Pennine Care NHS
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Newcastle University

BEST

Building Early Sentences Therapy

The BEST Manual

Winner of the Sternberg Award for Clinical Innovation

Dr Cristina McKean,
Dr Sean Pert & Dr Carol Stow

Building Early Sentences Therapy Manual

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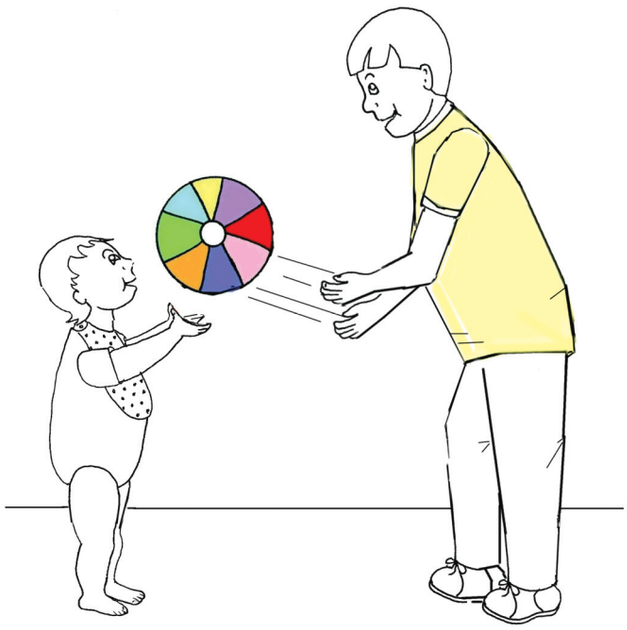
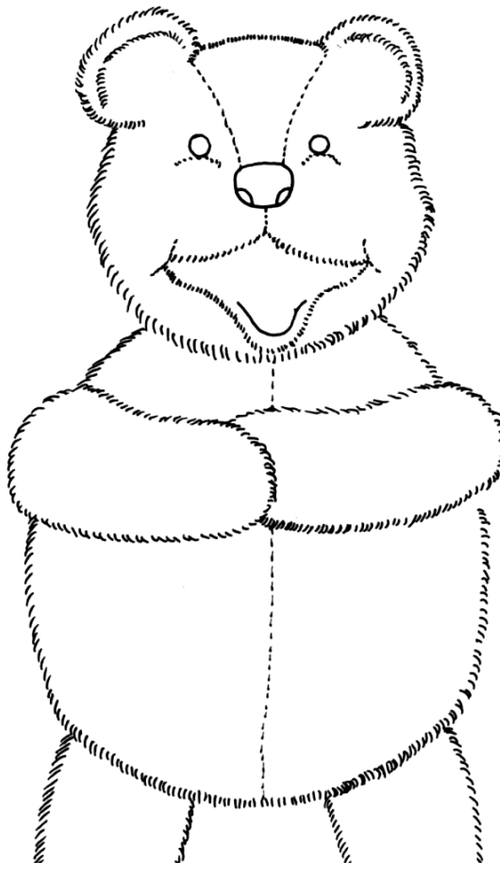


A Home Language, Early Intervention Programme for Young Children with Severe Language Difficulties.



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The BEST programme: An overview

The *Building Early Sentences Therapy* programme (BEST) is a language intervention programme for children with severe language difficulties, delivered by a speech and language therapist (SLT) and speech and language therapy assistant (SLTA).

The SLT and SLTA must have completed the BEST programme training. A knowledge of Paget Gorman Signed Speech (PGSS) is desirable, but not essential as this will form part of the BEST programme training.

The BEST programme is suitable for children aged between 3;0 and 6;0 years of age.

The BEST programme is designed to be delivered to small groups of between two and six children. It is designed to be delivered in English to children who are experiencing severe language difficulties in English as their home language.

The B-BEST is available for children with Pakistani heritage or Bangladeshi heritage home languages.

The entire programme (*eligibility assessment to outcome assessment* inclusive) takes a minimum of eleven sessions and a maximum of twenty two sessions. It is recommended that sessions be delivered at regular intervals, (according to service restrictions) with once or twice weekly being the most common pattern of delivery. There are built-in decision points to evaluate the child's progress. Children leave the BEST programme when they have achieved the aims on their care plan.

The BEST programme differs from other language interventions in several key areas:

- The approach is input based – the children hear spoken sentences matched with small toys acting out the sentence to help them match the language to the event and actions.
- The children listen to learn. The children are given opportunities to join in in a safe environment, but expressive language is not expected, especially at the early stages of the programme.
- The children are not imitating, repeating or copying spoken sentences. The children are given examples but asked to produce their own spoken sentences. In this way, the children are able to abstract language structures and generalise their skills, rather than rote-learning specific sets of actions.
- Comprehension is expected to develop alongside expression. No specific activities target verbal comprehension. This is in-line with the theoretical basis of the programme and evidence of how typically developing children learn language.

The BEST programme is delivered in partnership with the child's parent(s)/carer and homework booklets are included in the package. The homework involves the adult saying spoken sentences and the child listening to learn.

The BEST programme is based on current linguistic theory (constructivist theory) and supporting evidence is available on the web site: *www.b-e-s-t.org.uk*

Stage	Professional	No. of sessions for this stage	Session number
Eligibility assessment	SLT	1	1
Pre-treatment assessment including: BEST Baseline assessment; Care plan; Comprehension baseline	SLT	1	2
Therapy sessions	Two SLTAs or SLT and SLTA	8	3-10
Decision point 1	SLT	1	11 *Possible exit point*
Therapy sessions	Two SLTAs or SLT and SLTA	4	12-15
Decision point 2	SLT	1	16 *Possible exit point*
Therapy sessions	Two SLTAs or SLT and SLTA	4	17-20
Outcome assessment	SLT	1	21
Consolidation period	Parent(s)/guardian and/ or setting/school staff	Daily	6 weeks
Post-treatment review	SLT	1	22

Table 1. BEST programme timetable

BEST principles

'Usage based' or 'constructivist' theories suggests that children learn language by:

- Listening to language spoken by others around them
- Rote-learning short, simple and inflexible spoken utterances in play and everyday routines
- Building (or constructing) abstract categories and language structures, over time, through finding patterns in the language that they hear and the sentences they can use

Children must therefore hear a high *quantity* of *quality* language input. This may be impeded by environmental and socioeconomic deprivation, or sensory impairment (such as hearing loss).

Children also require the processing ability to analyse the vast amounts of data provided by the language they hear around them. They must be able to identify language patterns. Children who have difficulty with this may present with language impairment. Children with cognitive difficulties will find the processing of the language data more challenging and therefore acquire language at a slower rate.

Finally, children must be interested in the activities of others and hear the language paired with the activities they observe. Children with social communication difficulties may have difficulty pairing the pragmatic function to the language they hear.

Rather than teach the child a set of spoken sentences or verbs, BEST aims to help the child to develop a model of how spoken sentences are formulated. In this way the child can generalise rather than having to learn each new sentence structure individually. Having learnt the underlying principles of how language is mapped onto a sentence frame, the child is then ready to attempt to use spoken sentences which they have generated for themselves.

BEST aims to develop abstract representations of sentences in the child's language system, an achievement which is thought to accelerate future language development. To achieve this BEST manipulates the language the child hears in the following ways:

- **Variation:** Changing one element of the spoken sentence within a set.
- **Contrast:** Pairing sentences with different verbs but similar sentence structures in a set.
- **Signing and consistent morphological 'frames':** Giving visual cues and consistent 'sentence frames' to highlight morphology and help the child to spot patterns in the input.
- **Repeated input:** Giving the child numerous examples of the sentences in a meaningful context, in therapy and at home.
- **Distributed sentence patterns:** Presenting the child with different sentence types within a session and over the course of the therapy.

Each of these strategies is an essential component of the BEST approach. This also means that the therapy is not staged from simple to complex. It is helpful for the child to hear spoken sentences from a range of sentence types during the course of the therapy and the child does not need to succeed at producing one type of sentence before moving on to more complex sentences.

Who is **BEST** for?

- Children aged 3 to 6 years
- Delayed language (including disordered language)
- Mixed receptive-expressive or expressive language difficulties
- Monolingual or bilingual

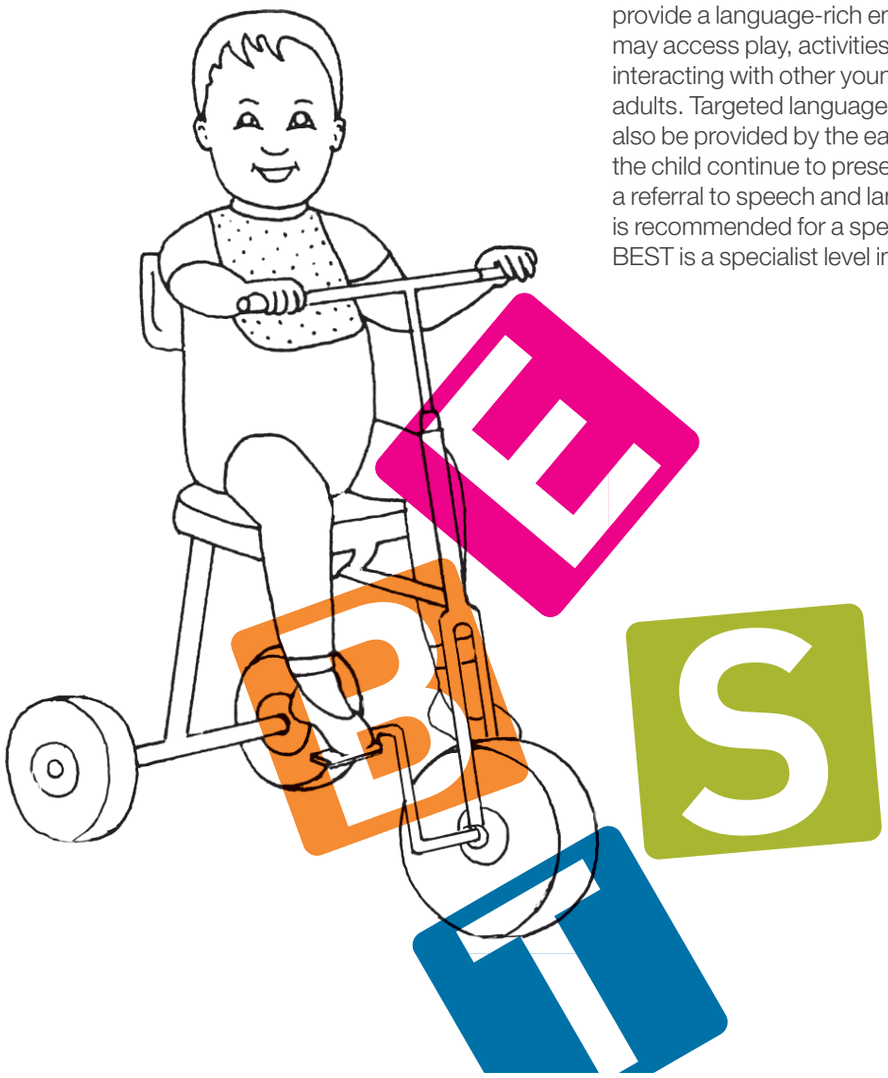
Who can deliver **BEST**?

