

Parameters of Service Delivery and the Strathclyde Language Intervention Program (SLIP)

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ABSTRACT

How should speech and language pathologists (SLPs) best proceed in delivering language services to children and young people? In this chapter, we describe the Strathclyde Language Intervention Program (SLIP) (McCartney et al., 2004) a manualized intervention which was developed for use by SLPs and their assistants working with individual children and small groups of children aged 6 to 11 years with primary (specific) language delay. We also consider its underlying theory and empirical basis, its practical requirements and key components, and outline an individual child's journey through the program. We locate the program within the literature for this population by considering four key parameters of service delivery (dosage, format, setting and provider) and reviewing the evidence base for whether they make a difference to the outcomes of intervention. We conclude with a consideration of future directions for further research and study of the effects of different service delivery options.

INTRODUCTION

SLPs in the US and Canada and their counterparts elsewhere ("speech pathologists" in Australia, and "speech and language therapists" in the UK, Ireland, South Africa and New Zealand) work with a wide range of children with communication disorders. Some 6-7% of all children at school entry may present with specific language impairment (SLI) (Tomblin et al., 1997), a primary delay that cannot be accounted for by low non-verbal ability, hearing impairment, behavior problems, emotional problems, or neurological impairments. For other children, language problems may be secondary to autism spectrum disorder, sensory impairment, or more general developmental disabilities.

Differences in the criteria used to identify these problems can result in variability in prevalence estimates of language problems, particularly for SLI (Plante, 1998; Stark & Tallal, 1981). This variability can be further increased by overlaps, or comorbidities, between language disorders and speech problems (Shriberg, Tomblin, & McSweeney, 1999), literacy and behavior problems (Tomblin, Zhang, Buckwalter, & Catts, 2000), attention deficit/hyperactivity disorder (ADHD) (Tannock & Brown, 2009) and problems in cognitive functioning, such as intellectual disability, learning disabilities, problems with working memory and executive functions (Boyle, McCartney, O'Hare, & Law, 2010; Law, Boyle, Harris, Harkness, & Nye, 2000).

SLIP (McCartney, 2007; McCartney et al., 2004) was devised for a large-scale RCT comparing the effects of format (individual versus group) and provider (SLP versus SLP assistant) on language outcomes for elementary school-aged pupils with language impairment.

TARGET POPULATION

SLIP was designed to meet the needs of children aged 6 to 11 years with primary (specific) language impairment. One hundred and sixty-one children from the cities of Edinburgh and Glasgow and surrounding areas in Scotland were randomized to either a control group, receiving their on-going community therapy, or to one of four project language therapy conditions. These were therapy delivered either directly by a project SLP or indirectly via a project SLP assistant, and both formats to children individually or in groups.

Children were referred by their local community SLP, and ethical permission and informed consent was obtained. To be eligible for the RCT, children had to be aged 6 to 11 years and attend their local mainstream elementary school, which is the usual setting for children with language impairment in Scotland. They also had receptive and/or expressive language standard scores < 1.25 below the mean on the Clinical Evaluation of Language

Functions-3, United Kingdom edition (CELF-3^{UK}) (Semel, Wiig, & Secord, 2000), that is, scores falling around the lower 10th percentile, and non-verbal IQ scores > 75 on the Wechsler Abbreviated Scale of Intelligence (WASI) (Wechsler, 1999). It is estimated that this group comprises around 6% of school entrants (Tomblin et al., 2000) and their future educational, social and life outcomes can be compromised by their language challenges. Children had no reported hearing loss and no concomitant articulation, phonology, dysfluency or social-communication problems requiring the specialist skills of the SLP. Therefore, following practice patterns in the UK, it was possible to randomize them to receive therapy from an SLP assistant.

THEORETICAL BASIS

The RCT investigated different models of delivering existing language interventions, rather than creating a new intervention. All four research models aimed to effect language change, as evidenced by meaningfully increased scores on the language outcome measure and reflected in surveys of schools and family members. The practical requirement was to plan and deliver appropriate language therapy for research children working with five research therapist-assistant pairs in two cities. Therapy had to be specified sufficiently carefully to guide research SLPs towards providing comparable child experiences, and to allow future research replication. Broad age and language characteristics of the children were pre-determined, but their individual language needs were predicted to vary. A literature review was undertaken, and the research SLPs wrote a Language Therapy Manual (LTM) (McCartney et al., 2004) to specify decision-making criteria for selecting language targets and activities, and to provide a catalogue of language learning activities conforming to evidence-based approaches.

