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Abstract

Dynamic assessments (DA) of language have been shown to be a useful addition to the battery of tests used to diagnose language impairments (LI) in children, and to evaluate their skills. The current paper explores the value of the information gained from a DA in planning intervention for LI. A single case study was used to demonstrate the detailed qualitative information that can be derived from a DA procedure, and how that information may be used to elicit greater gains from intervention. The participant was a boy, aged 9, with a previously diagnosed language impairment. He was receiving language therapy regularly in a language resource base attached to his school. The CELF-3 (UK) was used to monitor changes in his language, before and after two periods of intervention. The initial baseline phase consisted of regular ongoing language therapy. The second phase of therapy was modified by the SLT after receiving a report of the child's performance on the Dynamic Assessment of Sentence Structure (DASS Hasson et al 2012), and observations of the child's metalinguistic and metacognitive awareness. Greater gains observed in the second phase of therapy, reflected the good modifiability shown by the child's performance on the DASS.

Keywords

Dynamic assessment, language impairment, language therapy

Introduction

Assessment for clinical management and the planning of intervention is a different process to assessment for diagnostic purposes (Lloyd and Blandford 1991), and one for which standardised tests are not specifically designed. None of the standardised language tests or measures commonly used in practice by Speech and Language Therapists (SLTs) are sufficient on their own to fully diagnose and comprehensively describe a child's language impairment. Most are not intended to formulate recommendations for intervention beyond the identification of structures that the individual has failed to master. Alternatives to traditional assessments, such as dynamic assessment (DA) have been found to have greater predictive validity than standardised tests (Campione and Brown 1987, Grigorenko and Sternberg 1998, Hessels 2009, Camilleri and Botting 2013). DA provides comprehensive information about an individual's language performance that could be used to plan intervention. Alternative assessments and combinations of standardised tests with additional sources of information have been advocated in the fields of psychometrics, education and SLT (e.g., Mislevy and Lin, 2009; Gillam and McFadden, 1994; Meltzer and Reid, 1994; Lloyd and Blandford, 1991; and Laing and Kamhi, 2003). Links to intervention outcome, however, have not been established.

The selection of targets for remediation, strategies for facilitating achievement, and prognoses for improvement are vital components of intervention planning. Yet in a survey of SLTs' intervention practices for children with receptive language impairments, Law et al (2008) found that SLTs did not support their intervention

plans by providing theoretical rationales, and the links between their assessment data and intervention strategy were not evident, with assessments failing to differentiate the individual needs of children. Furthermore, obtaining evidence for the effectiveness of interventions is an ongoing challenge for Speech and Language Therapists, with outcomes difficult to achieve in the face of heterogeneous populations of clients. Vance and Clegg (2012), propose that 'case study research that includes some element of experimental control can and does contribute to the evidence base for speech, language and communication interventions' (P255). It is the contention of the present paper that the individual case study also provides the opportunity to link the outcomes of intervention to the specific findings of detailed assessment.

A Dynamic Assessment is one in which the assessor actively intervenes in order to elicit an improved performance from the testee, that is a measure of his potential for learning (Haywood and Lidz 2007). In contrast to a static assessment, that measures the crystallized *product* of learning, the focus in DA is on the *process* of learning, and the responsiveness of the individual to instruction and learning (Haywood and Lidz 2007). An increasing number of research studies in SLT are exploring the uses of DA in differential diagnosis, and prognosis for improvement through intervention.

The criterion validity of several dynamic tests of language (and of other content areas) has been established by significant correlation between the scores obtained

on the measure, and those obtained on the standardised tests. The correlations, however, are weak, as anticipated by the assumption that only part of the achievement on the DA measure is related to achievements in content, as also measured by the standardised tests. This would be consistent with the interpretation of Embretson (1987b), who asserted that validity of a DA may be demonstrated by only partial correlation with criterion tests, as the achievement criteria are frequently not the targets of the DA. The remaining variance is influenced by the learning potential measures, such as the number of cues required for the child to produce the targeted response. Hessels, Berger and Bosson (2008) demonstrated low-moderate correlation (.45) between the Hessels Analogical Reasoning Test (HART) and a static test, the Ravens SPM with which only some of the same dimensions are assessed. Likewise Camilleri and colleagues (Camilleri and Law 2007; Camilleri and Botting, 2013) reported statistically significant but moderate correlations between their dynamic measures of word learning and the static BPVS.