Anyone who has received BEST training. Training is available to SLTs and SLTAs.

Educational staff such as teaching assistants may deliver BEST under the supervision of a BEST-trained speech and language therapist.

Where does **BEST** fit into SLCN provision?

BEST is a specialist level package for children with identified and significant needs who require specialist interventions (Bercow, 2008, Royal College of Speech & Language Therapists, 2006).



In which language should I deliver **BEST**?

BEST resources have been developed for the following languages:

- English
- Pakistani Heritage Languages:
  - Mirpuri
  - Punjabi
  - Urdu
- Bangladeshi Heritage Language:
  - Sylheti

It can be delivered to children with either monolingual or bilingual backgrounds. In order to decide the appropriate language for the delivery of BEST the SLT should complete a language case history and discuss the recommended therapy input language with the child's parent(s)/carer. See the B-BEST manual for further guidance.

Where does **BEST** fit into a language care pathway?

It is suggested that, where there is concern about a child's language skills, the family is encouraged to access universal provision. Universal provision will provide a language-rich environment where children may access play, activities and opportunities for interacting with other young children and supportive adults. Targeted language stimulation packages may also be provided by the early years setting. Should the child continue to present with language difficulties, a referral to speech and language therapy services is recommended for a specialist level intervention. BEST is a specialist level intervention.

Language Structures

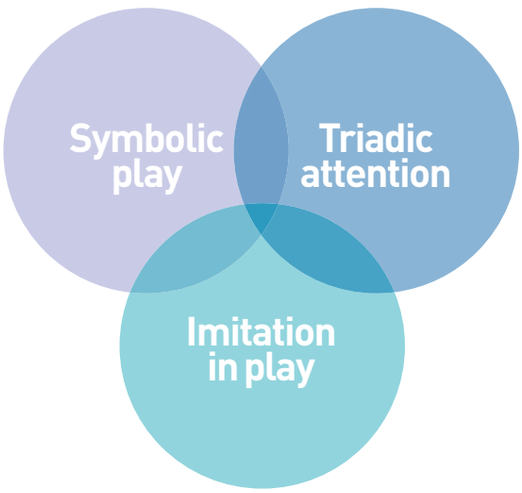
In English, BEST targets the following:

Number of Arguments	Set	Argument Structure	Input	Output
1	A	Agent + Action	*laughing*	**sitting**
1	B	Agent + Action	*jumping*	**walking**
2	C	Agent + Action + Patient	*eating*	**washing**
2	D	Agent + Action + Patient	*riding*	**smelling**
2	E	Agent + Action + Patient	*kissing*	**hugging**
2	F	Agent + Action + Patient	*kicking*	**brushing**
3	G	Agent + Action + Patient + Locative	*putting*	**putting**
3	H	Agent + Action + Patient + Locative	*pouring*	**pouring**
3	I	Agent + Action + Patient + Locative	*putting*	**pouring**
3	J	Agent + Action + Patient + Benefactive	*giving*	**giving**
3	K	Agent + Action + Patient + Benefactive	*throwing*	**throwing**
3	L	Agent + Action + Patient + Benefactive	*giving*	**throwing**

Table 2. BEST target structures and verb pairs.

In other languages, analogous two to four clause structures are used.

Signing is recommended as a supporting visual model of the structure being presented to the children. Paget Gorman Signed Speech is recommended as this system includes signs for the grammatical and morphological frame as well as content words.



BEST Entry Criteria and Eligibility Assessment

BEST should form part of the assessment and treatment package for children with severe language difficulties. It is therefore expected that an initial assessment, including observations, a range of formal and informal assessments and a full parent interview (case history) will have been undertaken.

As part of the assessment process, the BEST Entry Criteria and Eligibility Assessment is available. This examines the child's play, imitation and social interaction skills, together with a short screen of the child's expressive language abilities. Where a child fails any of the non-verbal criteria necessary for them to access BEST (see left), consider a referral for a broad based multidisciplinary developmental assessment.

Figure 1. Non-verbal skills necessary to access BEST (left).

The **BEST** package

Therapy aims

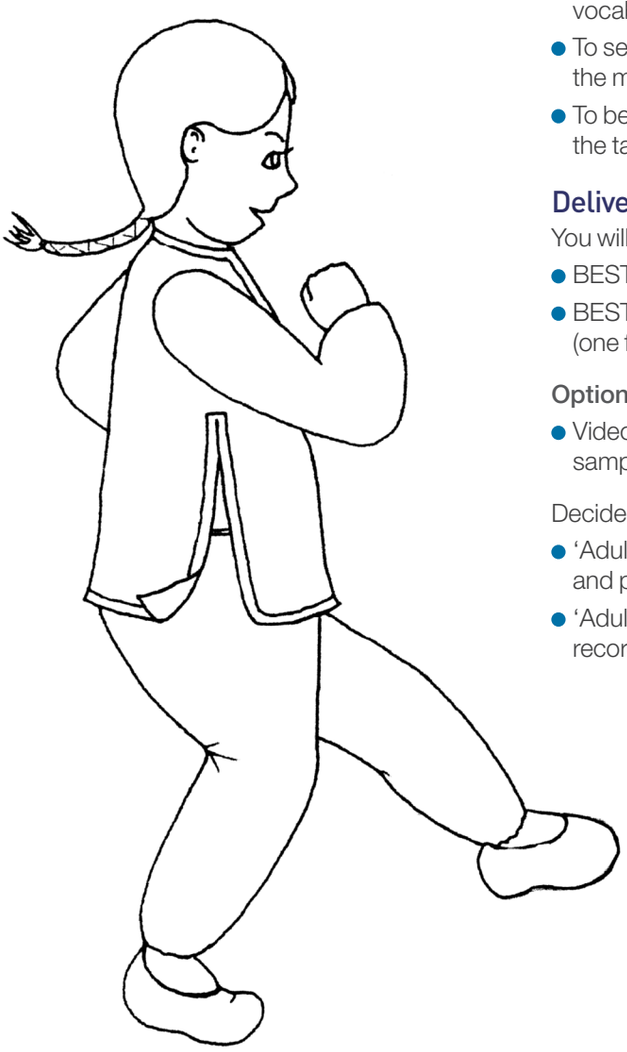
There will be a written care plan for each child based on the needs identified in the *BEST Baseline Assessment*. The care plan states the child's aims to be achieved **by the end of the BEST programme**. The care plan should be written by the SLT and discussed with the other staff providing the BEST therapy group. The care plan should be agreed with the parent(s)/carer and where appropriate, the staff at the child's setting/school.

Aims are set from the following categories:

- Syntactic targets
- Vocabulary targets
- Grammatical targets
- Action (verb) targets
- Phrase level targets
  (Noun Phrases and Verb Phrases)

The possible aims for the child are listed in *BEST Care Plan Treatment Aims*.

Note: The aims for each session are not the same as the aims for the *whole* of the BEST programme (see right).



Session aims

The BEST programme is designed to meet the child's needs over the course of the sessions. The child is not expected to provide error-free spoken sentences in each session. Successful spontaneous spoken sentences are the overall aim by the end of the BEST programme, with the emphasis on *spontaneous production* by the child.

It is not necessary to facilitate output in every session. This is one of the features of BEST: that children are free to observe and listen until they feel confident enough to attempt a spoken sentence themselves.

For this reason, SLTs and SLTAs should not use strategies and techniques designed to 'scaffold' success within a particular therapy session, e.g. forced alternatives.

In this way, the child learns to use underlying language structures, rather than echoing or rote-learning a specific set of spoken sentences. This should ensure better generalisation and more efficient language acquisition.

The aims for each session are as follows:

- To hear target sentences used with varying vocabulary and paired with contrasting verbs
- To see PGSS in order to support the child to 'notice' the morphological structure of the sentence
- To be given the opportunity to attempt to produce the target sentences

Delivering the therapy group

You will need:

- BEST toy box
- BEST Assessment and Therapy Record Booklet (one for each child)

Optional items

- Video and/or audio recorder (for analysing language samples, showing parent(s)/carer, or self-evaluation)

Decide who will carry out the following roles:

- 'Adult A' – the person manipulating the toys and providing spoken sentence models
- 'Adult B' – the person providing PGSS and recording the children's spoken sentences (if any)

Step	Adult A	Adult B
Step 1: Introduction of noun vocabulary	1. Take the toys out of the bag and place them on a table in easy reach of the child saying "I've got a..." 2. If the child doesn't name after a short gap, then name the toy. Do not ask "What's this?" 3. Repeat with all objects for the set. Note: it is not essential for every child to name every object. If any child clearly labels an object, repeat this to reinforce and move onto the next object.	
Step 2: Input phase	1. Say: "Let's see what the people are doing". 2. Carry out the action with the toys and give a verbal model at the same time. 3. Repeat until all of the sentences have been presented to the children.	Provide a supporting visual model using PGSS while the action is taking place.
Step 3: Output phase	1. Carry out the first action with the toys. 2. Help Child 1 to carry out that action with the toys. Child 1 is not required to speak at this point. 3. Help Child 1 to repeat/continue the action while Child 2 is attempting to describe the action. 4. Repeat for each of the output sentences in the given set with the children's roles moving clockwise around the semi-circle of children (i.e. For sentence one: child 1 carries out the action while child 2 gives output. For sentence two: child 2 carries out the action while child 3 gives output).	1. While Child 1 is carrying out the action ask Child 2 "What's happening?" 2. However the child responds, this attempt is accepted by the adult who recasts this attempt – "Yes.....the teddy is washing the apple". **The child is not asked to repeat this recast**. 3. Record the child's first response in the recording form. (Spontaneous responses of other children in the group should also be recorded.) Note: Do not give forced alternatives, scaffolded models or demand an imitated response or eye contact from the child. Additional verbal praise is also not necessary.
Repeat the 3 steps above for the remaining 2 sets required for this session		

Table 1. BEST programme timetable

Adapting the session for a one to one session

The BEST package is designed to be delivered to a small group of children because of the advantages this brings. Children benefit from playing and talking together in a social context. Children observe their peers using language and experimenting with spoken sentences. In addition, the delivery by two adults allows the child to see the spoken sentences (as PGSS signs) at the same time they hear the spoken sentences.