Search of the academic and professional literature (McCartney et al., 2004) resulted in four areas for therapy intervention:

- Comprehension monitoring, adapted from Johnson (2000): helping children to identify speaker and listener aspects of successful comprehension, and to seek clarification when they did not understand.
- Vocabulary development therapy: helping children to comprehend, learn and use words relating to concepts relevant in schools, and teaching children self-cueing strategies to help them retrieve new vocabulary items. Following Hyde Wright (1993) and Lewis and Speake (1997), the approach included reflecting on the meaning, phonological and semantic aspects of selected words and using memory and rehearsal techniques. Vocabulary from the mathematics and literacy school curriculum, school topic vocabulary and words relating to concepts, questions and directions were used to focus word learning, but the emphasis was on child self-reflection and the development of independent strategies for learning words.
- Grammar therapy: teaching age-appropriate understanding and use of grammar. A list of later grammar markers was collated, to be taught in salient contexts following Fey and Proctor-Williams (2000). The work of Bryan (1997) on ‘Colourful Semantics’ was adapted to provide activities highlighting the relationships that underlie syntactic structures.
- Narrative therapy, teaching comprehension and use of oral narrative, based on Shanks and Rippon (2001).

A straightforward account explaining and interpreting these areas was written to be intelligible to the research SLP assistants, cross-referenced to the original sources, and a list of suitable published materials and activities was collected for each area, collated into the project Language Therapy Manual (LTM) (McCartney, 2007).

EMPIRICAL BASIS

The "evidence map" approach of the American Speech-Hearing-Language Association (2011-2014) identifies *dosage*, *format*, *provider* and *setting* as key components of interventions. While the empirical basis for SLIP focuses upon format and provider, it is helpful to review the evidence base for each of the components in turn.

Dosage

Intervention is designed to bring about change, and accordingly should be scheduled to maximize the time available to ensure sufficient intensity to achieve change. Such scheduling is underpinned by work demands and caseload; the setting for the intervention; and the nature of the treatment approaches (To, Law, & Cheung, 2012). The concept of "dosage" is a means of quantifying the intensity of treatment. As Warren, Fey, and Yoder (2007) note, it may be best understood as a product of the average number of teaching episodes in an intervention session, the frequency of the intervention sessions, and the total duration of the intervention. These components are held to have a multiplicative effect and can thus be combined to determine the "cumulative intervention intensity" (CII), that is, the total number of teaching episodes in a program during its duration, using the following equation:

$$\text{CII} = \text{episodes} \times \text{frequency of sessions} \times \text{total duration of the intervention}$$

Format (e.g., Individuals or Groups)

Treatments may vary in terms of format, for example, whether they are delivered to individuals or groups. The age of the child, the nature and severity of the speech/language problem, the aims of the intervention, the requirements of effective programs, the SLP's caseload, and the availability of other suitable children for group-based intervention are all determinants of whether individual or group-based delivery would be the more effective, acceptable and feasible (Liddle, James, & Hardman, 2011; Marvin, 1998).

Setting (i.e., Intervention Context)

Intervention may take place in a range of different settings, depending on perceived needs of the child, policies of individual speech and language therapy services, and the resources available. For example, a pre-school aged child may be seen at home in a family context, or in a clinic setting, while older children might be seen in the setting of a school or other educational establishment (Nelson, 2010).

Educational settings provide a number of different intervention contexts (Nelson, 2010). Following IDEA (2004) and the principles of inclusion (McGinty & Justice, 2006; Nippold, 2012), these include regular or mainstream classrooms or early education settings, with opportunities for linking intervention to the curriculum and for transfer and generalization of therapy outcomes in a setting with peers who have typical language development.

A more traditional, intervention context involves the use of “pull out” services (also called withdrawal or extract), whereby an individual or small group of students is removed from a mainstream, regular classroom to a quiet room to provide more control over the level of structure in program activities, to minimize distraction, or to provide more opportunities for turn-taking or developing the use of new skills.

However, not all students with speech/language problems attend mainstream schools. Some of those with comorbid general learning disabilities or additional sensory problems may be placed in special education settings and may receive their therapy in specialized classrooms in regular or separate school buildings.