Peña and Gillam (2000), described how DA helped to determine the therapeutic needs of three children with SLI. In each case, Peña and Gillam carried out static pre and post tests, and a mediational intervention stage, as described by Lidz (1991). Dynamic assessments afford therapists the opportunity to elicit information about a client's metalinguistic knowledge and metacognitive awareness, and the use of mediated intervention in language tasks is compatible with a metacognitive and/or metalinguistic approach to intervention.

A two part study that followed the results of a dynamic assessment with an intervention programme was carried out by Olswang, Bain and Johnson (1992). They applied Vygotskian theory and Feuerstein's DA methods to measure the learning potential of young children's language acquisition. The authors constructed a hierarchy of prompts and transfer tasks to assess the potential for two children at the single word stage of development to progress to combining two words in various semantic relationships. Although the children performed similarly on the static assessment, their response to prompting during the DA differed markedly.

The children subsequently received three weeks of intensive (one hour sessions, three times a week) direct treatment designed to teach the two-word utterances. As predicted from the DA, the rate of change of the two participants differed, although both showed some gains in production of targeted semantic structures. Tentative conclusions provide support for the value of the DA procedure to determine a child's potential to benefit from intervention. Indeed, one subject showed the propensity for imminent change that may have occurred spontaneously without intervention while the other showed little ability to benefit from instruction at the time it was given. The authors postulated the existence of a third profile between those two, that of a child showing gains, but only with substantial instruction.

Hasson (2011) similarly attempted to increase understanding of the association between assessment findings and chosen therapy approach. The assessment devised was designed to capture, in greater detail, the learning skills and intervention needs of individual children with language impairments. The assessment paradigm adopted, following the work of Peña and Gillam, focused on the dynamic assessment of a specific area of language. *The Dynamic Assessment of Sentence Structure (DASS)*, for children with language impairments, was described by Hasson, Dodd and Botting (2012). The test consisted of a sentence anagram task, in which children were required to formulate two different sentences from a given set of words. The items in the test were grammatically controlled in terms of developmental difficulty as well as sentence length, and tapped into structures reported to be problematic for children with language impairments. Children were systematically assisted by a series of graded prompts that were individually mediated to the children. After each item, children were invited to reflect on the requirements of the task, and whether any aspects of the task were causing difficulties for them. This enabled assessment of their metalinguistic expression and of their metacognitive awareness. Hasson et al demonstrated that correlations between the DASS and the CELF-3 were significant ($r_s = -.481, p = .017$). In addition, the DASS reliably differentiated between children in the group, all of whom were diagnosed as 'language impaired' and had scored uniformly poorly on the standardised language test (CELF-3(UK) (Semel, Wiig and Secord, 1987).

The DASS procedure was piloted on a group of twenty-four 8-10 year old children who were attending language resourced schools and receiving regular SLT intervention. Individualised information from the DASS was made available to the SLTs working with the children, by means of summary reports, and the SLTs were invited to use the additional information in planning their ongoing therapy. Specific targets and methods of intervention were not prescribed. The progress of the children in therapy was subsequently monitored at regular intervals, using the CELF-3, and parallel versions of the DASS. A number of interesting case studies emerged that illustrated the usefulness of the DASS in determining the priorities for language intervention. As pointed out by Seeff-Gabriel, Chiat and Pring (2012) individual profiles of language difficulties cannot be taken into account in group studies, but single case studies allow us to determine the effectiveness of a course of intervention in relation to an individual profile of skills. This article explores the profile of a child who was involved in the project and evaluates the contribution that the DASS made to his management.

Aim

The purpose of the current study was to document the amount of progress made in intervention by 'George', a 9 year old boy with a specific language impairment, who was receiving therapy in the language base attached to his school. The Dynamic Assessment of Sentence Structure (DASS, Hasson, 2011) was used to elicit more detailed and varied information about George's performance during a language task,

and to inform the strategies used in therapy. Changes in his rate of progress were monitored by repeated administration of assessments. The research question was: Do therapy targets informed by the data derived from the DA in addition to other sources of information result in improved outcomes from intervention in comparison to the outcomes of interventions based on the other sources alone?

