked to reading ability (Gillon 2004).
Whole Language

Parents were provided with several examples of how to give appropriate feedback during the sessions and were directed to modelling and recasting techniques in the program (Appendix K). Recasting speech errors is sufficient for speech to regularize (Camarata 1993). Parents were encouraged to practice these techniques throughout the day with their child.

Parents were provided with a star chart and a diary to record what activity/story was carried out and if they had noticed any progress in their child’s speech for example, if they heard their child produce a new sound (Appendix L and Appendix M).

Reliability

Two researchers completed transcriptions during each assessment session with the lead researcher carrying out the assessment and the second researcher observing. Sessions were recorded on an Olympus Digital Voice Recorder VN-750. All transcriptions were verified for accuracy against the audio recording by the lead researcher. Discrepancy between the two researchers’ transcriptions was resolved by listening back to the audio recording. A 95% agreement was reached over phonemic transcriptions with the lead researcher having the final say. The same researchers assessed each participant initial, pre and post intervention.
Results

The results of this study are presented through descriptive analysis and inferential statistics. Statistics were carried out using non-parametric tests. This analysis method was chosen as a histogram revealed that the data was not normally distributed and Shapiro Wilk revealed a significance value of less than 0.05.

Group analyses of PCC

Table2 demonstrates PCC scores at initial assessment, pre HP and post HP for all participants.

Table2: PCC scores at initial assessment, pre intervention and post intervention

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<td>62</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>64</td>
<td>Delay</td>
<td>PP</td>
<td>76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was a large amount of variability between initial assessment (Time1) and pre HP assessment (Time2) for the 1-1gp and NTgp, with most children showing a decrease in their PCC score. This shows that there was no significant sign of improvement during these five
weeks, but as children very rarely get worse at speech in real terms (as opposed to relative to their age), this demonstrates a large variability in measurement at different times.

A Wilcoxon Signed Ranks Test was used to probe whether there was a significant improvement in children’s PCC Time1-Time2 for the 1-1gp and NTgp. The results confirmed that there was no significant improvement in PCC scores ($z=-.734; p=0.463, n=7$), with a mean decrease of 2.3%.

No stable baseline was achieved for either of these groups. Therefore, an average of the two pre-treatment assessment scores was taken as the pre-treatment score to account for measurement variability between the two times.

A Wilcoxon Signed Ranks Test was used to investigate the overall change in PCC scores pre and post intervention. The average scores of Time1 and Time2 for the 1-1gp and NTgp were combined with the pre HP scores for the PPgp, to allow comparison with all groups’ post HP scores (Time3). The aim of this analysis was to explore the hypothesis that a home program carried out by parents to children with SSD was effective at improving their speech in terms of PCC. The results revealed a significant improvement in PCC scores ($z=-2.037; p=0.042$) with a mean increase of 3.5%, thus accepting the hypothesis. Figure 1 shows the changes in PCC scores for each child.

![Figure 1: Changes in PCC scores at initial assessment, pre HP and post HP](image)
Individual group analyses of PCC

Group who had no treatment for five weeks Time1-Time2 (NTgp)

A Friedman test revealed that there was no significant difference between PCC scores at the three times for the NTgp \((x^2(2) = 1.636, p=0.441, n=3)\). Even though the results were not statistically significant, post-hoc analysis was carried out to determine if there was any mean difference in PCC scores between Time1-Time2 and Time2-Time3.

A Wilcoxon Signed Ranks Test was utilised to investigate the change in PCC Time1-Time2. The results show that there was no significant improvement in PCC \((z=-1.342; p=0.180)\), with a mean decrease of 4%.

A Wilcoxon Signed Ranks Test was further used to examine the change in PCC Time2-Time3. The results show that there was no significant improvement in PCC \((z=-0.816; p=0.414)\), with a mean increase of 2.3%.

The goal of this analysis was to examine the hypothesis that the HP was more effective at improving the children’s PCC in comparison to no intervention. Both results were not statistically significant. However, there was a mean increase in PCC Time2-Time3. Thus the hypothesis is supported. Figure 2 shows the changes in PCC scores for each child.

![Figure 2: Changes in PCC scores at initial assessment, pre HP and post HP for NTgp](image)

**Figure 2:** Changes in PCC scores at initial assessment, pre HP and post HP for NTgp
**Group who had 1-1 play based parental interaction for five weeks Time1-Time2 (1-1gp)**

A Friedman test demonstrated that there was no significant difference between PCC scores at the three times for the 1-1gp ($\chi^2(2) = 3.500, p=0.174, n=4$). Similarly to the NTgp, post-hoc analysis was carried out to determine if there was any mean difference in PCC scores between Time1-Time2 and Time2-Time3.

A Wilcoxon Signed Ranks Test was employed to explore the difference in PCC Time1-Time2. The results show that there was no significant improvement in PCC ($z=0.000; p=1.000$), with a mean decrease of 1%. There was no difference between the mean results Time1-Time2, therefore the null hypothesis is accepted. Parental interaction did not improve the children’s PCC in comparison to no intervention.

A Wilcoxon Signed Ranks Test was further carried out to investigate the difference in PCC Time2-Time3. The results convey that there was no significant improvement in PCC ($z=-1.826; p=0.068$), with a mean increase of 6.75%.

The aim of this analysis was to consider the hypothesis that the HP was more effective at improving the children’s PCC in comparison to 1-1 play based parental interaction. Both results were not statistically significant. However, children’s PCC scores improved more after the HP than after parental interaction. Thus, the hypothesis is supported. Figure 3 displays the changes in PCC scores for each child.

![Figure 3: Changes in PCC scores at initial assessment, pre HP and post HP for 1-1gp](image-url)
**Group who received the HP at initial assessment (PPgp)**

A Wilcoxon Signed Ranks Test was exercised to examine the change in PCC scores for the PPgp. The objective of this analysis was to consider the hypothesis that the HP was effective at improving the children’s PCC. The results show that there was no significant improvement in PCC ($z=-1.382; p=0.167, n=6$), consequently the hypothesis is rejected. Figure4 shows the changes in PCC scores for each child.

![Figure4: Changes in PCC scores pre HP and post HP for PPgp](image)

**Comparison between PCC improvements for each group**

The average PCC improvements for all three groups’ at initial assessment, pre and post HP are displayed in Table3. Results reveal that the 1-1gp (play based parental interaction versus the home program) increased the most compared to the NTgp and PPgp (treatment versus no treatment).