Provider (i.e., Intervention Agent)

Turning to agents of intervention, direct intervention is delivered by an SLP working with individual or grouped children/young people, and indirect therapy is delivered through a

third party (such as a parent, other caregiver, or teacher) who receives training in the delivery of the intervention and works under the direction of a qualified SLP.

Involving parents and care-givers has important implications because, if successful, it provides opportunities for delivering interventions to very young children with language disorders or at risk of developing such problems, and for enhancing the acquisition of language skills across different settings leading to generalization and maintenance. In a similar vein, involving teachers, classroom assistants and other professionals in joint endeavors via a transdisciplinary format (Gascoigne, 2006) may also enhance language skill acquisition. Indirect therapy exemplifies the consultative, collaborative role of the SLP in joining with those who work directly with the children or young people to facilitate the development of communication skills by positive interactions, often in more naturalistic contexts (Law et al., 2002).

Direct intervention may also be delivered on-line as telepractice (Towey, 2012), a mode of service delivery of assessment, intervention and consultation approved by ASHA (2010). Telepractice can be delivered in real time (synchronous), mirroring more traditional in-person approaches, or using time-delay (asynchronous), which allows further analysis or viewing at a convenient time by the SLP or forwarding the video and audio information for consultation with professional colleagues (ASHA, 2013).

Levels of Evidence

The Scottish Intercollegiate Guidelines Network (SIGN, 1999) provides a hierarchy of 'Levels of Evidence' which is used to grade the quality of research evidence of the effectiveness of interventions. Systematic reviews and meta-analyses of well-conducted randomized controlled trials (RCTs) are held to represent the highest levels in the hierarchy of quality of research evidence to determine effectiveness.

Insert Table 17.1 about here.

Evidence-based systematic reviews of effectiveness of intervention for speech, language and communication problems generally restrict their inclusion criteria for study design to RCTs, quasi-experimental designs and single-subject experimental designs (Cirrin et al., 2010; Law, Garrett, & Nye, 2003; Schooling, Venedickov, & Leech, 2010; Zeng, Law, & Lindsay, 2012). However, while the methodology of the systematic review is not without its critics (Pring, 2004, 2006), key features of a well-conducted, well-designed RCT such as investigator control over the intervention, the selection of participants and random allocation to conditions provides control for sources of bias (not the least of which is regression to the mean; Zhang & Tomblin, 2003), and crucially allows causal inferences to be drawn (Torgerson & Torgerson, 2008).

Here we examine the findings from recent systematic reviews of studies of intervention using RCT, quasi-experimental and single-subject experimental designs, that address specific questions of whether dosage, format, setting or provider have any systematic effects upon outcomes. We will also add to these relevant findings from more recent studies using these research designs published after the time-periods covered by the reviews. Table 17.1 locates the reviews and individual studies discussed within the ‘Levels of Evidence’ framework and Table 17.2 shows a roadmap of the aspects of service delivery specifically addressed by four recent systematic reviews.

Insert Table 17.2 about here.

Evidence Regarding Service Delivery Parameters

Dosage Effects

There were too few studies with relevant details of length and number of sessions for Law et al. (2003) in a systematic review to carry out direct comparisons of the effects of intensity of dosage apart from duration of treatment. Instead, they used a cut-off of 8 weeks

to examine whether duration made a difference. However, there were also too few studies to directly compare effect sizes from programs lasting 8 weeks or less and those lasting longer by statistical analysis. Instead, Law et al. (2003) reported whether effect sizes changed depending upon whether programs of shorter duration were removed from the analysis. Their findings revealed that standardized assessment outcomes for expressive phonology showed significant overall effects of intervention ($d = 0.44$, 95% CI [0.01, 0.86]), which increased for programs running for more than 8 weeks ($d = 0.74$, 95% CI [0.14, 1.33]). There were no significant overall effects of intervention for receptive syntax ($d = 0.01$, 95% CI [-0.53, 0.55]) or expressive syntax ($d = 0.28$, 95% CI [-0.19, 0.75]), although the effect sizes for treatment delivered by clinicians for expressive syntax increased when only programs of over 8 weeks duration were considered ($d = 0.43$, 95% CI [-0.06, 0.93]).