Design

The current study included a baseline which consisted of the progress measured during a period of regular ongoing intervention that had been, and continued to be the model of the management of the child. It was not possible or appropriate to include a true 'no treatment' phase. Results of the tests for eligibility for the study i.e. the Ravens CPM and the CELF-3(UK) were made available to George's SLT, to use in planning baseline intervention, but the findings of the first administration of the DASS were not released. After one term, George was reassessed using the CELF-3(UK) and a parallel form of the DASS. In the second treatment phase, George participated in revised intervention which was informed by the outcomes of the Dynamic Assessments, at Time 1 and 2 as well as the CELF.

Change in performance measured over time in both time periods was thought to be attributable to the effects of practice of both tests, and the effects of the intervening learning from SLT intervention. Thus comparison of changes in score

from Time 1 to Time 2, and from Time 2 to Time 3, reflected the difference in learning rate resulting from the differing interventions in those periods.

The participant

George (a pseudonym) was aged 9;1 at the start of the study, which coincided with the start of the academic year, in September. He was referred by his SLT and satisfied the criterion of performance below one standard deviation on a standardised test of language, with primary language difficulties, i.e. not secondary to global learning difficulties, hearing impairments, behavioural disorders or ADHD. The results of the initial assessment of George are presented in the next section.

Time 1 Baseline Assessment

Preliminary testing revealed a non-verbal reasoning raw score on the Ravens CPM of 35, placing George on the 95th percentile, and a score of 10 on the Strengths and Difficulties Questionnaire (SDQ, Goodman 1997), indicating ratings within normal limits for all behavioural aspects, and no abnormal indicators of hyperactivity. The scores for his performance on the CELF-3(UK) are shown in Table 1.

Only the score for 'Formulating Sentences' was within normal limits, (Standard score between 7 and 13) and although this score raised the Expressive language standard score to 71, the Total score was not above the lowest possible total standard score and a percentile ranking of 1. This contrasted strongly with the high percentile for non-verbal reasoning, and thus was consistent with a diagnosis of

Specific Language Impairment. It also confirmed that George did not consistently under-perform in formal test situations. George was receiving language therapy within the language resource base of a mainstream school.

It was observed at the time that George formulated long, poorly constructed and imprecise sentences. For example, when asked to produce a sentence containing the word 'because', George produced '*The two boys and the dog wanted to cross. They had to wait because the man had to direct first then the two man and the dog could get across*'.

The DASS was then carried out, according to the guidelines described in Hasson et al (2012). The DASS requires the child to formulate two different sentences from a set of words given on a card. There are twelve items and two sentences are scored for each (=24 items). If the child struggles to formulate sentences independently the examiner prompts the child using a hierarchy of cues that are mediated to the child as required by the individual child and in response to the child's attempts. The level of cuing reached before the child achieves each sentence results in a score, (1-5) for each sentence. The total number of cues required by a child to complete the entire test, (min 24, max 120) as well as a breakdown of the number of cues at each level, was calculated (see Table 2). In addition, the amount of cuing was linked to the grammatical structure of the item as an indication of the amount of difficulty the child experienced with different grammatical structures. (Grammatical structures explored in the DASS are included in Hasson et al 2012)

Fifteen items were solved correctly spontaneously. Mediation of the remaining items enabled George to attend to strategic sentence construction and focus on the detail of placement of grammatical items such as articles and pronouns. The number of items requiring additional cues of different levels is shown in Table 2, which also illustrates the calculation of a total score.

The low score (below 60) on the DA suggested good learning potential, as George responded to low level prompts. Furthermore, there was evidence of transfer of learning during the test, such as the strategy of question formation which was initially mediated and subsequently used spontaneously. Similarly, in items which contained dative constructions, having been prompted to arrange the elements into a correct sequence, George was able to rearrange semantically equivalent elements into a second sentence with fewer cues.

E.g. Item 5a: *'The brother and the sister fed the baby a bottle'* required cue level 5, specific feedback and instruction, but George was immediately able to formulate *'The sister and the brother fed the baby a bottle'* prompted only at level 3 by 'Can you rearrange the words?' Further, he was able to formulate Item 6a *'The man sent the lady a card and a present'* with a level 3 strategic prompt, and reversed the elements for Item 6b spontaneously, without any cues at all.

The DASS also revealed good metalinguistic knowledge, despite George being poor at expressing his intended meaning. It was clear, for example, that he was aware

that he needed to reverse words in the sentence, but struggled to explain this. For example, after switching semantically reversible subjects '*The dad was riding the bike and the mum was driving the car*', George explained '*I swapped it the doing around*'.