**Table3: Mean scores for all three groups at initial assessment, pre HP and post HP**

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Initial Ax Mean</th>
<th>Pre HP Mean</th>
<th>Highest Pre HP Mean</th>
<th>Post HP Mean</th>
<th>Increase</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1gp</td>
<td>4</td>
<td>64.00</td>
<td>63.00</td>
<td>64.00</td>
<td>70.00</td>
<td>6.00</td>
<td>6.00</td>
</tr>
<tr>
<td>NTgp</td>
<td>3</td>
<td>76.33</td>
<td>72.33</td>
<td>76.33</td>
<td>74.67</td>
<td>-1.66</td>
<td>2.00</td>
</tr>
<tr>
<td>PPgp</td>
<td>6</td>
<td>61.67</td>
<td>61.67</td>
<td>61.67</td>
<td>65.33</td>
<td>3.66</td>
<td></td>
</tr>
</tbody>
</table>
**Individual effect of HP**

Table 4 provides a summary of the effect of the HP on each individual case. It allows us to compare the effect of no intervention versus the HP and the effect of 1-1 versus the HP.

**Table 4: Summary of each individual case**

<table>
<thead>
<tr>
<th>Child</th>
<th>CA</th>
<th>Gen</th>
<th>Gp</th>
<th>PCC Change: Initial Ax to Post HP Ax</th>
<th>FH</th>
<th>Parents’ educ.</th>
<th>Parents’ perception of speech improvement: Likert Scale</th>
<th>Compliance of 30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>53</td>
<td>F</td>
<td>1-1</td>
<td>✓ Initial PCC: 56 Pre HP PCC:52 Post HP PCC:62</td>
<td>No</td>
<td>LC/LC</td>
<td>Improved speech perceived</td>
<td>22 days</td>
</tr>
<tr>
<td>2</td>
<td>56</td>
<td>F</td>
<td>1-1</td>
<td>✓ Initial PCC: 79 Pre HP PCC: 84 Post HP PCC: 92</td>
<td>No</td>
<td>3ª/3ª</td>
<td>No improvement in speech perceived</td>
<td>Unknown: Diary not returned</td>
</tr>
<tr>
<td>3</td>
<td>53</td>
<td>M</td>
<td>1-1</td>
<td>✓ Initial PCC: 56 Pre HP PCC: 62 Post HP PCC: 64</td>
<td>No</td>
<td>3ª/Post LC</td>
<td>Improved speech perceived</td>
<td>19 days</td>
</tr>
<tr>
<td>6</td>
<td>39</td>
<td>M</td>
<td>1-1</td>
<td>X Initial PCC: 65 Pre HP PCC: 54 Post HP PCC: 61</td>
<td>No</td>
<td>Post LC/3ª</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
<tr>
<td>4</td>
<td>69</td>
<td>M</td>
<td>NT</td>
<td>X Initial PCC: 82 Pre HP PCC: 82 Post HP PCC: 78</td>
<td>No</td>
<td>3ª/JC</td>
<td>Improved speech perceived</td>
<td>12 days home 18 days teacher</td>
</tr>
<tr>
<td>5</td>
<td>43</td>
<td>M</td>
<td>NT</td>
<td>✓ Initial PCC: 66 Pre HP PCC: 63 Post HP PCC: 67</td>
<td>Yes</td>
<td>3ª/3ª</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>F</td>
<td>NT</td>
<td>X Initial PCC: 81 Pre HP PCC: 72 Post HP PCC: 79</td>
<td>No</td>
<td>3ª/N/A</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
<tr>
<td>8</td>
<td>45</td>
<td>F</td>
<td>PP</td>
<td>✓ Pre HP PCC: 61 Post HP PCC: 71</td>
<td>No</td>
<td>3ª/3ª</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
<tr>
<td>9</td>
<td>42</td>
<td>M</td>
<td>PP</td>
<td>✓ Pre HP PCC: 27 Post HP PCC: 35</td>
<td>No</td>
<td>Post LC/3ª</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
<tr>
<td>10</td>
<td>47</td>
<td>F</td>
<td>PP</td>
<td>X Pre HP PCC: 72 Post HP PCC: 68</td>
<td>No</td>
<td>Post LC/3ª</td>
<td>Improved speech perceived</td>
<td>19 days</td>
</tr>
<tr>
<td>11</td>
<td>54</td>
<td>M</td>
<td>PP</td>
<td>✓ Pre HP PCC: 72 Post HP PCC: 76</td>
<td>Yes</td>
<td>JC/JC</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
<tr>
<td>12</td>
<td>53</td>
<td>F</td>
<td>PP</td>
<td>X Pre HP PCC: 62 Post HP PCC: 58</td>
<td>Yes</td>
<td>LC/N/A</td>
<td>Improved speech perceived</td>
<td>28 days</td>
</tr>
<tr>
<td>13</td>
<td>64</td>
<td>M</td>
<td>PP</td>
<td>✓ Pre HP PCC: 76 Post HP PCC: 84</td>
<td>No</td>
<td>Post LC/3ª</td>
<td>Improved speech perceived</td>
<td>30 days</td>
</tr>
</tbody>
</table>
Group who had 1-1 play based parental interaction for five weeks Time1-Time2 (1-1gp)

All children’s PCC scores improved post HP except for Case6. He had grommets inserted during the intervention which may have influenced the results (Appendix N). However, for Case3, the improvement post HP was smaller than on 1-1 intervention.

Case1 appears to have made adequate improvement but looking closely at the difference in scores between initial assessment and pre HP assessment, a large amount of this improvement is due to normal variation between assessments at different times. Therefore, only Case2 shows more PCC improvement post HP than post 1-1 intervention.

Group who had no treatment for five weeks Time1-Time2 (NTgp)

Case5 and Case7 PCC scores decreased after no intervention. Their PCC’s increased again post HP. However, this improvement is probably not a result of the HP as the increase in PCC was too small. Furthermore, a closer look at Case7’s PCC reveals that overall his PCC decreased from initial assessment to post HP. Case4’s PCC did not increase post HP possibly due to noncompliance (see Table4).

Group who received the HP at initial assessment (PPgp)

Case10’s PCC decreased post HP. In examining the individual effect (Appendix N), Case10 was receiving group language therapy at the same time as the HP. Additionally, the diary revealed that the HP was carried out for only 19 of the 30 day intervention (see Table4).