Interestingly, Law et al. (2003) found that intervention for expressive syntax was significantly effective for children who had expressive language difficulties but no receptive difficulties ($d = 1.02$, 95% CI [0.04, 2.01]). No details were provided as to whether there was any further difference that could be attributed to duration of program. On the basis of these findings, Law and colleagues cautiously concluded that there were indications that program of 8 or more weeks might be more effective than those of shorter durations.

More recently, Schooling et al. (2010) examined findings regarding frequency, intensity and duration of intervention from 10 of 17 studies, eight quasi-experimental controlled studies and two single-case experimental designs, that met the criteria for their systematic review of the effectiveness of service delivery for pre-school children. Five presented findings for more than one component of dosage, which when compared to the findings of Law et al. (2003), reveals a trend over time towards more complete reporting of study details. Schooling and colleagues noted that six of the controlled studies yielded effect sizes, thus providing 35 effect sizes in total, with their associated 95% CIs. However, only

seven effect sizes achieved what (Schooling et al., 2010, pp. 10-11) define as clinical significance (i.e. statistical significance at the $p < .05$ level). Of these, six effect sizes favored more intensive intervention, with effect sizes ranging from $d = 0.74$, 95% CI [0.09, 1.37] to $d = 1.77$, 95% CI [0.44, 2.86], indicating that more frequent sessions resulted in greater gains. Interestingly, however, one study revealed that children receiving one session of intervention per week produced more spontaneous utterances in a language sample of parent-child interaction than those receiving four sessions per week ($d = -1.17$, 95% CI [-1.82, -0.47]).

Zeng et al. (2012) examined the effects of dosage on outcomes from 20 RCTs identified via systematic review (Law, Boyle, Harris, Harkness, & Nye, 1998; Law et al., 2003; Law, Garrett, Nye, & Dennis, forthcoming). These included outcomes from phonology interventions ($n = 9$), syntax interventions ($n = 10$) and vocabulary interventions ($n = 7$). Zeng et al. found that there was no overall positive relationship between dosage and outcome in terms of effect size across these studies. Instead, amongst a matrix of non-significant correlations, the only significant correlations were negative, ranging from $-.849$ to $-.655$, indicating that greater changes were associated with less frequent intervention. However, treatment approaches differed not only in session length and dosage (with vocabulary interventions involving more intensive intervention than phonology interventions), but also in effectiveness.

These findings by Zeng et al. (2012) raise the important point that dosage has to be interpreted in the light of treatment effectiveness. As Yoder, Fey, and Warren (2012, p. 411) put it: "...more [is] not generally better" and greater attention has to be paid to the complexities of understanding dosage effects in the light of treatment goals and intervention components and also the spacing of sessions with regard to massed versus distributed practice effects (Schooling et al., 2010). Zeng and colleagues further note that not all of the metrics of dosage such as 'dose' or teaching episodes, frequency of sessions or total duration of the

intervention proposed by Warren et al. (2007) are routinely reported in published studies.

This poses problems for identifying cumulative intervention intensity (CII) and the extent to which dosage variables make a difference.

Turning to studies published outside the time-periods covered by these reviews, a recent large scale RCT carried out by Broomfield and Dodd (2011) with 730 participants from pre-school to 16 years of age with primary language impairment revealed that those receiving an average of 5.5 hours of therapy (range 0-24 hours) over a 6 month period made significantly more progress in speech, expressive language and language comprehension than no-treatment controls ($p < .001$). Unfortunately, it was not possible to calculate an effect size from the data presented in the paper.

A further recent RCT carried out by Allen (2013) illustrates the importance of the effectiveness of intervention and also of its relation to language domain, in this case, phonology. Allen randomly assigned 55 pre-school children with phonological difficulties to one of three conditions: one group receiving an intervention based on the multiple oppositions approach (Williams, 2000) three times a week for 8 weeks; a second group receiving the intervention once per week for 24 weeks; and a control group receiving an intervention designed to develop print awareness (Justice & Ezell, 2001). The results revealed that after 8 weeks, the condition that involved participation in the three sessions per week of the multiple opposition approach resulted in significantly greater improvement compared to both one session per week ($d = 0.72$) and the control intervention ($d = 0.95$). Even when cumulative intensity of intervention was taken into account, there was a significant difference between the outcomes from 24 sessions delivered over 8 weeks and 24 sessions delivered over 24 weeks, in favor of the more intensive model of delivery ($d = 0.69$).