If only one child on your caseload requires the BEST package, BEST may be delivered in a one-to-one context, although this is the least preferred method. Several therapists may find it advantageous to cooperate in order to deliver BEST to a group of children.

To deliver BEST, follow the same steps as outlined in the table.

- Deliver *Step 1: Introduction of noun vocabulary* in the same way as for the group therapy session.
- For *Step 2: Input phase*, after demonstrating the action with the toy(s), model the PGSS for each spoken sentence.
- For *Step 3: Output phase*:
    1. Carry out the first action with the toys.
    2. Help the child to carry out that action with the toys. The child is not required to speak at this point.
    3. Ask the child "What's happening?"
    4. Help the child to repeat/continue the action while they describe the action.
    5. However the child responds, this attempt is accepted by the adult who recasts this attempt – "Yes……the teddy is washing the apple". **The child is not asked to repeat this recast**.
    6. Record the child's first response in the recording form. (Spontaneous responses of other children in the group should also be recorded.)
    7. Repeat for each of the output sentences in the given set.

    Note: Do not give forced alternatives, scaffolded models or demand an imitated response or eye contact from the child. Additional verbal praise is also not necessary.

Working in partnership with parents

Giving feedback to parent(s)/carers

'Success' for a session, especially for the first therapy sessions will include that the child has:

- Been interested in looking at the toys
- Played with the toys
- Looked at the toys and then the adults when hearing the spoken sentences
- Looked at objects when they are named or referred to

The child may also have imitated some of the PGSS signs. Use of PGSS by the child is **not** the ultimate aim of BEST but any use during intervention is positive and adults should recast these responses as though they are a verbal response. They should not, however, directly prompt the child to imitate the signs. Use of PGSS by the child should be seen as a stepping stone along the way to the ultimate goal of verbal spontaneous use of the target sentences.

The child may or may not have spoken during the therapy session. This should not be viewed as significant, and parent(s)/carers should be encouraged to view the BEST programme as a whole. Advise that the outcome of the programme is established after a minimum of eight therapy sessions and may take up to the full sixteen sessions before the child's expressive language noticeably improves.

Setting homework

There is a homework booklet to give to the parent(s)/carer following each therapy session. There are sixteen therapy sessions. Give the homework booklet corresponding to the therapy session number.

It is important to remind parent(s)/carers that they should not expect or demand spoken sentences from their child.

- Each day the adult will say to the child "Let's look at some pictures together!"
- The adult points to each picture in turn, leaving a short gap to see if the child wants to describe the picture. If the child says nothing, the adult should then say the full spoken sentence.
- Remind the adult that they should not ask the child to repeat the spoken sentences after them.
- Remind the adult that they should praise any and all attempts (e.g. single words) the child offers, but then say the full spoken sentence for the child to hear.
- The homework should not take more than fifteen minutes. If the child loses interest and wanders away, attempt the homework the next day.

Assessment and recording the child's progress

Eligibility assessment

The *BEST Entry Criteria and Eligibility Assessment* examines the skills the child requires in order to benefit from the BEST programme. These are:

- Triadic attention
- Symbolic play
- Imitation in play

It also includes a brief picture assessment to examine the child's expressive language.

There is a reminder to include hearing test results (as a restriction in language input would mean that the child would miss out on the information required to construct spoken sentences).

Each of the three brief assessment areas are assessed using everyday children's toys. The assessment areas are observations of the child, and the equipment, instructions and criteria for achieving each area are listed on the form.

If the child passes the eligibility assessment, then they are ready to progress to the next step, the *Pre-Treatment assessment*.

If the child fails on one or more area of the non-verbal aspects of the eligibility assessment, then the child is unlikely to benefit from the BEST programme. Such children should be referred to other sources of support. SLTs may wish to discuss the child's needs with a senior or specialist colleague as part of a clinical reflection during routine supervision.

Pre-Treatment assessment

The pre-treatment assessment is an opportunity to evaluate the child's skills prior to commencing the BEST programme. This is an essential step, as it will allow the SLT to:

- Understand and document the child's current skills
- Discuss the child's needs with the parent(s)/carer
- Compare the child's skills at the end of the programme in order to evaluate the child's progress (or failure to respond to the programme)
- Write a care plan to share with:
  - The team delivering the BEST programme
  - Parent(s)/carer
  - Setting/School staff
  - The wider children's workforce, as appropriate

In addition to a full understanding of the nature of the impairment, SLTs should also consider completing a baseline clinical outcome measure in order to capture wider changes to the child's health: their activity and participation in daily activities; their personal experience of and response to their difficulties; and the environment around the child (see the International Classification of Functioning, Disability and Health (ICF) for further details (WHO, 2001)).

The pre-treatment assessment consists of the following elements:

Comprehension baseline assessment
This is likely to be a descriptive assessment of verbal comprehension, as children assessing the BEST programme are typically at a very early stage of language development.

Note: It is not necessary for a child to have achieved a particular level of comprehension prior to commencing the BEST programme.

Although the BEST programme does not target verbal comprehension skills, it is likely that the child's comprehension skills will develop along with their use of language. Constructivist theory suggests that the child does not need to fully understand an utterance in order to use it. In fact, using language and observing the effects on other people, is thought to help children to acquire a more detailed understanding of spoken language forms. This cyclical view of language development is in contrast to previous views of language acquisition where it was thought that children needed a stable understanding of a particular language structure prior to using it expressively.

BEST baseline assessment

This is a picture book assessment of the child's expressive language. The child is shown one picture at a time. The SLT says "Tell me what's happening here". The child's response (if any) is then noted.

It is not necessary to try and elicit full responses, nor to repair, remodel or in any way attempt to support the child to produce longer spoken sentences. This is a baseline assessment and will be compared with the later assessments to establish if the child has made progress. The aim of the baseline is to capture the child's *spontaneous* unsupported expressive language ability.

Scoring the BEST baseline assessment

The target spoken sentences are listed on the assessment form. Scoring is divided into two columns, Content and Morphology.

Content words are nouns and verbs.

Morphology includes:

- Determiners such as 'a' and 'the'
- Auxiliaries such as 'is'
- Inflections such as '-ing'

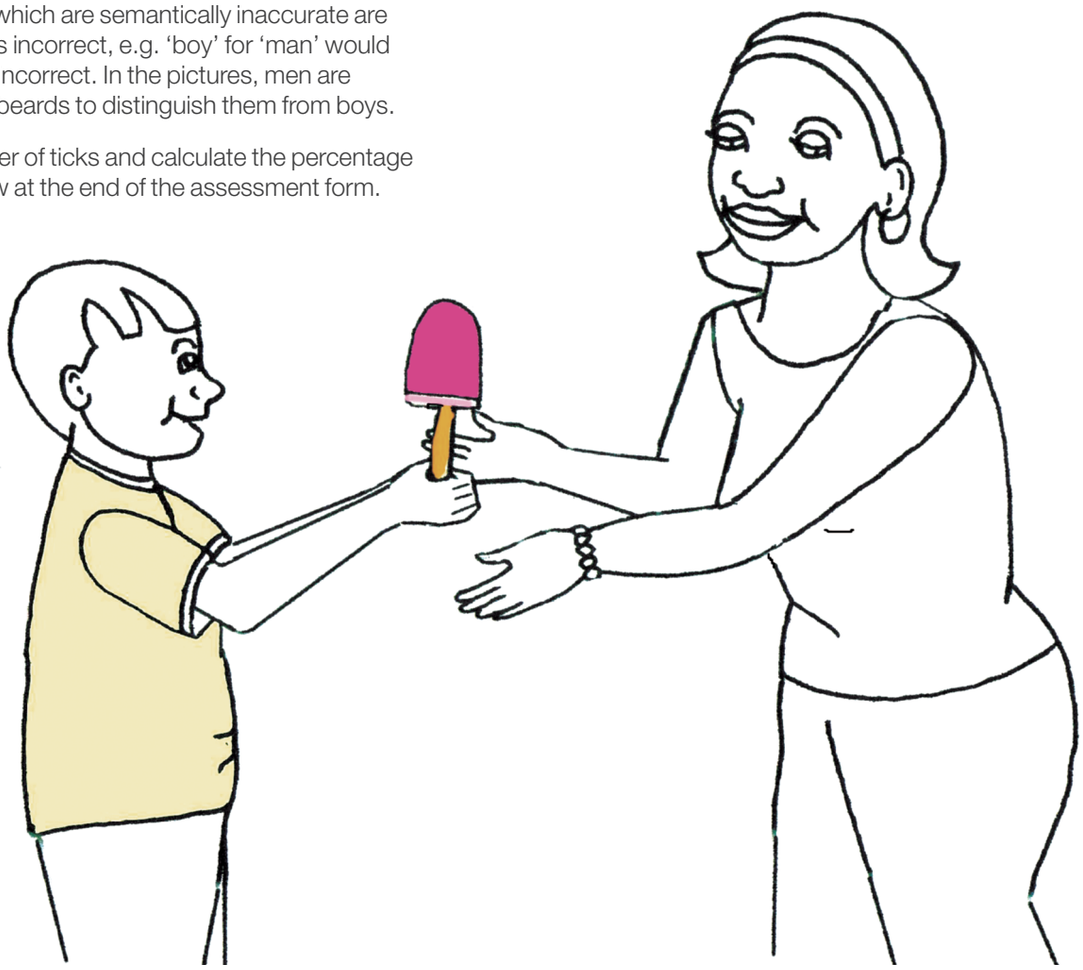
Tick if the element is included in the child's spoken response and put a cross where it is absent.