Case12’s PCC similarly decreased post HP. Case12’s father reported an improvement in the child’s speech. Conversely, parents often reported an improvement in their child’s speech that did not correlate with a PCC improvement (see Table6). Case12’s diary also demonstrated that she did not like the stories and activities that specifically targeted her error process.
**Post-hoc analysis**

To explore other potential benefits of the home program a post-hoc analysis of parents’ final Likert scales occurred. Data presented is from another branch of the research. Nine out of thirteen parents perceived speech improvement that did not correlate with actual PCC improvement. Table6 demonstrates the relationship between parents’ perception of overall speech improvement and actual PCC improvement.

**Table6: Parents’ final Likert scale results and correspondence with calculated PCC change**

<table>
<thead>
<tr>
<th>Case No:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in PCC (%)</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>-4</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>8</td>
<td>-4</td>
<td>4</td>
<td>-4</td>
<td>8</td>
</tr>
<tr>
<td>The home program was beneficial for my child.</td>
<td>SA</td>
<td>N</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
</tr>
<tr>
<td>I think my child’s speech has improved over the last 5 weeks.</td>
<td>A</td>
<td>D</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>SA</td>
<td>SA</td>
<td>SA</td>
<td>A</td>
<td>SA</td>
<td>A</td>
<td>SA</td>
</tr>
<tr>
<td>I think my child is a more confident communicator now.</td>
<td>A</td>
<td>N</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>SA</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>SA</td>
</tr>
<tr>
<td>Other people have commented that my child’s speech has improved over the last five weeks.</td>
<td>N</td>
<td>D</td>
<td>N</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>SA</td>
<td>A</td>
<td>A</td>
<td>SA</td>
<td>N</td>
<td>SA</td>
</tr>
</tbody>
</table>

**Key:**
- **SA:** Strongly agree  
- **A:** Agree
- **N:** Neither Agree nor Disagree  
- **D:** Disagree
- **SD:** Strongly disagree
**Standard Scores**

Clinicians often use Standard Scores as a severity measure when diagnosing clients (DEAP; Dodd et al 2002). Examining changes in SS indicates the significance of the change. A small change in PCC can cause a large change in SS for an older child. For example, a change from a SS of 5 to a 7 would indicate that the child is no longer delayed. This would then result in some children being removed from waiting lists.

Table 7 shows the changes in Standard Scores for each child at initial assessment, pre HP and post HP. These standard scores were taken from the DEAP Irish norms (Leahy et al 2011).

<table>
<thead>
<tr>
<th>Case number</th>
<th>SS Initial Ax</th>
<th>SS Pre HP</th>
<th>SS Post HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3</td>
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<tr>
<td>8</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

No child improved significantly in terms of Standard Score except for Case 2 and Case 13. Case 2 moved from the severe to normal range and Case 13 from severe to mild range. This demonstrates clinically significant change in these two children. However, Case 2 seemed to be improving regardless, either as a result of 1-1 interaction or plain maturation.
It should be noted that Case6 and Case10 changed age brackets during the intervention. As a result of this and because of a decrease in PCC, their Standard Scores dropped by 1SS post HP compared to when at initial assessment.

Case7 did not change age bracket. Her PCC decreased after no treatment and increased again post HP but not to the level of the initial assessment.

A Wilcoxon Signed Ranks Test was lastly employed to investigate the overall change in Standard Scores (SS) pre and post intervention. The results show that there was no significant improvement in SS scores ($z= -0.843; p=0.399$). Figure5 shows the changes in SS for each child.

![Figure5: Changes in Standard Scores at initial assessment, pre HP and post HP](image)

**External variables**

Data was further explored using a scatter plot to determine if the difference in all groups PCC scores was due to external variables. The scatter plot demonstrated that diagnosis, age, family history, parental education or compliance with the program did not influence the results. This method was chosen as numbers were too small to allow for statistical investigation in these groupings.
Discussion

The purpose of this study was to evaluate the effectiveness of a no-training needed home program in improving the speech of children with Speech Sound disorder. The reasoning behind no-training needed was to promote time and cost efficiency and to encourage parents to take part.

Results conveyed a statistically significant difference in PCC scores for the whole group pre and post intervention, suggesting that the home program effected some change. However, the improvement was minimal with the average gain being only 3.5%, with only three children improving in terms of Standard Score. Only eight out of the thirteen children showed improvement in PCC scores post intervention. Therefore, the home program was not clinically effective in improving the speech of children with Speech Sound Disorder.

Further findings

It was hypothesised that the home program would be more effective at improving children’s speech than receiving no intervention as measured by PCC. This hypothesis was supported with results revealing a mean increase of 2.3% post intervention. This is not a surprising result as research has shown that treated children progress more rapidly than untreated children (Broomfield and Dodd 2005). Furthermore, children with SSD do not reorganize their phonological system without intervention (Dodd et al 2000).

A second hypothesis proposed that the home program was more effective at improving children’s PCC in comparison to 1-1 play based parental interaction. Results conveyed no mean difference in PCC scores between initial assessment and post parental interaction. There was a mean difference post intervention implying that the home program improved the children’s PCC in comparison to parental interaction. Thus, the hypothesis is validated.

Comparison between groups demonstrated that children who received parental interaction and the home program increased more than the groups who just received the home program. This may suggest that parental interaction in the form of a whole language approach has an effect in the long term. Norris (1992) describes how children acquire language through immersion and that learning occurs in the context of social interactions. Brady (2011) cautiously reported that an increase in parental interaction would improve
speech accuracy. However, Kahmi (2006) concluded that evidence in support of language-based approaches is not convincing.

Interesting to note is that there was a large amount of variability between initial assessment and pre HP assessment for the 1-1gp and NTgp, with most children showing a decrease in their PCC score. This is an unexpected finding as there is a general agreement that prevalence of speech disability decreases with increasing age (Harasty and Reed, cited in Broomfield and Dodd 2004).

Clinician’s often administer screening tests such as the DEAP to form an initial impression of a child and determine whether further assessment is necessitated. For this study, only the phonology subtest was administered with PCC as outcome measures. Results demonstrated that nine out of thirteen parents perceived speech improvement that did not correlate with actual PCC improvement. This is evidence that changes did occur but were not captured by PCC alone. The author cautions clinician’s to employ adequate outcome measures and carry out comprehensive phonetic-phonemic evaluations to account for variability between assessments (Bauman-Waengler 2008).

Examining confidence intervals is also advised as a range of scores rather than a single value is useful when making important clinical management decisions based on assessment results (DEAP; Dodd et al 2002).