Format (Individual versus Group) Effects

With regard to individual versus group therapy, Law et al. (2003) synthesized the findings from four RCTs of phonology intervention and an RCT of intervention in expressive language, all of which compared outcomes from individual and group-based interventions. The results, collapsed across language domain, revealed no significant differences between the two models of intervention ($d = 0.01$, 95% CI $[-0.26, 1.17]$).

Cirrin et al. (2010) reported the findings from three studies, two RCTs and a single-case experimental design, that compared individual versus group formats but were unable to synthesize the results because the format of service delivery in one of the RCTs and in the single-subject experimental design was confounded with setting. An RCT, which we carried out (Boyle et al., 2007), directly compared individual and group intervention and revealed no differences between individual and group-based delivery for either receptive language outcomes delivery ($d = -0.08$, 95% CI $[-0.43, 0.27]$) or for expressive language ($d = -0.005$, 95% CI $[-0.34, 0.34]$).

Finally, Schooling et al. (2010) analyzed the findings from six studies, four RCTs and two single-subject experimental designs, comparing individual and group delivery to elementary school students. Effect sizes from the RCTs revealed no clear-cut advantage for either individual or group delivery. For example, in one study (Eiserman, Weber, & McCoun, 1990), individual therapy resulted in greater intelligibility in an SLP-child language sample than group therapy ($d = 0.74$, 95% CI $[0.09, 1.37]$) and greater responsivity to requests in a parent-child language sample ($d = 0.82$, 95% CI $[0.15, 1.46]$), while group therapy resulted in more spontaneous contributions than individual therapy in the parent-child language sample ($d = -1.17$, 95% CI $[-1.82, -0.47]$).

Evidence from economic evaluations indicates that group-based interventions may be cost effective (Boyle, McCartney, Forbes, & O'Hare, 2007; Dickson et al., 2009). In addition, group-based interventions may offer additional benefits, for example, by providing

opportunities and contexts for social exchange, generalization of skills and peer support, as well as reducing overdependence on adults (Marvin, 1998).

Setting Effects

Law et al. (2003) focused their meta-analysis upon outcomes from intervention across language domains but also noted the confounding between setting and provider in many studies, for example, between home-based and parent-administered intervention. That said, they report the findings from a comparison between “pull-out” and classroom-based interventions (Wilcox, Kouri, & Caswell, 1991), which showed no significant difference between the two settings in terms of outcomes for expressive language ($d = 0.35$, 95% CI [-0.53, 1.24]).

Cirrin et al. (2010) reported the findings from two relevant studies examining the effects of setting upon outcomes for vocabulary for pupils with language impairment. The first of these, Throneburg, Calvert, Sturm, Paramboulakas, and Paul (2000), was a large-scale study ($N = 177$) that compared the outcomes for vocabulary following three interventions delivered in three different settings: a classroom-based intervention involving collaboration between teachers and SLPs; a classroom-based intervention delivered by SLPs alone; and traditional, “pull-out” intervention delivered by SLPs outwith the classroom. Throneburg and colleagues reported a significant difference between the collaborative team-teaching approach and the pull-out intervention ($p < .05$) based on analyses of mean test gain that favored the classroom-based intervention, although no difference was seen between pull-out and the classroom-based delivery by SLPs. Cirrin et al. (2010) calculated an effect size of $d = 0.30$ based upon post-test scores reported in the original paper that favored the collaborative approach relative to pull-out and concluded that this effect size is significant. Our own analysis of this effect size and its 95% CI indicates that while there is a difference in terms of gains, the difference between post-test scores for the two settings was not significant ($d =$

0.31, 95% CI [-0.85, 1.42]). Cirrin et al. (2010) also report findings from a small-scale study (N=14) carried out by Bland and Prelock (1995) comparing individual, direct pull-out service delivery with classroom-based collaborative service delivery. That study revealed a greater number of intelligible and grammatical utterances following classroom-based delivery ($p = .025$), but no other significant differences. Cirrin and colleagues noted that they were unable to calculate effect sizes for this study. Format and provider were also confounded with setting in that study.