- Off-topic, irrelevant and other such spoken utterances are scored as incorrect.
- Local dialectal variations are scored as correct.
- Substitutions which are semantically inaccurate are also marked as incorrect, e.g. 'boy' for 'man' would be marked as incorrect. In the pictures, men are depicted with beards to distinguish them from boys.

Count the number of ticks and calculate the percentage correct in the row at the end of the assessment form.

Scoring protocol

- Acceptable determiners for the agent are: '**that**', '**the**', '**a**'.
- Acceptable determiners for patient are: '**the**', '**a**', '**his**'/'**her**'.
- Where a Noun argument is marked but the wrong lexical item is used, e.g. 'dog' for 'cat' this is scored as incorrect. This is also the case for 'mum'/'girl' and 'boy'/'man' confusions which are not allowed.
- Where a subject pronoun ('he' or 'she') is used for the agent this is accepted as correct.
- Where a child makes many attempts or produces separate clause elements as separate utterances, **only the first attempt/utterance is analysed**.
- Where a child makes a false start and self corrects part way through an utterance the complete corrected sentence is analysed,e.g. "the boy…. **the man is eating the apple**".
- The verb '**combing**' is accepted in place of '**brushing**'.
- The verb '**cuddling**' is accepted in place of '**hugging**'.
- The verb '**licking**' accepted for '**eating**' for items containing '**lolly**' only.



Care plan

A written care plan stating the child's individual aims should be written. BEST can address a number of specific aims for a child. A list of suggested aims is provided (see *BEST care plan treatment aims*). These are arranged into four main areas:

- **Syntactic targets:** These targets are for children who cannot combine words into spoken sentences.
- **Vocabulary targets:** These are for children who have not yet acquired a range of early nominal vocabulary. **Do not pre-teach the vocabulary** if the child is not familiar with the nouns which are part of the BEST programme. They will learn them as a part of this programme. In fact, the presence of a language frame around the word helps the child to abstract the word's meaning and function.
- **Action (verb) targets:** These targets are for children who have not yet acquired a range of verbs. Again **do not pre-teach the vocabulary** if the child is not familiar with the verbs which are part of the BEST programme. They will learn them as a part of this programme. In fact, the presence of a language frame around the word helps the child to abstract the word's meaning and function.
- **Phrase level targets:** These targets are for children who only use a single word or uninflected lexical item in a phrase.

Each child's care plan should be based on the results of the *BEST baseline assessment*. Do not use the same care plan for each child in the group. Some children will need to work on all of the above areas whereas others may need to work on only 2 or 3. BEST can address all of the above areas for the specific sentence and vocabulary items included in the intervention.

A suggested care plan template is included in the documentation.

Progress tracker chart

The *Progress tracker chart* is a convenient way of visually representing each child's progress through the BEST programme. Map the percentage correct scores for each of the following points along the BEST programme:

- Pre-Treatment assessment
- Decision point 1
- Decision point 2
- Outcome assessment
- Post-treatment review

Therapy sessions

Each therapy session consists of 'sets' of paired verbs. In the input phase (1), the children listen to between three and six spoken sentences while at the same time observing the toys acting out the same spoken sentence. The pairing of the action and the spoken sentence is crucial for the child to make a connection between the commentary and the observed event. The child also sees a visual representation of the spoken sentence in the form of a PGSS sentence.

The children are not required to say anything at this stage. If the children do comment, it is not necessary to record these spoken sentences.

In the output phase (2) the children are given an opportunity to provide a spoken sentence to match the toys' actions. Note that this is not a repetition of the previous verb. Record what each child says verbatim. Only record spontaneous spoken sentences (or words or phrases the child offers without prompting or support).

It is not necessary to support, scaffold, provide forced alternatives, semantic or phonemic prompts. The child will attempt a spoken sentence when they feel confident to do so.

It is not necessary to give verbal praise such as 'Well done!', 'Good try!' or other similar phrases. Providing a recast of the target utterance in the target form will be much more valuable and meaningful to the child. Participating in the activities and playing with the toys, and interacting with the adults and other children act as an intrinsic reward. We find that the children find the activity motivating and fun and that it holds their attention.

In a group situation, a child may hear several children producing the target spoken sentence (or attempts at the target sentence). As the BEST programme aims to develop the child's language skills by the end of the programme, it is not a cause for concern if the child is exposed to other children's spoken sentences. If the adult recasts each child's attempt, (as indicated in Table 3 describing the steps involved in a BEST session) all of the children will hear multiple examples of the target sentences.

Occasionally a child in the group may produce an unrelated or incorrect spoken sentence and the child you are recording may imitate that incorrect spoken sentence. In this case, re-direct the child's attention to the toys' action and ask again "What's happening?"

If a child produces no spoken sentence, model the sentence and record 'No response' on the recording form. Then move onto the next child. Do not attempt to elicit any spoken language from the child. If the child repeats the model, do not record this, as it will be a repetition and only spontaneous spoken sentences should be recorded.

The order of the sets of spoken sentences is listed on the *BEST Assessment and Therapy Record Booklet* next to the session number. Eight therapy sessions are completed prior to the first *Decision point*. Depending on the outcome of *BEST Assessment 1*, a further four therapy sessions are available. Depending on the outcome of *BEST Assessment 2* a final four therapy sessions are available.

This means that, depending on the rate of their progress, each child will complete either:

- Eight therapy sessions (the minimum number)
- Twelve therapy sessions
- Sixteen therapy sessions (the maximum number)

If a child misses a therapy session record this on the recording form. At the next routine group appointment the child who has missed a session should receive the same session as all the other children in the group. Do not attempt to provide the child's missing session out of sequence, alongside the other children.

You may wish to provide additional one-to-one sessions for the child when the BEST therapy sessions have been concluded for the other children, or as catch-up sessions during the course of the treatment. However, as stated previously, one-to-one therapy sessions are likely to be less effective than the group therapy sessions.

Attendance at as many sessions as possible will, of course, have the best outcome for the child. SLTs should discuss the importance of attendance with the child's parent(s)/carer and also encourage them to provide daily input for the child using the homework booklets provided.

Decision point 1

When the child has completed eight therapy sessions, administer *BEST assessment 1* to decide if they need to continue with the BEST intervention. There is a reminder to complete this assessment after session 8 on the *BEST Assessment and Therapy Recording Form.*

The assessment consists of eight pictures. Record and score the assessment in the same way as the *BEST baseline assessment*. Transfer the scores to the *Summary table* and the *Progress Tracker Chart* at the front of the *BEST Assessment and Therapy Recording Form*.

Discontinuing BEST due to a successful outcome at decision point 1

The BEST package has been effective if the child scores **85% or above on both content and morphology**. This score is marked on the Progress Tracker Chart and is equivalent to a score of **21** for content and **29** for morphology.

Advise the parent(s)/carer to continue looking at the homework booklet daily during the six week consolidation period. Then complete the *Post-treatment review*.

If the child has not achieved 85% or above on both content and morphology then continue with the next phase of the BEST intervention.

Decision point 2

When the child has completed a further four therapy sessions, administer *BEST Assessment 2* to decide if they need to continue with the BEST intervention. There is a reminder to complete this assessment after session 12 on the *BEST Assessment and Therapy Recording Form*.

The assessment consists of eight pictures. Record and score the assessment in the same way as the *BEST baseline assessment*. Transfer the scores to the *Summary table* and the *Progress Tracker Chart* at the front of the *BEST Assessment and Therapy Recording Form*.

Discontinuing BEST due to a successful outcome at decision point 2

The BEST package has been effective if the child scores **85% or above on both content and morphology**. This score is marked on the Progress Tracker Chart and is equivalent to a score of **21** for content and **29** for morphology.

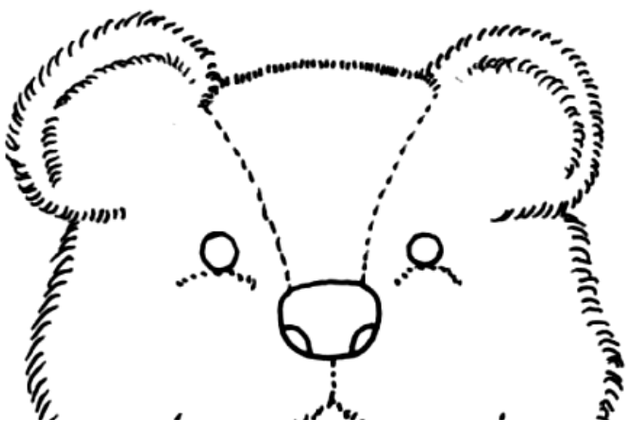
Advise the parent(s)/carer to continue looking at the homework booklet daily during the six week consolidation period. Then complete the *Post-treatment review*.

If the child has not achieved 85% or above on both content and morphology then continue with the next phase of the BEST intervention.

Outcome assessment

When the child has completed a further four therapy sessions, administer the *BEST outcome assessment*. There is a reminder after the last set of therapy session 16 to complete the assessment.

The assessment consists of sixteen pictures. Record and score the assessment in the same way as the *BEST baseline assessment*. Transfer the scores to the *Summary Table* and the *Progress Tracker Chart at the front of the BEST Assessment and Therapy Recording Form*.



Consolidation period

Children should be given a break from therapy of six weeks. During this period, parent(s)/carers should be encouraged to continue looking at the homework booklet with their child. Following this break, complete the *Post-treatment review*.