This information about metalinguistic ability, and other data obtained from the DASS was not provided to George's SLT at this stage. The SLT was asked to describe her ongoing intervention (designated 'period 1') with George. This information is summarised in Table 3.

The intervention was largely skills based at word-level, although some metalinguistic scaffolding, using shape coding, was employed. Some good progress towards the targets was made in this therapy over the course of one school term, after which George was reassessed. The reassessment at Time 2, is presented in the next section.

Time 2 Assessment

The CELF-3(UK) was repeated. The results are shown in Table 1 alongside Time 1 scores for comparison purposes.

[TABLE 1 about here]

It can be seen that George improved in the subtest of Semantic Relationships (SR), probably as a result of the intervention programme. He also showed a gain of 7

items in Concepts and Directions, although his score was still so low for his age that he obtained a standard score of 4. Considerable gain was shown in the Sentence Assembly subtest which benefits from practice and the feedback given during the DA procedure, and this, together with the SR gain, suggest good learning skills.

It was noted, however, that the score in Formulating Sentences fell by 5 points, which may reflect an incomplete grasp of the features of the target word. For example, at Time 1, given the word 'instead' George produced the sentence, *'The boys hated the books and he asked for the dinosaur book instead'*, which was given a score of 2 as the use of 'instead' was apparently correct. At Time 2, however, he produced *'Instead the boy wanted encyclopaedias, he wanted a dinosaur book'*, which was given a score of 0 for incorrect use of the target term. Although it would seem that George knew the meaning of the word, his grasp of the syntactic constraints for its use was incomplete. The standardised scoring is not sensitive to this distinction.

Despite the overall raw score gain of 17 points, George's standard score remained at the lowest level, and his percentile ranking on 1. Incremental increases in raw scores are often not reflected in standard scores, and annual gains in raw scores are lost in the comparison to norms related to chronological age. As a result, annually repeating standardised tests does not reflect changes that would be encouraging to clients and families as well as relevant to educational services.

The DASS was then carried out again, using a parallel form. Sixteen items were spontaneously solved correctly (level 1). The total number of cues that George required to complete all the sentences was 44. The number of items requiring further cues is shown in Table 2, with the Time 1 results. .

[TABLE 2 about here]

The repeated DASS suggested that George had retained skills and strategies mediated to him during the first administration of the test. No further prompting was required for George to see when a question form was required, and dative constructions required less prompting. Some difficulty was encountered with the final three items, particularly with the combination of a number of different pronouns in a sentence, (*He can put his keys on the rack*) and the use of the subordinating temporal conjunction 'after'. George had solved these anagrams more easily at Time 1 and his performance suggested either a fragile grasp of these constructions that was not stable with different examples (as exemplified in the parallel forms of the test), or a loss of concentration towards the end of the session.

After the second assessment, the results of the DASS were made available to the SLT working with George at school. A report was written (see Appendix I) briefly describing the grammatical structures with which George had difficulty and giving information about his metalinguistic knowledge and metacognitive awareness that was derived from the DASS procedure and observations of his behaviour made by

the assessor during the assessment. Some recommendations for intervention arising out of the assessment were made, although specific targets were not devised.

The frequency and duration of George's therapy sessions were unchanged in the second intervention period, but the targets were changed to more syntactic ones, as shown in Table 3.

[Table 3 about here]

Observation of the intervention revealed the use of largely paper and pencil based tasks with George providing written as well as spoken responses in a session lasting approximately 20 minutes. Several activities were used to consolidate George's grasp of target structures (see Appendix II).

The outcomes of therapy after these changes were implemented were measured by repeated administration of the CELF-3 (Time 3, start of the summer term, in May).

It can be seen in Table 3 that the therapy plan was subsequently further amended by the SLT, without further input from the experimenter or further test results (designated 'period 3'). The plan included tasks requiring greater metacognitive awareness. Finally, George was reassessed at Time 4, at the start of the autumn school term, one year after the first assessment.

Results

Gains at Time 3 and Time 4, after two further school terms of therapy, by which time George had climbed 12 percentile points on the CELF-3(UK), are shown in Table 4.

[Table 4 about here].

Strategies such as problem solving that were addressed in language therapy, and careful planning of responses that was mediated to George during the repeated administrations of the DASS, enabled George to make better use of the implicit linguistic knowledge that he had.