Schooling and colleagues, in their review of the evidence-base for the effectiveness of intervention for pre-school children, reported findings from nine RCTs comparing clinic/center/school-based versus home-based intervention (five studies); traditional ‘pull-out’ versus classroom-based intervention (two studies), and segregated versus inclusive classrooms (two studies). As before, their meta-analysis revealed clinically-significant effect sizes (defined as statistical significance at the $p < .05$ level) for only a minority of the interventions reported. The only study comparing clinic versus home-based treatment that yielded intervention effects of practical significance was that of Eiserman et al. (1990). However, setting and format were confounded in this study because the clinic-based intervention was group-based, and the home treatment an individual intervention. Accordingly, the effect sizes and associated CIs for clinic and home interventions are those reported above for group versus individual, with more spontaneous contributions by the treated individual following the clinic-based (group) intervention, but greater responsivity and intelligibility following the home-based (individual) treatment.

Of the findings comparing the effects of segregated and inclusive classrooms, only two effect sizes were of clinical significance and these revealed that pre-school children with more severe difficulties in inclusive classrooms had larger change scores on standardized subtests of auditory comprehension ($d = 0.81$, 95% CI [0.19, 1.38]) and expressive language

($d = 0.84$, 95% CI [0.22, 1.42]) than those in a segregated setting. However, there was no effect of setting for children who had less severe impairments and none of the studies comparing ‘pull-out’ with classroom or collaborative models of service delivery yielded clinically-significant outcomes.

Provider Effects

As before, Law et al. (2003) reported the findings from their systematic review by language domain. In the case of outcomes for expressive syntax, three studies directly compared intervention delivered by trained parents with that delivered by clinicians. The results aggregated across a total of 30 children receiving treatment and 36 controls revealed no significant differences between provider type in terms of standardized measures of overall syntactic ability ($d = -0.04$, 95% CI [-0.56, 0.48]), total utterances ($d = 0.15$, 95% CI [-0.45, 0.74]), mean length of utterance (MLU) from language samples ($d = 0.28$, 95% CI [-1.41, 1.96]) or parental report ($d = 0.01$, 95% CI [-0.63, 0.66]).

Two studies reporting outcomes for expressive vocabulary met the inclusion criteria for the review (Law et al., 2003). Their findings also revealed no significant differences in standardized post-intervention test scores between parent-administered and clinician-administered intervention delivered to a total of 20 children receiving treatment and 25 controls ($d = 0.20$, 95% CI [-0.40, 0.79]) Significant differences between parent- versus clinician-administered intervention were similarly not reported for either parental report of vocabulary ($d = -0.16$, 95% CI [-0.76, 0.44]) or the number of words in a language sample produced by the treated child ($d = -0.50$, 95% CI [-1.48, 0.47]).

A similar pattern of results was observed from the findings from three studies of intervention for problems in expressive phonology delivered to a total of 65 children in the treatment group and 65 controls (Law et al., 2003). Specifically, there was a sizeable overall treatment effect in favor of parent-administered intervention, but this effect failed to reach

conventional levels of statistical significance due to marked variability in the findings across the individual studies ($d = 0.66$, 95% CI $[-0.47, 1.80]$). For example, while one of these studies failed to show any significant difference between parents and clinicians ($d = -0.90$, 95% CI $[-2.25, 0.44]$), the aggregated effect size from the remaining two studies involving 120 children in total favored parent administration ($d = 1.20$, 95% CI $[0.17, 2.23]$). However, when we consider the effectiveness of intervention relative to a no-treatment control group, the results reveal the effectiveness of intervention delivered by clinicians only ($d = 0.67$, 95% CI $[0.19, 1.16]$, aggregated across 5 studies) and combined intervention programs delivered by clinicians and parents ($d = 0.44$, 95% CI $[0.01, 0.86]$, aggregated across 6 studies). In contrast, the effect size for intervention delivered by trained parents alone failed to reach conventional levels of statistical significance ($d = -0.17$, 95% CI $[-0.72, 0.39]$, aggregated across 2 studies).

There was one unpublished study reviewed by Law et al. (2003) which directly compared outcomes from parent-delivered intervention ($N=11$) and that delivered by clinicians clinician-delivered intervention ($N=17$) with a delayed treatment control group ($N=10$) (Law, Kot, & Barnett, 1999). The findings revealed no significant differences in standardized measures between the two providers for receptive syntax ($d = -0.11$, 95% CI $[-0.87, 0.65]$), expressive syntax ($d = -0.49$, 95% CI $[-1.26, 0.28]$) or expressive vocabulary ($d = 0.11$, 95% CI $[-0.65, 0.87]$).