The last hypothesis was PCC scores for children in the PPgp would improve following the HP. Results demonstrated that there was no significant improvement in PCC scores post intervention for this group, thus the hypothesis is rejected. Maternal education was not statistically analysed to determine whether it influenced the results as the sample was too small. For this group, only one of the six mothers had achieved 3rd level qualifications. The influence of this factor needs further investigation. However, Dollaghan et al (1999) suggest that there is no significant trend between PCC and maternal education.

**Comparison with other home programs**

Unlike previous research, this study did not provide training to caregivers. This is important to note as clinical time is often spent training parents to ensure success (Dodd and Leahy 1989). However, not providing training may have been a potential factor in why the home
program did not work. Successful trained home programs for children with phonological difficulties have been reported in the literature for example Brady (2011) and Bowen and Cupples (1999).

The clinical ineffectiveness of the home program warrants investigation. A mean increase of 3.5% PCC is not clinically significant and thus hinders the applicability and validity of the home program to the target population. Dodd et al (2008) revealed a mean increase of 16% PCC over a twelve-week period. More recently Brady (2011) reported a median increase of 17% PCC over a six-week period. Dodd et al’s outcome was based on clinician-led intervention in comparison to Brady’s impressive outcome from parent-led intervention. Dodd and Leahy (1989) further report a mean increase of 30% PCC over a thirteen-week period from parent-led intervention.

What differs to the evidence just outlined is that this home program involved no form of training. The home program was input-focused to replace training of caregivers and thus promote cost efficiency. Possible reasons for the poor result will now be explored.

**Potential reasons for ineffectiveness**

It is possible that the children would have benefitted more from the program if it had run for longer than five weeks. Law et al (2004) identified longer durations of therapy (8weeks) as being a potential factor in good clinical outcomes. Denne et al (2005) mirror this claim as they indicate that 8weeks or longer is necessitated for improved phonological awareness. However, neither of the studies correlated to a realistic block of clinician-led intervention (6weeks) (Glogowska et al 2000).

Research has shown that it is difficult to train parents to deliver effective feedback for production tasks (Gardner 2006). Therefore, the home program was designed to include input-only intervention. Results convey that this approach was not effective and targets in therapy need to include production. Research is limited on input-focused intervention with children with SSD but preliminary evidence by Rvachew and Brosseau-Lapre (2012) provide positive results. The author concludes that this approach warrants further investigation as this study does not provide evidence for the effectiveness of input-focused intervention for children with SSD.
Lastly, parents may not have been truly honest regarding their compliance in carrying out the program with their child. Parental reports by their very nature are subjective (Rvachew and Nowak 2001).

**Limitations**

The DEAP may not have been an appropriate assessment choice as it’s primarily used as a diagnostic tool and ideally should not have been administered so frequently in such a short time frame. The author cautiously conveys that some children may have reverted back to their old speech patterns with decreased motivation evident by the final assessment (practice effect). If a client shows improvement in pre therapy baselines this may be due to a practice effect from repeated testing with the same items (Franklin 1997). A connected speech sample may have been more representative of a child’s speech accuracy. Reports from parents and informal observations from the researchers of the children suggest an improvement beyond what the DEAP subtest examined.

Utilising PCC scores as outcome measures also has its disadvantages. The PCC procedure was developed as a method of assessing severity rather than for measuring change and it has its drawbacks as a method of evaluating therapy (Hall et al 1998). Examples of improvements that were not captured by PCC include parent’s perceptions of speech improvement and effects on children’s structural rather than substitution processes (Sheils 2013). A sensitive instrument to detect small changes in the child’s phonological system following intervention such as a probe scoring system is recommended for future studies.

**Clinical implications**

The variability of PCC scores at Time1 and Time2, with so many children performing worse at Time2 was unexpected, and clinicians need to be aware that ‘snapshot’ assessments may not reflect the child’s true ability. The significance of this implication was emphasised by an average 35% decrease in PCC between Time1 and Time2 for the whole group.

Providing a home program to parents on initial assessment means that therapy can begin straight away. An effective home program could mean that by the time the child reaches their intervention appointment their speech accuracy will have improved or they may even be fully intelligible. As a result they may not require an intensive block of therapy which will
inevitably reduce waiting lists. Children who did not make significant gains will subsequently be highlighted and clinicians can prioritise for more direct therapy.

Results reported no significant improvement in Standard Scores for the whole group post intervention. However, some children changed severity in terms of SS, for example Case2 severe to normal and Case13 severe to mild (see Table7). As only two children improved in terms of SS this is not a noteworthy finding as a larger sample would be required for implementation. However, as the home program is potentially cost free it is not going to do any harm and could act as a free substitute for story books for example. Ethically parents need to be aware that it may not improve their child’s speech accuracy and not to spend vast amounts of time carrying it out.

**Conclusion**

The aim of the present study was to evaluate the effectiveness of a no-training needed home program in improving the speech of children with Speech Sound disorder. Possible reasons were identified on why the home program was not successful. These include not training the caregivers, utilising input-only intervention and initiating an intervention for a short duration (5weeks).

The home program as is has not proved clinically effective, although there was some evidence of small changes. Modifications need to occur before it’s offered as an effective home program for children with SSD.
References


Carey, C. (2011) Parents as Agents of Therapy for Speech Sound Disorders: Does it Work?, unpublished thesis (MSc), University of Limerick


Dodd, B. (2011) ‘Differentiating speech delay from disorder: Does it matter?’, Topics in Language Disorder, 31(2), 96-11


Law, J., Lindsay, G., Peacey, N., Gascoigne, M., Soloff, N., Radford, J. and Band, S. (2002) ‘Consultation as a model for providing speech and language therapy in schools: a panacea or one step too far?’, Child Language Teaching and Therapy, 18, 145


Appendix A
Parent Consent Form

Study title: A novel home program for children with speech sound disorders

Name of Principal Researcher: Aileen Wright, BA(Hons), MSc. MIASLT. University of Limerick

- I confirm that I have read and understand the information sheet dated.................... (version............) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

- I understand that my child’s participation is voluntary and that I am free to withdraw him/her at any time without giving any reason, and without his/her healthcare or legal rights being affected.

- I understand that my child’s identity will be kept confidential and it will not be possible to identify him or her in any reported findings.

- I agree to let my child take part in the above study.