Some progress towards functional improvement of expression, in terms of information selected, was noted. For example, the redundant sentence '*Whenever when the children sit on their desk they have to wait two minutes until their teacher arrive at 12 o'clock*' (Time 1) was improved to '*Whenever its 12 o'clock the teacher comes in*' (Time 4).

Performance on the DASS

As part of the experimental trial of the DASS, (Hasson, 2011) the procedure was repeated at the start of each school term. The total number of cues required decreased with each successive trial, until there were only 2 items that George was

unable to complete without help. Retention and transfer of learning were confirmed as strengths for George.

Discussion

The purpose of the current study was to find out whether additional information about George's language elicited by the DASS, and used to plan successive terms of language therapy, elicited improved outcomes from intervention. The case study used repeated baseline measures so that the participant served as his own control, as recommended by Vance and Clegg (2012), and the dependent variable, namely performance on the standardised language test was collected at four time points.

Despite George having received support via SLT and a language resource base at his school, at the start of the study, a norm referenced, standardised test showed him to be achieving on the first percentile for language. Children with language impairments do not always perform reliably on static tests, but at the same time, George demonstrated non-verbal skills in the 95th percentile, suggesting that he is able to achieve highly on assessments. The language scores would be included in a review of George's educational provision at the next Annual review of his Statement of Special Educational Needs. Severity of impairment is frequently cited as a prognostic factor, (Clark and Kamhi 2013) and on the basis of the CELF-3 result at the start of the study, rapid progress in therapy would not have been predicted for George.

During the year in which the study was carried out, George's overall performance on the CELF improved up to a Total standard score of 82, which represents performance on the 12th percentile, and a substantial improvement during the year. The gains were, however, predicted by the DASS in which George obtained a low score, indicating good potential for learning. Strengths such as transfer of learning, and good awareness of the demands of the task were noted, and retention of learning was demonstrated in the repeated DASS at Time 2. These factors suggested that George should be a good candidate for intervention and be able to benefit from directed teaching, and indeed this was shown to be the case. Information of this type is not obtained from a static test, and is the unique benefit of the dynamic assessment paradigm.

In addition to the evaluation of learning potential, it was seen that targets for the subsequent periods of therapy were focussed on more metalinguistic awareness of narrative construction, passive sentence structures, multiple meanings for words, and problem solving. Few standardised tests for metalinguistic knowledge, other than of phonological awareness, are currently available. Assessments of metalinguistic awareness are usually linked to reading assessments or judgements of grammaticality, and studies investigating metalinguistic ability in clinical populations have not used normative data.

Dynamic assessments that use techniques of 'clinical interview', (Peña 2001) however, enable the tester to question the child in an individualised way in order to

probe not only the item, but related knowledge (metalinguistic) and strategy use (metacognitive). The additional probing questions and responses obtained in the clinical interview were not included in the scoring as they were carried out after the item had been solved and the cue level recorded. They would not therefore have interfered with the basic procedure and the reliability of scoring. The benefits of the additional information for increasing understanding of the children's performances, and adding to targets and strategies for intervention were thought to be considerable, and the clinical interview was considered an essential additional component of the DASS (Hasson 2011).

Nevertheless, it is recognized that the interview process was subjective and dependent on the assessor, and that there would be little consistency between examiners. In accordance with the recommendations made by Peña, recordings of the sessions and notes made during the session would be retained for inspection by others involved in the management of the child.

As the present case study, was not intended as an intervention study, no specific recommendations for targets or strategies for intervention were made by the assessor, the information provided to the SLT referred primarily to the outcomes of the assessment and observations of George that were made during the DA. Some general background to mediation was provided, however, as an explanation for the type of scaffolding that was used during the DA, and how mediation may be used in therapy. Mediation intervention is compatible with metacognitive intervention as

rules and strategies are made explicit to the learner, and it unsurprising that given information regarding George's metalinguistic and metacognitive skills, these aspects were incorporated into therapy. The study provides some support for the role of metalinguistic interventions, as advocated by Ebbels (2008), and discussed by Law et al (2008). Children such as George, whose metalinguistic skills appear to be weak, in the presence of good nonverbal cognitive skills, good strategies for problem solving, and high levels of motivation, may well benefit from a more strategic problem solving approach to language. Furthermore, intervention that makes linguistic rules explicit, would enable him to reason in linguistic terms and access higher order language structures.