Post-treatment review

The assessment consists of sixteen pictures. Record and score the assessment in the same way as the *BEST Baseline Assessment*. Transfer the scores to the *Summary table* and the *Progress Tracker Chart* at the front of the *BEST Assessment and Therapy Recording Form*.

The *BEST Progress Tracker Chart* should now be complete. This chart can be used to support discussions with parents relating to the child's progress and how this might inform the next steps for that child and their family.

Further treatment

If children have developed sufficient language skills then no further treatment is indicated. It is important to consider if the child has any other speech, language or communication needs (such as phonological impairment or dysfluency) as co-morbidity is common in young children referred to speech and language therapy services (Broomfield and Dodd, 2004).

Children should only receive the BEST programme once. Do not repeat the programme with a child for whom the BEST package outcome has been poor. Children's 'response to intervention' is becoming widely recognised as an indicator of future likely progress. Children with a poor response to the BEST programme are likely to require a different approach and/or support from other sources.

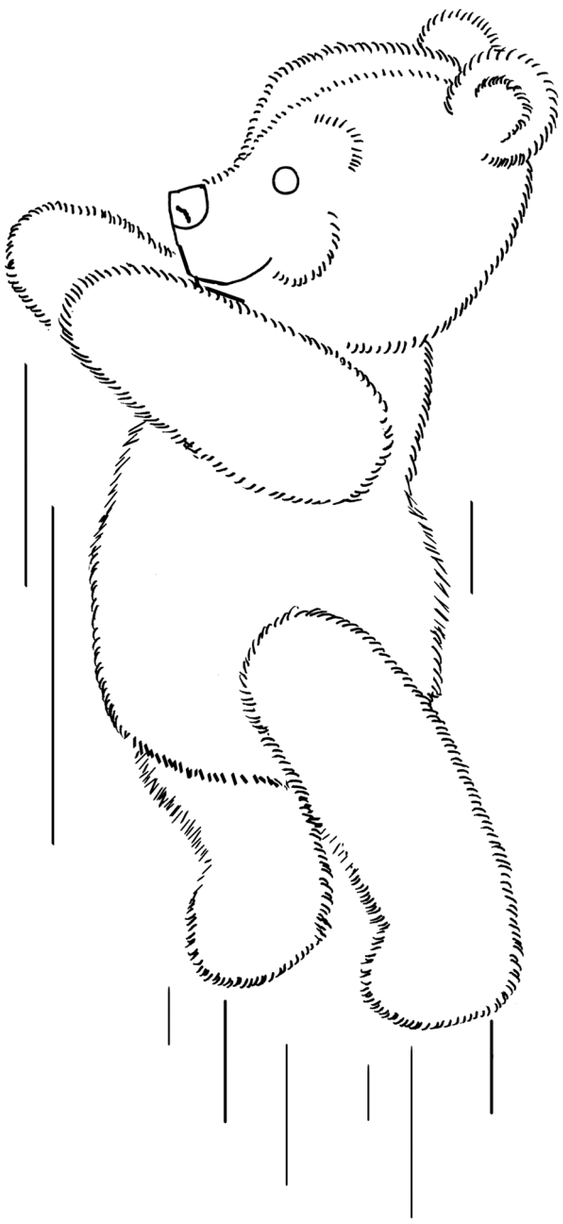
Children may have developed sufficient language skills to use simple spoken sentences but still have language difficulties when compared to their peers. Such difficulties may include problems with complex grammar and language concepts. These should be profiled and further appropriate interventions identified.

In our clinical experience, children who have completed the BEST programme and have a poor outcome should be referred for specialist and/or multi-professional assessment. Children with pervasive language difficulties are likely to have such difficulties in the context of a general developmental delay, learning difficulties or a specific difficulty learning language.

List of documentation and materials

The most up to date versions of all picture book assessments, assessment and recording forms and other additional guidance are available on the BEST web site.

1. **BEST** Manual
2. **BEST** Eligibility assessment
3. **BEST** Assessment Picture Booklet
   - BEST Pre-Treatment Assessment: BEST Baseline Assessment
   - Therapy Session Recording Forms
   - Decision Point 1: BEST Assessment 1
   - Decision Point 2: BEST Assessment 2
   - Outcome Assessment: BEST Outcome Assessment
   - Post-Treatment Review: BEST Review Assessment
4. **BEST** Assessment and Therapy Recording Form
   - Child's details
   - Timetable and attendance record
   - Summary Table
   - Progress Tracker Chart
   - BEST Pre-Treatment Assessment: BEST Baseline Assessment
   - Therapy Session Recording Forms
   - Decision Point 1: BEST Assessment 1
   - Decision Point 2: BEST Assessment 2
   - Outcome Assessment: BEST Outcome Assessment
   - Post-Treatment Review: BEST Review Assessment
5. **BEST** Care Plan Treatment Aims
6. **BEST** Care Plan
7. Paget Gorman Signed Speech Booklet for Therapy Sessions
8. Homework Booklets
9. Child's Star Chart
10. BEST Wall Chart



The theoretical basis of the **BEST** intervention: a usage based approach

In recent years, a new family of explanatory models of typical child language development has emerged, with a large and rapidly growing body of empirical work that supports its assertions. Despite this large body of evidence these 'usage based' or 'constructivist' theories have never been applied to the design interventions for children with language difficulties (Tomasello, 2006, Tomasello, 2003, Ambridge and Lieven, 2011).

'Usage based' or 'constructivist' theories suggest that the adult end state of language acquisition is not a set of grammatical rules per se, but rather an inventory of constructions which are linked to the pragmatic and semantic functions which they can communicate (Croft and Cruse, 2004). These constructions vary along a continuum of abstractness and hence flexibility with respect the lexical items which can be placed into them; ranging from the highly concrete and inflexible (e.g. '*How do you do?*') to the highly abstract, and flexible (e.g. NOUN1 + VERB + NOUN2 – meaning NOUN1 acts on NOUN2 and NOUN2 is affected), and with other constructions falling somewhere in between (e.g. X *wouldn't* Y *let alone* Z). Children's knowledge of these constructions is thought to be learned slowly and incrementally, and the progress of this learning determined both by the nature of the input and the child's cognitive abilities to construct abstract representations. Hence children build or 'construct' their knowledge of grammar over time and in response to their own and other's use of language for specific communicative purposes.

These 'usage-based' accounts contrast significantly from 'Generativist' approaches to language acquisition (Chomsky, 1959, Guasti, 2004) which have, until very recently, tended to dominate the debate with respect to linguistic explanations of the nature of Language Impairments (Clahsen, 2009, Wexler, 2003, van der Lely, 2003a) (c.f. Dabrowska, 2010). Generativist theories posit that all children are born with a universal grammar which consists of an innate knowledge of phrase structure, a set of principles (rules which are universal to all languages) and a set of parameters (a knowledge of which aspects differ between languages such that the correct setting for that parameter must be 'switched on') (Ambridge and Lieven, 2011). From this perspective the input given to the child is less important than in usage-based approaches, and grammatical impairments found in children with Language Impairments are thought to be linked to impaired innate knowledge of phrase structure and universal principles, such as 'movement' or 'checking' (Rice et al., 1995, Wexler, 2003, van der Lely and Battell, 2003, van der Lely, 2003b).

The BEST intervention aims to apply usage-based theory to improve the expressive language abilities of children aged between 3 and 6 years, with severe expressive or mixed expressive-receptive language difficulties (those who use a maximum of 2 clause elements in a sentence), aiming to enable them to use a range of 2, 3 and 4 element sentences, and to be flexible as to which lexical items are used in these constructions. In usage-based terms, the BEST intervention aims to support children with language difficulties to create abstract constructions for a range of simple sentences. In 2003, Tomasello described a usage-based, constructivist account of the process of language acquisition from words to an adult 'grammar' suggesting that this process is driven by two human characteristics: intention-reading (the ability to create shared understanding of communicative intentions within an interaction with a person) and pattern finding (the ability to identify regularities and patterns in complex inputs). In this account Tomasello describes **five stages** of language acquisition which are posited to proceed once multi-word utterances begin to be used, and describes the **cognitive mechanisms** brought to bear on the learning process which allow children to move from one stage to the next (Ambridge and Lieven, 2011, Tomasello, 2003, Tomasello, 2006).

1 **Frozen phrases:** These are rote learned, and therefore inflexible, utterances paired with a pragmatic function and a communicative context/cultural routine (e.g. "*I'm eating it*" bound to a meal time social routine). The cognitive mechanisms predominating at this stage are ***intention reading and cultural learning***.

2 **Lexically specific constructions:** These are partially productive/flexible utterances with a 'slot and frame' construction where only one element can vary (e.g. "*X fall down*" or "*I'm ACTIONing it*"). The key cognitive mechanisms at this stage are ***schematisation and categorisation***. That is, where children hear a sufficient number of sentences differing in only one element, they then form a ***schema*** consisting of which elements remain constant (the 'frame'), and which elements are variable (the 'slot(s)'). In addition they create categories with respect to the pragmatic and/or semantic function of both the 'frames' and of the items which are allowed in the 'slots'.

For example, 'frame' categories might be:

- "*X fall down*" – the category of events in which animate or inanimate objects unintentionally dropping to a lower place
- "*I'm ACTIONing it*" – the category of events in which the child is performing an action on an object.

'Slot' categories might be:

- *X fall down* – where X is the category of animate or inanimate objects which can fall
- *I'm ACTIONing it* – where ACTION is the category of the things I can do to objects
- *Eat X* – where X is the category of objects which can be eaten.

1 **Abstract constructions:** These are flexible, abstract constructions, created through the cognitive process of ***analogy***. Constructions with similarities in their function (e.g. *I'm ACTIONing it* and *PUSHER pushes PUSHEE*) are identified and, through analogy, semantic categories (e.g. AGENT, PATIENT) and constructions (e.g. AGENT + ACTION + PATIENT) are created. Similarities in form but not function may also be identified (e.g. ***The*** *boy like****s*** *football*; ***The*** *dog eat****s*** *meat*) and thence, again, through the process of analogy, syntactic categories and constructions such as SUBJECT + VERB + OBJECT constructed.