Name of Child: ______________________________DOB:__________
Name of Parent : _____________________________Date:__________
Signature:___________________
Address:___________________________________________
Telephone: ___________________ Email address:___________________________

This research has received ethical approval from the University of Limerick Research Ethics Committee. If you have concerns regarding this study, please contact: Chairman, Education and Health Sciences, Research Ethics Committee, EHS Faculty Office, University of Limerick, Tel (061) 234101 Email: ehsresearchethics@ul.ie
Appendix B
### Case history form

<table>
<thead>
<tr>
<th>Case No:</th>
<th>Date</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Child’s Name:</th>
<th>DOB:</th>
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</table>

<table>
<thead>
<tr>
<th>Address:</th>
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</table>

<table>
<thead>
<tr>
<th>Mother’s name</th>
<th>Phone:</th>
</tr>
</thead>
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</table>

<table>
<thead>
<tr>
<th>Father’s name</th>
<th>Phone:</th>
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</table>

<table>
<thead>
<tr>
<th>Carer’s name (if different from parent)</th>
<th>Phone:</th>
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</table>

<table>
<thead>
<tr>
<th>Brothers and sisters</th>
<th>Age</th>
</tr>
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<tbody>
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</tr>
</tbody>
</table>

#### Diagnosis:

- Normal
- Articulation
- Phon. Delay
- Consistent Phon. Disorder
- Inconsistent Phon. Disorder
- Other:

#### Recommendations:

- Discharge
- Review
- Waitlist for therapy
- Assess language
- Aileen Wright, SLT
- Other:

---

I consent to this session being recorded on audio. The recording **may/may not** (delete where applicable) be used for teaching purposes by the University of Limerick. My child will not be identified.

Signed: ___________________________ Date: ____________________
**Your Concerns**

<table>
<thead>
<tr>
<th>Concern</th>
<th>Y/N</th>
<th>For me</th>
<th>for family</th>
<th>for strangers</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child does not speak properly</td>
<td>Y/N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child is difficult to understand:</td>
<td>Y/N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child is difficult to understand: (For me)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child is difficult to understand: (For family)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child is difficult to understand: (For strangers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child has very few words</td>
<td>Y/N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child is not joining words into phrases</td>
<td>Y/N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am concerned about my child’s behaviour</td>
<td>Y/N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have other concerns (Please give details):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Family history**

<table>
<thead>
<tr>
<th>Concern</th>
<th>Y/N</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Other people in my child’s family have difficulty with speech or language. (Please give details):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people in my child’s family have difficulty with reading or writing (Please give details):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Parents’ education: Please tick each box that applies:**

<table>
<thead>
<tr>
<th>Education</th>
<th>Mother</th>
<th>Father</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Cert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaving Cert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post leaving cert e.g. FETAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third level (University, IT etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth &amp; development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My child was born prematurely</td>
<td>Y/N</td>
<td>No. of weeks?</td>
</tr>
<tr>
<td>My child needed special care when born</td>
<td>Y/N</td>
<td>How long?</td>
</tr>
<tr>
<td>My child had some feeding difficulties as a baby</td>
<td>Y/N</td>
<td></td>
</tr>
<tr>
<td>My child has some eating/drinking difficulties now</td>
<td>Y/N</td>
<td></td>
</tr>
<tr>
<td>My child drools a lot</td>
<td>Y/N</td>
<td></td>
</tr>
<tr>
<td>My child uses a soother</td>
<td>Y/N</td>
<td></td>
</tr>
<tr>
<td>My child sat up at age:</td>
<td>Months</td>
<td></td>
</tr>
<tr>
<td>My child walked at age:</td>
<td>Months</td>
<td></td>
</tr>
<tr>
<td>My child has difficulties with motor skills, e.g. running, climbing, picking up small things</td>
<td>Y/N</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communication development</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child babbled as a baby</td>
</tr>
<tr>
<td>My child said his/her first words at age:</td>
</tr>
<tr>
<td>My child joined words together at age:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child has a health problem: (please give details)</td>
</tr>
<tr>
<td>My child has been in hospital: (please give details)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child has had a hearing test:</td>
</tr>
<tr>
<td>Result of hearing test:</td>
</tr>
<tr>
<td>My child has had ear infections:</td>
</tr>
<tr>
<td>Personality</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>My child plays well with others</td>
</tr>
<tr>
<td>My child is very shy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>My child is at home with a parent</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child is looked after by a childminder</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child goes to crèche/nursery</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child goes to playschool</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child goes to school</td>
<td>Y/N</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Exposure to other languages</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>English is the only language spoken at home</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child hears Irish spoken in the home</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child hears another language spoken at home</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child hears another language spoken outside home</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child speaks another language</td>
<td>Y/N</td>
</tr>
<tr>
<td>My child goes to Naionra/Gaelscoil</td>
<td>Y/N</td>
</tr>
</tbody>
</table>
Appendix C
### Home Programme Project – Parental Questionnaire

Please answer the questions on a scale of 1-5 where:

1=Strongly disagree  
2=Disagree  
3=Neither agree nor disagree  
4=Agree  
5=Strongly agree

<table>
<thead>
<tr>
<th>Case number:</th>
<th>Initials:</th>
</tr>
</thead>
</table>

1. I think my child is aware of their speech delay/disorder

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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2. My child’s speech delay/disorder affects conversation between us as parents and child

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<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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3. My child’s speech delay/disorder affects conversation with extended family

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<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
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</table>

4. My child’s speech delay/disorder affects their interaction with friends/peers

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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5. My child’s speech delay/disorder affects conversation with people they do not know

<table>
<thead>
<tr>
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<th>1</th>
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<th>3</th>
<th>4</th>
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6. I am concerned about my child’s speech delay/disorder

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<tr>
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<th>3</th>
<th>4</th>
<th>5</th>
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</table>
Appendix D
Home Programme Project – Parental Questionnaire

Please answer the questions on a scale of 1-5 where:

<table>
<thead>
<tr>
<th>1=Strongly disagree</th>
<th>2=Disagree</th>
<th>3=Neither agree nor disagree</th>
<th>4=Agree</th>
<th>5=Strongly agree</th>
</tr>
</thead>
</table>

1. The home programme was beneficial for my child.
   1  
   2  
   3  
   4  
   5

2. I think my child’s speech has improved over the last five weeks.
   1  
   2  
   3  
   4  
   5

3. I think my child is a more confident communicator now.
   1  
   2  
   3  
   4  
   5

4. Other people have commented that my child’s speech has improved over the last five weeks.
   1  
   2  
   3  
   4  
   5

5. My child enjoyed the programme.
   1  
   2  
   3  
   4  
   5

6. I enjoyed doing the programme with my child.
   1  
   2  
   3  
   4  
   5

7. The instructions provided were adequate to carry out the programme.
   1  
   2  
   3  
   4  
   5

Case number:
Initials:
8. The materials provided were adequate to carry out the programme.
   1 2 3 4 5

9. It was easy to find time to do the programme with my child.
   1 2 3 4 5

10. I spent more one-to-one time with my child because of the programme.
    1 2 3 4 5

11. I will continue doing these activities with my child.
    1 2 3 4 5

12. The activities are useful to do with my other children (if applicable).
    1 2 3 4 5

13. I felt confident using the programme with my child.
    1 2 3 4 5

Any other comments or feedback?