The present case study lends support to the notion of detailed profiling of ability prior to the planning of intervention for language, and also at intervals throughout the episode of care. Whilst the information to be gained about an individual child is not unique to the DA, and may in fact be self evident to teachers and SLTs who have worked with the child, the time taken to elicit the information is substantially reduced. Unlike some DA procedures, additional assessment time was not required and the investment of time in assessment was justified by the quality of information obtained from the assessment, and the outcomes of the intervention..

The findings of the case study are limited in their generalisability, not only due to the individual profile, but on account of the freedom given to the SLT to generate her own targets and activities. No control was exerted over the choices made by

the individual SLT, and inevitably individual preferences come into play. Further research could define the parameters of the intervention, prescribing targets and methods that are adaptable within circumscribed limits for the individual child, according to their profile of abilities. Nevertheless, there is clear indication that children who make limited progress in intervention may benefit from alternative, more detailed assessments, and the trial of a different approach to intervention in order to improve outcomes.

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'The Author(s) declare(s) that there is no conflict of interest'.

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Appendix I. Report provided to 'George's' Speech and Language Therapist

Findings of Dynamic assessment

Name... 'George' **Date:** February

1. Detail of language structures that the child has difficulty with, that is additional to that obtained from the standardised tests

Some difficulty formulating indirect and direct object

Used possessive -s without recognizing possessive - identified as plural -s

Some confusion between pronouns 'he' and 'his'

Sometimes struggles with selection of articles and pronouns

Difficulty formulating sentence with conjunction 'after'

2. the effect of amount of content and nature of semantic content on the child's construction of linguistic structures

No difficulty with increased sentence length

Good awareness of semantic constraints and recognizes humour in inappropriate sentences

3. the child's ability to transfer, or generalise learning or strategies ie. item - to item transfer

Transfer of OdOi structure across items

Transfers, but has difficulty with accuracy of grammatical items articles and pronouns

4. *the child's metalinguistic knowledge, ability to label, explain and manipulate linguistic concepts*

Good task awareness, though unable to formulate explanation – 'have to mix it up' and later 'make a sentence'

Aware that he formulated a question.

Attempts to describe linguistic manipulation - 'changed these 3 words , left the rest the same' – not well formulated or accurate ie has metalinguistic awareness but not expression

Attempts to justify construction – 'its right because..' - but explanation is rambling and unclear and although it has some appropriate elements, such as starting with 'is', does not actually explain his meaning.

Identified aux 'is' as 'helping for doing' aware of functional use, also aware that it is used in question formation, though struggled to explain

Aware of reversible elements in sentence

Grasped explanation of possessive quickly and able to apply

Able to explain that 'isn't' = is not, and can be used in same way as 'is'

Attempts to identify aux 'can' as 'what doing'

5. *the child's metacognitive ability ie awareness of the processes and strategies that are used to solve the given task*

Spontaneously identified – 'now I'll swop it around'

Responsive to mediation of checking behaviour and attention to detail

Difficulty summarizing – recalls individual examples rather than principles

Behavioural Factors:

- *attention /activity/ emotion while engaged in the presented task*

George maintained attention very well throughout the session, with little input from tester.

- *motivation / attitude to learning / interest / response to input, while engaged in the presented task*

George seemed motivated to complete the task, wanting to solve the individual problem items. He was very responsive to input, and contributed ideas and explanations spontaneously

- *use of strategies, including reliance on others for help*

George attempted to use strategies to complete the items, was aware that he had manipulated the words in definite ways, although he was not really able to explain what he was doing. He was responsive to help, but did not actively seek input nor did he rely on the tester, but continued to work at the items himself.

Summary:

- learning needs, ie whether the individual requires metacognitive monitoring, strategy training or item specific application of knowledge
- the individual's learning needs in terms of amount of input required from examiner

George was able to arrange most of the sentences independently, and seemed to find the structured task easier than having to formulate expressive language spontaneously. His language is characterized by long and rambling constructions and a lack of precision in getting his meaning across. There is a lack of detail and accuracy, resulting in confusion of some structures eg articles and pronouns.

