Introduction

School-aged children with specific language impairment (SLI) have difficulties with many areas of language, including particular areas of grammar. It is known that SLI can be persistent with follow up studies finding that children with early language impairment show long-term deficits in language, academic and cognitive domains, few studies have been published that investigate language intervention with school-aged children with SLI, that is those children over 5 years of age.

Intervention with younger children often use methods that teach grammatical rules implicitly, reported effects of these methods have generally been positive with evidence found in case studies and larger scale studies. These methods go with the assumption that children will be able to learn the rules of language in the normal way if the frequency and salience of target forms are increased. When grammatical difficulties persist and it becomes clear that the child cannot learn language implicitly, therapists must try alternative methods to facilitate language learning.

Metalinguistic approaches to learning grammatical rules have been reported in the literature, for example, The Colour Pattern Scheme reported by Lea\(^6\) details the use of colour coding parts of speech to help children produce written language. Bryan\(^6\) created the Colourful Semantics system which also uses colour coding in order to help children identify thematic roles and create a variety of argument structures. Despite metalinguistic approaches such as these being reported, there is little evidence of their efficacy and no studies which use experimental controls.

Ebbels\(^4\) notes that these methods are limited to the use of simple sentence structures which are less useful to older children. She created the Shape Coding system which has the ability to code for more complex structures and verb morphology.

The Evidence Base

**Intervention Study 1- Ebbels & van der Lely, (2001)\(^7\)**

<table>
<thead>
<tr>
<th>Targets</th>
<th>Participants</th>
<th>Controls/Groups</th>
<th>Hours of therapy</th>
<th>Maintenance of progress</th>
<th>Generalisation results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehension and expression of wh-questions and passive formation.</td>
<td>Age 11-13</td>
<td>Severe receptive and expressive language impairment (RELI).</td>
<td>4 case studies. Multiple baseline.</td>
<td>10 hours on passive, 20 hours on wh-questions.</td>
<td>After 30 weeks: passive for 2, wh-questions for 1.</td>
</tr>
</tbody>
</table>

**Results:** 3/4 participants showed significant progress in production and comprehension of passives. 2 children had difficulty with comprehension of wh-questions, they improved significantly. All children made gains in production of wh-questions, this reached significant for 3 children but only for object questions.

**Comments:** The results of this paper may be questioned due to the fact it is a very small scale study. Whilst some progress was evident the significance and maintenance varied between participants. Lack of a control measure or generalisation measure also question the validity of the results. The reasons behind varying results are discussed.

**Intervention Study 2- Ebbels (2007)\(^4\)**

<table>
<thead>
<tr>
<th>Targets</th>
<th>Participants</th>
<th>Controls/Groups</th>
<th>Hours of therapy</th>
<th>Maintenance of progress</th>
<th>Generalisation results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehension of the dative form.</td>
<td>12-14 years Severe RELI.</td>
<td>3 case studies 1 school term.</td>
<td>Not measured.</td>
<td>Not measured.</td>
<td></td>
</tr>
</tbody>
</table>

**Results:** 2 children scored 0% pre therapy and 100% post therapy, unable to calculate significance. 1 showed unreliable comprehension, his pre and post therapy scores did not differ significantly, possible auditory memory problems?

**Intervention Study 3- Ebbels, van der Lely & Dockrell (2007)\(^3\)**

<table>
<thead>
<tr>
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<th>Maintenance of progress</th>
<th>Generalisation results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb argument structure.</td>
<td>11-16 years Persistent RELI.</td>
<td>RCT</td>
<td>4.5 months, excluding gains in optional arguments.</td>
<td>Significant to 3 months follow up.</td>
<td></td>
</tr>
</tbody>
</table>

**Results:** Pupils in both the syntactic-semantic and semantic therapy groups made significantly greater gains in their overall ability to link arguments to syntax than the pupils who received the control therapy. Shape coding had the additional benefit of increasing the number of optional arguments used, this was non-significant. A control measure did not improve.

**Comments:** RCTs are seen as double blind as they provide a conservative bottom-line judgement of the effectiveness of intervention therefore this method of research is seen as of relatively high quality. Its use of blind assessment, a control group and measure and generalisation item adds value to its results. The number of participants is small and the effects of intervention were reduced at the follow up stage Generalisation to discourse was not assessed.

Conclusions

- The Shape Coding system can be effective for some school-aged children with SLI for learning verb argument structure, the dative form, wh-questions (including comparatives), passives and the past tense.
- Looking at individual cases it is clear that it is not successful for all children.
- The research is limited mainly to single case studies and these are limited as they report on same children, making it more inappropriate to generalise the findings.
- There is a lack of evidence around the generalisation and maintenance of taught structures.
- An RCT showed that therapy focussing just on the semantic properties of verbs was just as effective at teaching children with SLI the linking of arguments to syntax as the Shape Coding system which also focuses on syntax.
- The finding that the gains made by the children in using optional arguments was not maintained may suggest that changes in syntax may need more therapy time.

Implications

- The shape coding system can be effective for some children and is very flexible.
- There is little high quality evidence for its effectiveness so it is important that therapists monitor the individual child closely to determine whether the chosen method is suitable.
- Some children were seen to need additional therapy in a pair after not responding well to group intervention.
- Good visual perceptual skills are needed for Shape Coding.
- The positive results that have been found argue that therapists can and should work with older children.
- Older children will be in need of functional communicative goals to help them cope with their language difficulties as well as those that are impairment based.

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