Thank you for completing the programme.

We hope that it was a positive experience for you and your child.
Appendix E
Do you know a child who has speech sound difficulties?

Final year Master’s students in Speech and Language Therapy in the Department of Clinical Therapies are looking for parent volunteers to test a new program of stories and activities that should help children’s speech sounds to develop.

If you have a child aged between 3 and 5 who has difficulties with speech sounds, or you know someone who does, and would like to know more, please ring 0864478771.

Primary researcher: Aileen Wright aileen.wright@ul.ie.
Appendix F
Is your child’s speech hard to understand?

Would you like to take part in a program that might help?

Speech and Language Therapists in the Department of Clinical Therapies at UL are looking for parent volunteers to test a new program of stories and activities that should help children’s speech sounds to develop.

If your child is aged between 3 and 5 and he or she has difficulties with speech sounds, you could take part.

Interested? Ring or email Aileen Wright: 061 234234, aileen.wright@ul.ie, to find out more.
Appendix G
Parent Information Sheet

Study title: A novel home program for children with speech sound disorders

We would like to invite your child to take part in a research study. Before you decide you need to understand why the research is being done and what it would involve for your child. Please take time to read the following information carefully. Talk to others about the study if you wish.

Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?
Children with speech sound disorders are the biggest group of children who present for Speech & Language Therapy Services. At the moment they often spend a long time on waiting lists before they get treatment. The purpose of this study is to find out if a new treatment program that can be carried out by parents is effective.

Why has my child been invited to take part?
Thirty to forty children will take part in this study. Your child has been chosen because:
  * He/she has difficulty with speech sounds
  * He/she is in the age range of the study: 3 to 5 years.

Do I have to let my child take part?
It is up to you to decide. We will describe the study in this information sheet. We will then ask you to sign a consent form to show you have agreed to take part. You are free to withdraw at any time, without giving a reason. This would not affect any services you or your child receives.

What will happen to my child if we take part?
Your child will be given some tests by the researchers, who are final year student SLTs under the supervision of a qualified Speech & Language Therapist. These tests will include activities such as asking your child to name pictures, to repeat words and sentences, to find matching pictures and to point to the correct picture. This will take about 30 to 40 minutes.

These tests will be carried out three times: first to get a picture of your child’s speech difficulties. Then again after five weeks, so we can see if your child’s speech is getting better without treatment. At this session you will be given the program, which is a mixture of stories and activities that you do with your child for about 15 minutes every day, six days a week for five weeks. You will also be given a diary to fill in to say which activities you did. After the five weeks of the program we will test your child again to see if his/her speech is better.

Are there any disadvantages or risks in taking part?
There are no risks to your child. A disadvantage is that your child might become more aware of his/her speech difficulty. However the activities are designed to be fun for the child and to present speech difficulties in a fun way.
Are there any benefits in taking part?
Your child will receive a very thorough speech assessment and you will get a program that should help improve your child’s speech. The information we get from this study should help improve the treatment of children with speech sound difficulties in the future.

What happens when the research study finishes?
After all the results have been collected, the researchers will write the study up. The results will be analysed and shared with other Speech & Language Therapists to help them decide the best way to treat children with speech sound difficulties. We will give you a summary report of the findings regarding your own child. You may request a copy of the report of all the findings at the end of the study. Your child will not be identified in any research report or publication.

Will my child’s taking part in the study be kept confidential?
Yes. All information which is collected about your child during the course of the research will be kept strictly confidential, and any information about him/her which leaves the clinic will have the name and address removed so that he/she cannot be recognised. You have the right to check any data held about your child for accuracy and correct any errors.

What will happen if I don’t want my child to carry on with the study?
You can take your child out of the study at any time, without giving a reason. This will not affect any services you or your child would normally receive.

What if there is a problem?
If you have a concern about any aspect of this study, you should ask to speak to the principal investigator who will do her best to answer your questions (Aileen Wright, 061 234234). If you remain unhappy and wish to complain formally, you can do this through the EHS Research Ethics Committee (contact details below):

Who is organising and funding the research?
The research is being carried out as part of final year Speech & Language Therapy students’ Master’s thesis under the supervision of a lecturer and qualified SLT at the University of Limerick in Castletroy.

Who has reviewed the study?
All research in the University is looked at by independent group of people, called a Research Ethics Committee to protect the safety, rights, wellbeing and dignity of those taking part. This study has been reviewed and given favourable opinion by the University of Limerick Research Ethics Committee. If you have concerns regarding this study, please contact: Chairman, Education and Health Sciences, Research Ethics Committee, EHS Faculty Office, University of Limerick, Tel (061) 234101 Email: ehsresearchethics@ul.ie

Further information and contact details.
For further information please contact the researcher, Aileen Wright (061 234234, or aileen.wright@ul.ie).

Thank you very much for taking the time to read this information sheet. We will be very grateful if you decide to let you child take part in the study.

If you decide to let your child take part in the study, please sign the attached consent form and return it to Aileen Wright, Department of Speech & Language Therapy, Health Sciences Building, University of Limerick, Limerick. You will then be contacted by phone to arrange an appointment.
Appendix H
Calculating percentage consonants correct

1. Subtract the number of consonants not elicited (i.e. in words not said) from the total number of consonants in the target form. This gives you \( b \), total consonants targets.

2. Match the child’s form to the target form. Count the number of consonants that do not coincide with the target in the child’s sample. This gives you \( c \), total consonants in error.

3. Subtract \( c \) from \( b \), this gives you \( d \), total consonant correct.

4. Divide \( d \), total consonants correct, by \( b \), total consonants targets, then multiply by 100. This gives you percentage consonants correct.
Appendix I
### What is Let's Talk?