George attempted to impose order on his responses and explain or justify what he had produced, however these explanations were imprecise and George did not seem to have the vocabulary and concepts to explain himself. His metalinguistic knowledge is implicit, he indicated that he was aware of the manipulations, but was unable to express them clearly. There is a need for George to increase his metalinguistic vocabulary alongside syntactic expression to reason linguistically and develop higher level language structures. George has a good semantic understanding and appreciates absurdity and humour, although the structural details are not grasped.

In the first CELF-3 test in October, George's expressive language score was higher than his receptive language, and although this may be an artefact of testing, George's attention to detail and careful gathering of information may be impaired so that he does not fully process incoming language. He has difficulty following instructions and checking that he has planned his responses carefully. His teacher identified several functional difficulties related to attending to and processing verbal information, instructions and rules.

In summary, it would appear that George's typical performance does not reflect the extent of his knowledge. He would benefit from improvement of his cognitive functioning – increasing awareness and control over behaviours such as careful gathering of information, attention to detail, checking, selecting and planning his responses, and reflecting on his performance. He demonstrated responsiveness and understanding of some of these concepts during the DA. These generalisable skills may enable him to perform better in language tasks, and in class.

Appendix II Methods and activities used by SLT during consecutive terms of therapy with George.

	Period 1	Period 2
Methods / Activities	<p>i. G was required to match present tense with verbs with their past tense forms (Regular/irregular pairs)</p> <p>ii. Comprehension task, G was required to identify pairs of words with the same meaning, and opposite meanings</p> <p>iii. G was required to describe a sequence of 6 picture cards using shape coding to scaffold his responses.</p>	<p>i. Sorting present and past tense verb forms. Generating an irregular verb from a present tense form. Practice using irregular verbs at sentence level.</p> <p>ii. A story planner focusing on: Who? What doing? Where?, Beginning, middle and end, was used to help G construct a more coherent narrative.</p> <p>iii. Discussion regarding reversible passive sentence structures, with examples. G constructed reversible passive sentence structures from a muddled collection of words. G reflected on both content (meaning) and structure of sentence.</p>

Table 1. Results of the CELF-3(UK) for George at Time 1 and Time 2.

	TIME 1		TIME 2	
	Raw score	Std score	Raw score	Std Score
Concepts and Directions	10	3	17	4
Word Classes	12	4	11	4
Semantic Relationships	7	5	12	7
Receptive Total	29	65	40	71
Formulating sentences	23	7	18	3
Recalling Sentences	17	3	21	3
Sentence Assembly	5	5	12	10
Expressive Total	45	71	51	71
Total	74	65	91	65

Table 2: Cue levels, and the breakdown of scoring on the DASS for George at Time 1 and Time 2

Breakdown of cues	TIME 1		TIME 2	
	No of items	Score	No of items	Score
Score 1 - spontaneous problem solving	15	15	16	16
Score 2 - broad metacognitive cues, such as 'How have you done this before?'	2	4	1	2
Score 3 - strategic prompts such as 'Can you rearrange the words?'	3	9	2	6
Score 4 - breaking the item down into smaller chunks	3	12	5	20
Score 5 - item specific feedback or instruction	1	5	0	0
Total Score		45		44

Table 3. Targets of Intervention for George in consecutive blocks of therapy.

	Period 1	Period 2	Period 3
Targets	<p>i. To develop G's use of targeted irregular past tense verbs in structured tasks</p> <p>ii. To develop G's understanding of 'opposite' vocabulary</p> <p>iii. To develop G's understanding of synonyms</p>	<p>i. To develop G's use of irregular past tenses</p> <p>ii. For G to use a story planner to construct his narrative. G to reflect on its content and structure</p> <p>iii. To develop G's understanding and use of reversible passive sentence structures.</p>	<p>i. To develop G's understanding of multiple meanings of words (using word webs)</p> <p>ii. To develop G's problem solving and prediction skills (using 'Think about it' and mind maps)</p> <p>iii. To develop G's awareness of good conversational skills</p>

Table 4. Results of the CELF-3(UK) for George at Time 3 and Time 4.

Subtests	Raw scores		Standard Scores	
	Time 3	Time 4	Time 3	Time 4
Concepts and Directions	17	25	4	8
Word Classes	13	24	5	9
Semantic Relationships	14	16	8	9
Receptive Total	44	65	71	91
Formulating sentences	21	26	5	6
Recalling Sentences	25	18	6	3
Sentence Assembly	10	13	8	9
Expressive Total	56	57	76	73
Total	100	122	74	82