2 **Paradigmatic categories:** Categories of VERB and NOUN develop through the cognitive strategy of ***functionally based distribution analysis***. At this stage, categories are created, not by analogy with respect to function, but with respect to their collocation with other words, morphemes or structures (e.g. NOUN can be preceded by the, a, an, some and can take plural s marker).

3 **Reduction of over-generalisation:** Children learn to apply their abstracted constructions to only those utterances which are conventional for their language, therefore reducing errors. This stage is accomplished through the cognitive strategies of ***entrenchment*** and ***pre-emption***. ***Entrenchment*** occurs when a highly frequent item or construction becomes 'entrenched' or fixed in its use and its mapping to a function (e.g. "I eated it"). ***Pre-emption*** occurs when a child predicts which form they think will be used by an adult based on their knowledge of form-function mappings. When the child notices that the form used by the adult differs from that which is anticipated/pre-empted, they then gradually modify their production and representation of the construction, hence reducing errors resulting from entrenched forms and over-generalisations.

It is essential to note however that it is not *the child* who moves through these five stages, such that all of their language knowledge 'as a piece' moves from one stage to the next. Rather separate language constructions take this journey towards a highly abstract end state, progressing at different speeds for different constructions, and with differing endpoints in the journey, with some constructions staying as a frozen phrase (e.g. '*How do you do?*'), some progressing to the level of paradigmatic categories (e.g. NOUN1 + VERB + NOUN2 – meaning NOUN1 acts on NOUN2 and NOUN2 is affected), and some ending their journey at the level of a 'frame' and 'slot' construction (e.g. X *wouldn't* Y *let alone* Z). How far and how quickly the journey is taken towards abstractness for each construction is thought to depend on the nature of the language input heard by the child, both in terms of quantity and distribution (e.g. how many different forms of NOUN1 + VERB + NOUN2 combinations the child hears); the nature of this input providing the 'raw data' to which the child can apply the cognitive mechanisms of intention reading, cultural learning, schematisation, categorisation and analogy, functionally based distribution analysis, entrenchment and pre-emption, in order to 'construct a grammar'.

Applying usage-based theory to intervention

The BEST intervention approach is designed to support children with language difficulties to harness the cognitive mechanisms of ***intention reading***, ***cultural learning***, ***schematisation***, ***categorisation*** and ***analogy*** in order to move through Stages 1-3 described above (**Frozen phrases, Lexically specific constructions; Abstract constructions**) for a range of simple sentences; the underlying principle of the approach being that that the nature and quantity of the input a child hears is central to the process of acquisition.

Moving to abstract rather than frozen or lexically specific constructions allows the child to become flexible and productive in their expressive language. Hence the child can vary the structures and the vocabulary used, and so greatly increases the range of communicative functions they can express. Furthermore, the development of abstract constructions is also thought to support the child to learn other, related structures more readily, hence increasing the child's rate of language development for novel, related constructions (Langacker, 2000).

BEST also manipulates the input to support the general learning mechanisms of ***mapping*** (i.e. laying down a representation of a new construction together with a link to its function) and ***retention*** (i.e. successfully creating a representation which remains in the long term memory): achievements which are often trivial for typically developing children but which are extremely challenging to children with Language Impairment or Language Delay (Gray, 2004, Gray, 2003, Riches et al., 2005, Fey et al., 2003).

The following describes the design of the BEST intervention approach, and then goes on to describe how the BEST approach supports children to harness the cognitive mechanisms of intention reading, cultural learning, schematisation, categorisation, analogy, mapping and retention for language learning.

The design of BEST

The BEST intervention targets simple, declarative sentences of SV, SVO, SVOO and SVOA structures. For each structure a number of early developing verbs were identified (Morrison et al., 2003) (Table 4).

Number of Arguments	Set	Argument Structure	Input	Output
1	A	Agent^{2} + Action^{1}	*laughing*	**sitting**
1	B	Agent^{2} + Action^{1}	*jumping*	**walking**
2	C	Agent^{1} + Action^{1} + Patient^{2}	*eating*	**washing**
2	D	Agent^{1} + Action^{1} + Patient^{2}	*riding*	**smelling**
2	E	Agent^{1} + Action^{1} + Patient$^{2(M)}$	*kissing*	**hugging**
2	F	Agent^{1} + Action^{1} + Patient^{2}	*kicking*	**brushing**
3	G	Agent^{1} + Action + Patient^{2} + Locative^{1}	*putting*	**putting**
3	H	Agent^{1} + Action + Patient^{1} + Locative^{2}	*pouring*	**pouring**
3	I	Agent^{1} + Action^{1} + Patient$^{2(I)}$ + Locative$^{2(O)}$	*putting*	**pouring**
3	J	Agent^{1} + Action + Patient^{2} + Benefactive^{1}	*giving*	**giving**
3	K	Agent^{1} + Action + Patient^{1} + Benefactive^{2}	*throwing*	**throwing**
3	L	Agent^{1} + Action^{1} + Patient$^{2(I)}$ + Benefactive$^{2(O)}$	*giving*	**throwing**

^{1}Contrast between Input & Output; ^{2}Variation within Input and Output; $^{2(M)}$ Variation within Input only; $^{2(E)}$ Variation within Input only

Table 4. Verbs and Predicate argument structures targeted by the BEST programme and the use of Contrast and Variation in those structures.

These verbs were grouped into pairs, which had the same predicate argument structure (PAS) (Whitworth, 1995) and which could, where possible, be combined with the same nouns to make semantically plausible sentences (this latter criteria was not always possible to fulfil but was adhered to as often as possible).

For verb pairs with one or two argument PAS, the children are taken through a two step process of therapy as follows:

1 **Input (with variation):** The child hears Verb 1 (e.g. eat) of the target structure (e.g. Agent + Action + Patient) used between 3 and 6 times with a 'frame' held constant and one 'slot' *varied* (e.g. The man is eating an **apple**, the man is eating an **orange** the man is eating a **banana**). Whilst hearing the input the child sees the actions being completed by the adult with miniature toys. For verbs with one argument the varying item is the agent, and for verbs with two arguments the varying item is the patient. Paget Gorman Signs are used alongside the verbal input. Paget Gorman Signed Speech (PGSS) is a signing system designed to be used with children with Language Impairments which is designed to represent spoken English in the visual domain. It marks both content words and grammatical morphology, follows spoken English word order and is used alongside speech (Paget Gorman Society).

2 **Output (with variation and contrast):** The child then sees the adult act out an event with the same PAS but with a *contrasting* verb, Verb 2 of the verb pair, and the child is encouraged to describe what they see. This is repeated a number of times, again with a 'frame' held constant and one 'slot' *varied* (e.g. The teddy is washing an **apple**, the teddy is washing an **orange**, the teddy is eating a **banana**). Whatever the child's response, whether they are fully or partially successful (or indeed wholly unsuccessful) in their attempt to describe the event, they are allowed to act out the event with the toys while the adult provides a input of the target utterance (again using PGSS). For PAS containing 2 or more arguments, additional contrast between the Input (Verb 1) and the Output (Verb 2) is created by also contrasting the agents between the two conditions.

In order to support the child to begin to make *links* between the two constructions and so facilitate the cognitive process of analogy, the final example in the Input phase (Verb 1) switches to the Agent which will be used in the Output Phase (Verb 2) (see Table 2 for examples).

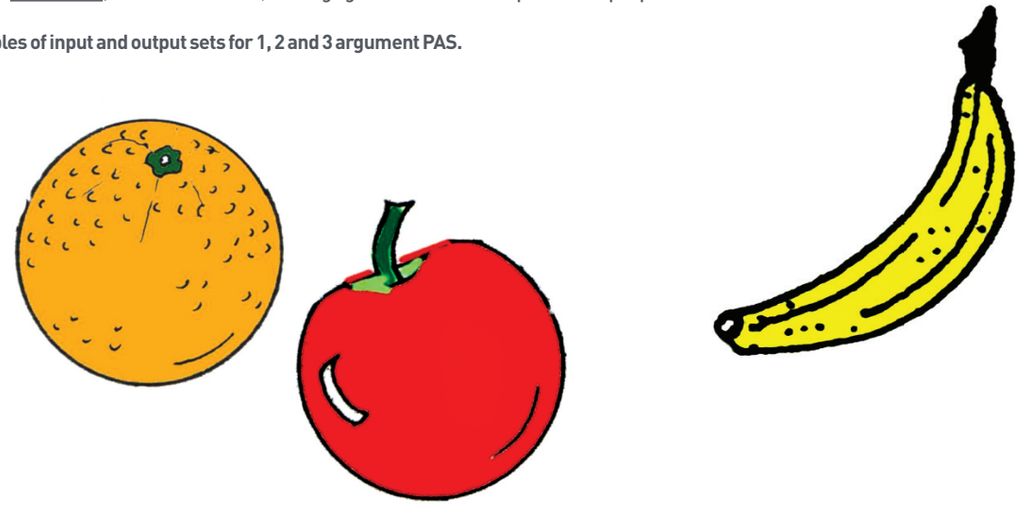
For verb pairs with three argument PAS, the children are taken through the Input – Output steps described above three times; the first cycle contrasting the agent and the locative/benefactive and varying the patient; the second contrasting the agent and the patient and varying the locative/benefactive; and the third contrasting the verb and the agent, varying the patient in the Input step and varying the locative/benefactive in the Output step. Table 5 below provides fully elaborated examples of each type of Input – Output cycle or 'set'.

Children receive therapy for 16 sessions of between 30 and 45 minutes duration. During each session the children complete approximately 3 sets of Input – Output 'sets' (e.g. set C, D and E). Over the course of the 16 sessions, children move through the 12 sets (A – L) of the Input – Output conditions, and parents receive a homework book which includes pictures for each of the target sentences that occur in the BEST programme (i.e. in both the Input and the Output conditions). For this homework ('Listen to learn BEST') the focus is on input, with parents encouraged to describe the pictures and so provide repeated input of the target sentences. The child is not expected to repeat or imitate these sentences but is praised and rewarded if they do so spontaneously. These 16 sessions can be delivered weekly or twice weekly and include regular reviews of progress.