*Let’s Talk* is a pre-school speech program designed for parents and carers of children who are having difficulty with speech sounds. Each issue contains:

- “mixed up” stories
- sound stories
- scrapbook activities
- nursery rhymes
- other activities

### What do we need?

- Your copies of Let’s talk
- A scrap book
- Crayons or markers
- Scissors and glue stick
- Old magazines, Argos catalogue

### You are your child’s best teacher

As parents, you are the most important people in your child’s early development. By trying a few simple ideas, you can really help your child’s speech to develop.

### How much time does it take?

You should aim to spend 15 minutes a day, 6 days a week reading the stories and doing the activities with your child.

*Don’t try to do all the activities in each issue each day, pick one or two. Do read at least one “mixed up story” every day.*

Keep it fun! Your child doesn’t need to talk, just listen.

### Important points!

Your child has a phonological problem. This isn’t a problem with saying the speech sounds, it is a problem with recognising which speech sounds she or he needs, in order to make a difference between words, and where they go. Please do not correct your child’s speech during this program, it should start to change by itself, but that may take some time. Use **modelling and recasting**, explained on page 3, instead. As your child hears you using the sounds in one-to-one activities, they will work out how to say them themselves. Read further to find out how the activities work.
**The Activities**

**Modeling & Recasting**
Read this first. It explains how to help your child develop better speech without correcting them. Use modelling all the time, and Recasting 3 or 4 times a day.

**Mixed-up stories**
These are stories about children or animals who have a speech difficulty. It shows how people get mixed up when you say the wrong words. Listening to these stories frequently will make your child realise which sounds go together to make a difference between words, so they can get their message across. Try to read one every day.

**Nursery Rhymes**
The rhythm, rhyme and repetition of words in nursery rhymes and songs helps children develop speech sounds, vocabulary and basic concepts. The ability to rhyme is very important in learning to read. And children love them! Saying nursery rhymes with your child gives them a headstart to great listening and reading skills.

**Sound stories**
An activity to develop your child’s ability to learn more about sounds, what they should sound like, and to recognise words that start with the same sound. An important skill for reading.

**Sounds different**
Activities to help your child hear and discriminate speech sounds accurately. If they can’t hear the sound properly, they won’t be able to say it. This ability is also very important for learning to read and spell later.

**Resource Pages** Materials to help you carry out the activities described
Appendix J
Mixed up Marty at the swimming pool:

This is Mixed up Marty, and his friends, Guy, Di, and Fix up Fi.

Today the gang are going swimming at the school pool. It’s a sunny day, but a bit cool.

There’s a shop at the pool, so afterwards they can have Coke and cookies.

They’ll need keys for the lockers to put their clothes in. “Who’s going to get the keys?” says Guy?

“I’ll do it!” says Mixed Up Marty, and he runs off to the shop. “Hi Mr Bob,” he says. “Four teas, please.”
“Okay” says Mr Bob, and fetches four cups of tea.

“Oh no” says Marty, “I didn’t want teas, I want teas”.

“Yes” says Mr Bob. “here are four teas”.

“No, teas for the lotter”

“Yes” says Mr Bob. “Teas for the lot of them”.

“Oh no” says Marty, “help!”.

Luckily, Fix up Fi comes to see what’s keeping him. “Oh I see”, she says. “Marty has mixed up again. He doesn’t mean teas, he means keys for the locker!”

“Oh well, he said teas!” says Mr Bob, grumpily. But he goes off and gets the keys. “Here you are 4 keys for the locker, not 4 teas he says.

Now they have the keys, the gang get changed. Oh dear says Guy, I forgot my swimming togs. I can’t go in the pool!”.

“Don’t worry” says Marty, “we’ll borrow some” and he runs off to Mr Bob.

“Hi Mr Bob. Di has no swimsuit. Do you have one to borrow?”

“Sure” says Mr Bob, and gives Marty a big bag.
Marty runs back to Guy. “See, Mr Bob has spare swim suits. Here’s one for you.” And he gives Guy the bag.

Guy opens the bag and takes out a red and white bikini. I can’t wear this he says! What can they do?

Along comes Fix up Fi. “I can guess what happened” she says. “Mixed up Marty’s done it again. He said the suit was for Di, instead of Guy!”

She goes back and gets a boy’s togs for Guy. Now at last they can all go swimming, thanks to Fix up Fi. Now they’ll have a lot of fun.

Mixed Up Marty said tea when he meant key. And Di when he meant Guy. So everyone got mixed up!
Find other words that Marty might get mixed up:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>tap</td>
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<td>cape</td>
</tr>
<tr>
<td>neck</td>
<td>net</td>
<td>cool</td>
<td>tool</td>
</tr>
<tr>
<td>mug</td>
<td>mud</td>
<td>car</td>
<td>tar</td>
</tr>
</tbody>
</table>

**INSTRUCTIONS**

Cut these pictures out and mix them up. Help your child match the word with its rhyming pair. Say the words as often as you can. This will make your child aware that he needs to use two different sounds to make two different words. Just start with a few pictures at first.
Appendix K
Helping your child develop better speech sounds:

Modeling and Recasting

Speech & Language learning:
All children are language learners.
• Part of their speech and language development happens naturally.
• Part of it is learned through the Modeling of people around them.
• Parent(s) are young children’s main speech and language models.

What is Modeling?

Modeling is when you provide a good ‘model’ or example of how to speak. You model a good example of the speech ‘target.

What is a ‘target’?
A ‘target’ is a speech or language ‘behaviour’ we want to encourage your child to use when communicating: for example a word he or she says wrong.

You are “modeling” when you use in conversation, lots of times, a word that he or she says wrong.

How to be a good model:

Use:
• an unhurried speech rate
• clear speech
• short sentences
• simple vocabulary
• more repetition and re-stating than with an adult

There are many ways to model: see the next pages
Ineffective ways to model:

- C = child  A = adult
- What did the child hear?
- ‘bid’ was heard twice and ‘big’ once
- adult cancelled him/herself out!

- Child tunes out
- Child heard ‘bid’ three times and ‘big’ once (if they were listening)

Pointless Modeling
C: That’s a bid bird.

Exaggerated Modeling
C: Pease can I have one?
A: You mean puh-leeze. Puh-leeze may I have one?

Ineffective Modeling
C: That’s a bid bird.
A: Not a bid bird. You don’t say ‘bid bird’. You have to remember to say ‘big bird’.

Imitating the child
C: I want the wed one pweeze.
A: You want the which one pweeze?