Number of Arguments	PAS	Input	Output
1	SET A:	1 The baby is laughing	1 The man is **sitting**
	Agent +	2 The woman is laughing	2 The woman is **sitting**
	Action	3 The boy is laughing	3 The boy is **sitting**
		4 The girl is laughing	4 The girl is **sitting**
		5 The teddy is laughing	5 The teddy is **sitting**
		6 The man* is laughing	6 The baby is **sitting**
2	SET C:	1 The man is eating an apple	1 The **teddy** is **washing** an apple
	Agent +	2 The man is eating an orange	2 The **teddy** is **washing** an orange
	Action +	3 The man is eating a banana	3 The **teddy** is **washing** a banana
	Patient	4 The man is eating a carrot	4 The **teddy** is **washing** a carrot
		5 The man is eating a lolly	5 The **teddy** is **washing** a spoon
		6 The teddy* is eating a banana	6 The **teddy** is **washing** a cup
	SET G:	1 The baby is putting a spoon on the table	1 The **man** is putting a spoon on the **bed**
	Agent +	2 The baby is putting a cup on the table	2 The **man** is putting a cup on the **bed**
	Action +	3 The baby is putting a flower on the table	3 The **man** is putting a flower on the **bed**
	Patient +	4 The baby is putting a key on the table	4 The **man** is putting a key on the **bed**
	Locative	5 The man* is putting a phone on the table	5 The **man** is putting a phone on the **bed**
3	SET H:	1 The man is pouring milk into a cup	1 The **baby** is pouring **juice** into a cup
	Agent +	2 The man is pouring milk into a shoe	2 The **baby** is pouring **juice** into a shoe
	Action +	3 The baby* is pouring milk into a box	3 The **baby** is pouring **juice** into a box
	Patient +		
	Locative		
	SET I:	1 The man is putting a spoon on the bed	1 The **baby** is **pouring** juice in the shoe
	Agent +	2 The man is putting a cup on the bed	2 The **baby** is **pouring** juice in the box
	Action +	3 The man is putting a flower on the bed	3 The **baby** is **pouring** juice in the cup
	Patient +	4 The man is putting a key on the bed	
	Locative	5 The Baby* is putting a phone on the bed	

Key: Variation is underlined; Contrast is in **bold**; Linking agents between the input and output phases are marked with a*

Table 5. Examples of input and output sets for 1, 2 and 3 argument PAS.



How does **BEST** harness the cognitive mechanisms advanced by usage-based theory?

The BEST intervention approach is designed to support children with language difficulties to harness the cognitive mechanisms of ***intention reading***, ***cultural learning***, ***schematisation***, ***categorisation***, ***analogy, mapping*** and ***retention***. In this way, BEST aims to support the child to learn the targeted constructions and to move their representations of these constructions through Stages 1-3 of the language acquisition process previously described: **Frozen phrases; Lexically specific constructions; Abstract constructions** (Ambridge and Lieven, 2011, Tomasello, 2003); the underlying principle of the approach being that that the nature and quantity of the input a child hears is central to the process of acquisition. The following will define and describe these cognitive mechanisms and describe how BEST aims to support children to apply them to their learning.

1. Intention reading and cultural learning

At the earliest stages of multi-word speech the child learns an inventory of frozen phrases, storing both the phrase and the communicative function of that phrase. In order to create this form-function mapping the child must 'read' the communicative intentions of the person from whom they are learning the phrase. This learning happens through the child's ability to '***intention read***' within the scaffolding of joint attentional frames.

Joint attentional frames are the objects and actions which partners within a communicative interaction know are the attentional focus of both parties in the interaction (Bruner, 1983, Tomasello, 1999). In order for the focus to be on the same shared objects and actions children and adults within the interaction require an understanding of the global purpose of that interaction. For example, in a room containing exactly the same objects and people the joint attentional frame could shift from a 'playing with toys' frame to a 'getting ready to go outside' frame, dependant on the shared understanding of the global purpose of the interaction. This shared global understanding then supports the child to ***intention read*** the communicative intentions of an adult when they use a novel utterance, and so to successfully create a stored representation of the novel utterance which is linked to the inferred communicative intention.

For example if the adult says '*put your shoes on*' whilst picking up the child's shoes, if the child understands the global frame of 'getting ready to go outside' they are then likely to correctly '***intention read***' the communicative function of the utterance, recognising it to be an imperative utterance and linked to the object of the shared attention (the shoes).

However, if they have construed the attentional frame to be 'playing with toys' they may misinterpret the adult's intentions as being a referential utterance, simply drawing the child's attention to the object in question. For children to create an accurate understanding of the communicative functions of utterances they must therefore understand the knowledge and intentions of their conversational partners at two levels: at the level of the attentional frame (which objects and actions are we both attending to and what is the global purpose of this joint attention); and at the level of the individual communicative acts within that frame (which objects and actions is the adult referring to with a specific utterance).

Cultural learning is a form of imitative learning from which truly symbolic representations emerge. Simple imitative learning with objects or physical movements requires the child to simply mirror the actions of the adult. Imitation of a communicative behaviour, however, requires the child to mirror the adult and also to understand that the roles within the triad of the interaction (adult - child - object/action) have reversed. Hence the child comes to understand that, when they use the same utterance as the adult, the communicative intention which was conveyed to the child when they were the listener, is conveyed to the adult when the child is the speaker. This understanding that the adult can understand and produce the symbol, and the child can understand and produce the symbol and that there is a shared understanding of that symbol, is termed cultural learning (Tomasello, 2003).

How does BEST promote intention reading and cultural learning?

- The structured and repetitive approach of BEST, within which a predictable 'joint action routine' is established (Bodrova and Leong, 2006), creates a joint attentional frame between the child and the adult, which 'scaffolds' the child's ability to infer the communicative intention of the utterances they hear (i.e. describing an event within a play activity). Hence the child quickly becomes able to infer the communicative intentions of the adult at the level of the attentional frame (which objects and actions are we both attending to and what is the global purpose of this joint attention); and so is supported to make such inferences at the level of the individual communicative acts within that frame (which objects and actions is the adult referring to with a specific utterance) (Tomasello, 2003, Ambridge and Lieven, 2011).
- The element of role reversal within the 'joint action routine' which is established in BEST promotes cultural learning and hence the creation of symbolic linguistic representations (Tomasello, 2003, Ambridge and Lieven, 2011).

2. Schematisation and categorisation

Schematisation is a domain general cognitive strategy which children use to find patterns and rules within the world and to combine actions into multi-step procedures towards an end goal (Piaget, 1952). In language development, usage-based theorists propose that, if children hear sufficient repetitions of the same utterance but with one constituent of that utterance varied (e.g. "*X fall down*" or "*I'm ACTIONing it*"), then they will create a rule or schema identifying which aspects of the utterance recur or remain stable across utterances (the 'frame') and which vary across utterances (the 'slot' into which various items can be placed). This schematisation process therefore results in the development of lexically specific constructions: partially flexible utterances with a 'slot and frame' construction (Lieven et al., 1997, Gomez, 2002, Mandler, 2000, Tomasello and Brooks, 1998).

In order to use these 'slot and frame' constructions appropriately children must also apply the cognitive process of ***categorisation***. That is they must form categories of which items can go into a 'slot'. Such categories are still relatively concrete, functionally based categories and so the category X in "*X fall down*" would consist of 'animate or inanimate objects which can involuntarily move from a high place to a low place', and the category ACTION in "*I'm ACTIONing it*" would consist of 'actions I can perform'.

Both ***schematisation and categorisation*** are thought to depend on the nature of the language input heard by the child, both in terms of quantity and distribution (i.e. a critical mass of types and tokens must be heard for children to schematize and categorise frames and items which can be inserted into slots respectively) (Lieven et al., 1997, Gomez, 2002, Mandler, 2000, Tomasello and Brooks, 1998).

How does BEST promote schematisation and categorisation?

- BEST provides the kind of language input thought to be necessary for 'slot and frame' constructions to emerge: namely multiple exemplars of highly similar sentences where one element is systematically varied (Lieven et al., 1997, Gomez, 2002, Mandler, 2000, Tomasello and Brooks, 1998).

3. Analogy

Analogy is another cognitive strategy by which individuals find patterns and commonalities between phenomena but in this case the patterns do not relate to the individual items which make up the phenomenon (e.g. the lexical items in the lexically specific schema) but rather the functional relationships between the items. For example '*The X is Ying the Z*' is analogous to '*A is Bing the C*' because the same functional relationships are being referred to in each case (Gentner and Markman, 1995, Gentner and Markman, 1997, Gentner and Medina, 1998). That is, A and X are doing something, Y and B are actions, and Z and C are having something done to them. As Tomasello explains, "when an analogy is made the objects involved are effaced; the only identity they retain is their relational structure" (p.164 Tomasello, 2003).

Through aligning constructions according to functional and structural similarity it is thought that children can abstract semantic categories such as AGENT, ACTION, PATIENT and semantic constructions such as AGENT + ACTION + PATIENT; AGENT + ACTION + PATIENT + LOCATIVE.

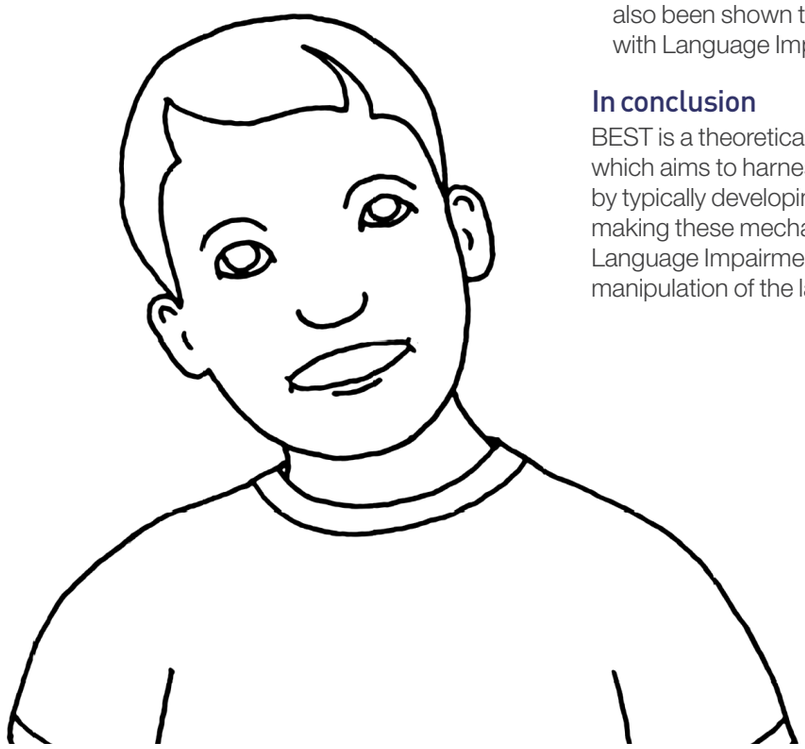
Gentner and Medina (1998) suggest that the cognitive process of analogy is facilitated where some elements of consistency in the aligned constructions are maintained. For example the creation of analogies is easier if items only occur in one type of 'slot' and not others (so, for example if PATIENTS and AGENTS in analogous structures are non-overlapping sets).