“Modeling” with NO model!
C: He hurt his weg.
A: Hurt his weg? What are you supposed to say?

Didactic Modeling
C: Tan you det it?
A: Not tan you det it. Can you get it. You say it: can you get it.
C: Tan you det it.

In these examples NO speech model has been provided.

Followed by short talk on ‘can’, ‘tan’, ‘get’ and ‘det’ — sigh!
Modeling just once:

This is the way parents typically ‘model’ when their child makes a speech error. The adult ‘recasts’ what the child says …ONCE

It ‘comes naturally’ to model this way;
It is OK for a ‘typical’ language learner but not ‘powerful’ enough for a child with a speech sound difficulty.

😊😊😊😊😊 Effective conversational Modeling

The following examples are of ways to model effectively when speaking to children who are having difficulties with speech sound development.

😊😊 Modeling corrections

C: I like his punny pace.
A: I like his funny face too. It’s a really funny face. A funny face. Do you know what that guy with the funny face is called?

C: Det it down!
A: Get what down? Oh, get this down? OK. I’ll get it for you. I think I can reach. Uh-huh, I can get it.

😊😊😊😊😊 Recasting

The term ‘recasting’ means repeating a sentence with a mistake in, but with the mistake corrected. Recasting when a child says a word incorrectly provides a Modeling correction

- without overt criticism
- without interrupting the ‘flow’
- without getting in the way of listening

😊😊 Frequency of recasting

• aim for 12 to 18 “recasts” per minute
• for 3 or 4 minutes of a day
• for the SAME word
• or for the SAME sound pattern

How to make it frequent:
12 TO 18 RECASTS: Twelve to eighteen can seem rather a lot! This is how you do it, making sure you choose a relevant target for your child (e.g., don’t recast "cow" many times while your child is chatting about "keys"/ "teas")!

Child: Him's tar talled Batmobile.
Adult: His car? (1) His car's (2) called Batmobile? That's a strange name for a car (3). Our car's (4) a Toyota. Our car's (5) not a Batmobile!
You have a lot of cars (6) there! Is one of those cars (7) a Batmobile?
Child: This tar is. It he's Batmobile tar.
Adult: This car (8). Oh! This car's (10) the Batmobile car (11).
Not this car (12), not this car (13), not this car (14), not this car (15), it's THIS car (16). May I play cars (17) with you? Who's driving the Bat car (18)?
Child: Me drive Bat tar ... car
Adult (thinks): RESULT!

(Please note: you won’t get a result every time, and it may take days or weeks before your efforts start to bring results, so don’t expect too much too soon. Progress will be gradual.)

To get your recasts "in" you can use a bit of nonsense at times ("Oh I do love this little car-car-car-cardee-car-car-car-car... It’s my best car-car-car-cardee-car-car. It’s the best car-car-car-cardee-car-car-car on the road! (that's 18!). You can also use songs and rhymes (Take me riding in your car-car...).

This handout was adapted from “Facilitating Language Learning” by:

Caroline Bowen PhD at www.speech-language-therapy.com
Appendix L
Instructions

Carrying out the program

- Try to spend 15 minutes each day using the program with your child in a one-to-one situation. Please read at least one of the stories to him/her and carry out one of the activities each day. Let your child choose the story or activity as much as possible, but try and spend some time on the stories that demonstrate difficulties like those she/he has a few times a week.
- If your child would like to read lots of stories or do lots of activities, that is fine! Just take into account that you need to keep his interest for five weeks.

Filling in the diary

- Please fill in the diary each day with the name of the story or stories you read and activity you did. Please also add any comments about things like whether your child enjoyed the activity, or whether you felt it was suitable.
- If your child is sick or out of sorts, or if you have to miss a day for any reason, please just note this in the diary so we know how much time your child spent on the program.
- Please fill in a comment also whenever you see signs of progress, for example if you hear your child use a new sound, or if a relative comments that they can understand him/her better, or if your child shows more confidence, e.g. speaking on the phone or to a stranger for the first time.

Using the star chart

- We have given you a star chart so you can put a star or sticker in each day that the child does something in the program. If your child is hard to motivate, you might use a little reward, such as an outing to the park or something nice to eat, every time they get a certain number of stars.

Have any questions or need some advice?

- Please ring 086 4478771 or contact aileen.wright@ul.ie if you need any help or advice.
<table>
<thead>
<tr>
<th>Week 1</th>
<th>What you did you do today? (which stories or activities)</th>
<th>Comment: (e.g. enjoyment, progress, setback)</th>
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<tr>
<td>Day 1</td>
<td>Time spent:</td>
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<td>Day 2</td>
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<td>Time spent:</td>
<td></td>
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<td>Day 6</td>
<td>Time spent:</td>
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Appendix M
<table>
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<th>Week 1</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
<th>Day 6</th>
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Appendix N
Table 5: Further information on each case

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<th>Case no.</th>
<th>Parent’s comments</th>
<th>Additional information</th>
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<tbody>
<tr>
<td>1</td>
<td>Child’s motivation poor, sick for 1 week. Connected speech perceived as most improved</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>Child loved the HP. Child really understood the concept in the stories</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>Found it difficult to find time to do the HP. Child is now more fluent and trying to say more difficult words</td>
<td>N/A</td>
</tr>
<tr>
<td>4</td>
<td>N/A</td>
<td>Resource Teacher carried out the HP</td>
</tr>
<tr>
<td>5</td>
<td>Connected speech perceived as much improved</td>
<td>N/A</td>
</tr>
<tr>
<td>6</td>
<td>N/A</td>
<td>‘Sore ears’ reported in the diary for first 2 weeks of HP. Grommets inserted during week 4 of HP.</td>
</tr>
<tr>
<td>7</td>
<td>N/A</td>
<td>May need grommets, enlarged adenoids</td>
</tr>
<tr>
<td>8</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>9</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>Found it difficult to do both group therapy &amp; HP</td>
<td>Child receiving group language therapy as well.</td>
</tr>
<tr>
<td>11</td>
<td>Noticed most speech improvement during last 2 weeks of HP</td>
<td>N/A</td>
</tr>
<tr>
<td>12</td>
<td>Child doesn’t like the sounds (Story &amp; activity targeting her speech error process)</td>
<td>N/A</td>
</tr>
<tr>
<td>13</td>
<td>Improvement in child’s production of /s/, /l/ and /f/. Found it difficult to find time to do the HP at times</td>
<td>N/A</td>
</tr>
</tbody>
</table>