An additional cue which is thought to support the process of analogy is similarities in the grammatical morphology of the aligned constructions (i.e. **The** X is Y**ing the** Z), providing a structural cue as to the similarity between the constructions (Ambridge and Lieven, 2011, Childers and Tomasello, 2001).

Finally, children have been shown to learn constructions best where exposure to the novel item is spread over a number of days, hence distributed rather than massed learning appears to facilitate greater progress (Ambridge et al., 2006).

How does BEST promote analogy?

- The Input and Output steps of BEST provide exposure to paired constructions with analogous predicate argument structures but which contrast in the verbs used; this alignment of multiple exposures to analogous constructions providing children with multiple opportunities to identify the similarities in functional relationships across the contrasted constructions (Gentner and Markman, 1995, Gentner and Markman, 1997, Gentner and Medina, 1998).
- For each Input and Output pairing the items in each argument structure role are non-overlapping sets, providing a level of consistency thought to facilitate analogy (Gentner and Medina, 1998).
- For each Input and Output pairing the morphological 'frame' remains constant across the contrasting constructions (Ambridge and Lieven, 2011, Childers and Tomasello, 2001). Furthermore, as children with Language Impairments often have significant difficulty with grammatical morphology, particularly bound morphemes (Leonard, 2003, Leonard, 2007, Rice et al., 2004), the children's ability to use this cue to facilitate learning is supported by the use of PGSS which provides a gestural representation of the grammatical morphemes alongside speech.
- BEST does not proceed in levels, nor does it demand that children pass particular levels of competence with constructions before moving on to targeting new structures. Rather over the course of the 16 sessions children move through the 12 sets (A – L) of the Input – Output pairings, rotating through the different constructions over the course of the therapy. This therefore results in distributed exposures to constructions and exposure to a range of constructions across which the child can look for and find analogies (Ambridge et al., 2006, Riches et al., 2005).



4. Mapping

In order to learn a construction, be it a word, a phrase or a complex sentence, the child must create a representation of that construction in their memory which is linked to the meaning and/or pragmatic function of that construction. In typical development, children 'fast map' such representations after only a few presentations in a meaningful interaction, and subsequently elaborate the detail and the richness of these representations over subsequent presentations (Hirsh-Pasek et al., 2000).

How does BEST promote mapping?

- BEST provides multiple repetitions of the same and similar constructions in contexts which support mapping to the pragmatic function and semantics of the utterance, both in therapy and through homework activities. Children with Language Impairment or Language Delay typically require many more repetitions of constructions than typically developing children if they are to map them (Gray, 2004, Gray, 2003, Riches et al., 2005, Fey et al., 2003).

5. Retention

In order to apply novel constructions children must retain them in their long term memory. In Typical Development *distributed exposure* has been shown to support long term retention in linguistic and other domains (Ambridge et al., 2006, Janiszewski et al., 2003).

How does BEST promote retention?

- BEST manipulates the input both within therapy sessions and in homework to ensure that children hear the target items on occasions which are spread across a number of days, (in this case spread over 16 therapy sessions). This distributed learning is helpful to typically developing children but has also been shown to be advantageous to children with Language Impairment (Riches et al., 2005).

In conclusion

BEST is a theoretically motivated language intervention which aims to harness the cognitive mechanisms used by typically developing children to build early sentences; making these mechanisms available to children with Language Impairment or Language Delay through the manipulation of the language Input in their environment.

Appendix: Care Aims for children with language delay and disorder

Syntactic targets

These targets are for children who cannot combine words into spoken utterances.

To produce a range of spoken utterances including an **AGENT** and **ACTION (SV)**, e.g. "The **baby** is **walk**ing".

To produce a range of spoken utterances including an **AGENT**, **ACTION** and **PATIENT (SVO)**, e.g. "The **girl** is **kick**ing a **cup**".

To produce a range of spoken utterances including an **AGENT**, **ACTION**, **PATIENT and BENEFACTIVE (SVOO)**, e.g. "The **girl** is **throwing** a **ball** to the **lady**".

To produce a range of spoken utterances including an **AGENT**, **ACTION**, **PATIENT** and **LOCATIVE (SVOA)**, e.g. "The **girl** is **putting** a **cup** on the **table**".

Vocabulary targets

These are for children who have not yet acquired a range of nominal vocabulary.

To use a range of (6) **AGENTS/BENEFACTIVES**, "Man", "Woman/Lady", "Girl", "Boy", "Baby", "Teddy (Bear)".

To use a range of (24) **PATIENTS/LOCATIVES**, including: "Apple", "Orange", "Banana", "Carrot", "Lolly(pop)", "Spoon", "Cup", "Cat", "Horse", "Bike", "Flower", "Sock", "Carrot", "Ball", "Train", "Shoe", "Brush", "Key", "Phone", "Table", "Bed", "Milk", "Box", "Juice".

Grammatical targets

Action (verb) targets

These targets are for children who have not yet acquired a range of verbs.

To produce (two) **intransitive verbs** (SV - AGENT + ACTION), "sitting", "walking".

To produce a range of (four) **transitive verbs** (SVO - AGENT + ACTION + PATIENT) "washing", "smelling", "hugging", "brushing".

To produce (two) **di-transitive verbs** (SVOA - AGENT + ACTION + PATIENT1 + LOCATIVE2) "putting" and "pouring".

To produce (two) **di-transitive verbs** (SVOO - AGENT + ACTION + PATIENT1 + BENEFACTIVE2) "giving" and "throwing".

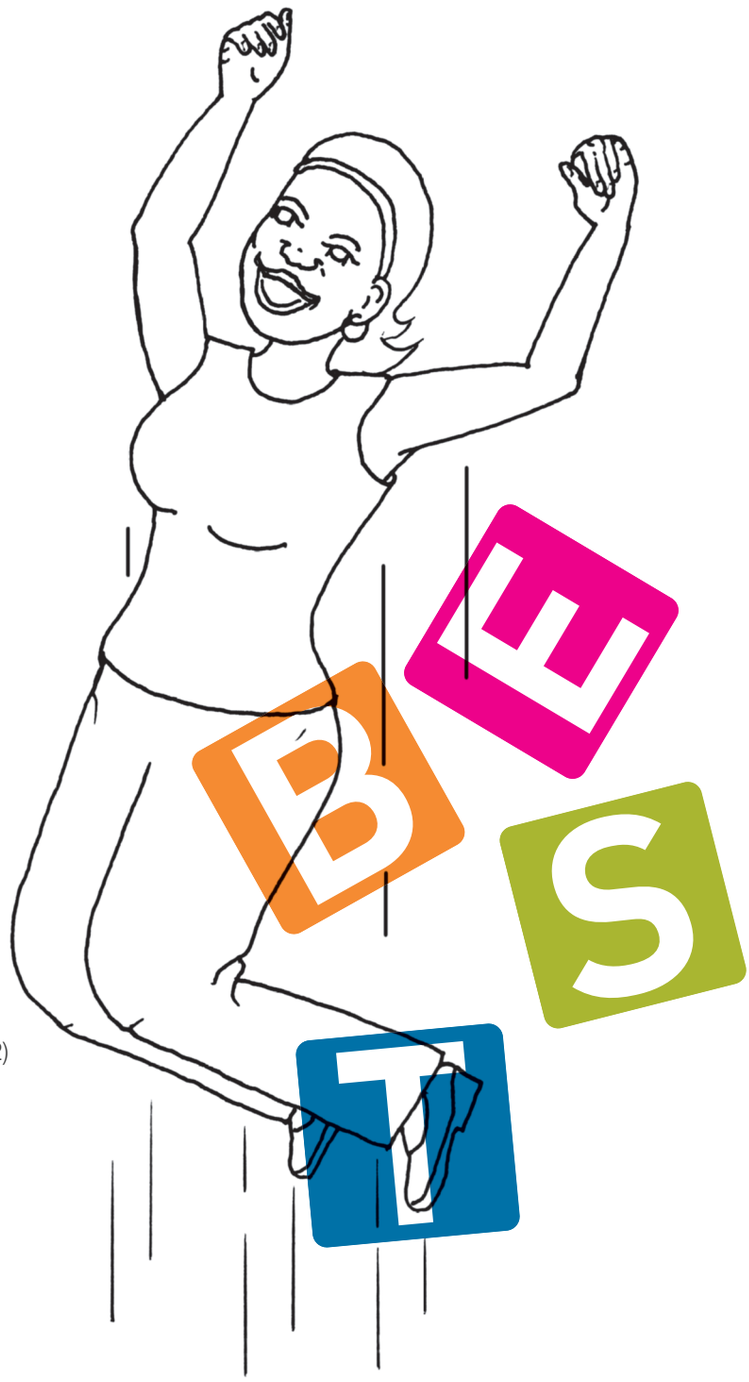
Phrase level targets – noun phrases and verb phrases

These targets are for children who only use a single word or uninflected lexical item in a phrase.

To use a **determiner** with a noun, e.g. "**The** girl", "**a** spoon"

- Definite article '*the*'
- Indefinite article '*a*' / '*an*'

To use an **auxiliary verb** '*is*', e.g. "The man **is** eating an apple"



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