However, it is worth noting again that there was no evidence for the effectiveness of parent-administered intervention relative to a no-treatment control group in terms of change in standardized language test scores (Law et al., 2003; Law, Garrett, & Nye, 2004).

Cirrin et al. (2010) reported the findings from only one study, an RCT (Boyle et al., 2007), that directly compared direct versus indirect service delivery, in this case SLPs versus trained speech and language therapy assistants (using SLIP). The results from an intention-to-

treat analysis (Bywater, 2012) of the outcomes for 161 children aged 6-11 years revealed no significant differences in standardized test scores at immediate post-intervention for either receptive vocabulary ($d = -0.01$), receptive language ($d = 0.15$) or expressive language ($d = 0.06$). Similarly, there were no differences at 12 months follow-up (all d -values ≤ 0.01).

Finally, Schooling et al. (2010) reported the findings from four controlled studies directly comparing direct versus indirect service delivery (here, clinicians versus trained parents), for interventions with pre-school children. They were able to compute effect sizes for only three of the studies, and these revealed no significant differences between providers in terms of standardized test scores. However, there was a mixed pattern of results from measures derived from parent-child language samples such as MLU, percentages of child's responses to requests and percentages of child's spontaneous utterances. The results favored indirect service delivery in the case of MLU ($d = 1.24$, 95% CI [0.14, 2.2]) (Gibbard, 1994 Study 2) (Study 2) and responses to requests ($d = 0.82$, 95% CI [0.15, 1.46]), and intelligibility of utterances ($d = 0.74$, 95% CI [.09, 1.37]) (Eiserman et al., 1990). On the other hand, the results favored direct service delivery in the case of the percentage of spontaneous utterances by the child in a parent-child language sample ($d = -1.17$, 95% CI [-1.82, -0.47]) (Eiserman et al., 1990). However, the reader will note that provider and format are confounded in the Eiserman et al. (1990) study, as direct, clinician-administered therapy was group-based.

Turning again to studies published outside of the time-periods covered by these reviews, Grogan-Johnson et al. (2013) randomized 14 children (ages 6 to 10 years) with speech sound disorders to either a telepractice model of service delivery or a "side-by-side" model (where the SLP's assistant was present in the room with the child). Under both delivery conditions, a computer-delivered speech sound intervention was implemented for an average of nine 30-minute sessions over a 5-week period. The findings revealed no

differences between the two models of service delivery in the progress made by the children, although the design lacked a no-treatment control group and the number of participants was small.

Summary Evaluation of Evidence on Service Delivery

Thus far, the findings of studies examining variables associated with service delivery reveal a complex picture. There is evidence for the effectiveness of speech and language therapy, but considerable variability in outcomes is observed across language domains. There are also numerous methodological limitations. Several studies discussed above had small sample sizes, adversely impacting upon the statistical power of comparisons (Cohen, 1992). In addition, outcomes were measured using a variety of instruments making the studies difficult to interpret as a group because of a lack of comparability across outcome measure. With specific regard to the key parameters reviewed here, studies frequently failed to report details of the four components of dosage, and the parameters of format and setting, format and provider, and setting and provider frequently confounded. There is also a near absence of studies that used a factorial design, the best design to use to provide direct comparisons between different models of service delivery. Only one study included in the reviews above, Boyle et al. (2007), used a factorial design and large sample size to permit direct comparisons between format (individual versus group) and provider (SLP versus SLP assistant) and provides the empirical basis of the efficacy of SLIP to which we shall now turn.

Evidence of Efficacy of the SLIP

The study that provides the primary efficacy evidence for SLIP (Boyle et al., 2007; Boyle, McCartney, O'Hare, & Forbes, 2009) is a Phase III trial (MRC, 2000) that was designed to compare the SLIP with on-going community-based language therapy. It met all PEDro-P quality criteria except for two that can rarely be met by therapy studies: neither the

providers nor the children receiving therapy were blind to the intervention arm to which they were allocated (Speechbite, no date).

The CELF-3^{UK} (Semel et al., 2000) which was used in a pre-intervention assessment at Time 1 (T1) to determine eligibility for the study was repeated immediately after completion of the child's intervention (T2) at 3 months and again at a follow-up assessment after one year (T3), during which no project therapy had been delivered. Children who entered the study also completed the British Picture Vocabulary Scale-II (BPVS-II) (Dunn, Dunn, Whetton, & Burley, 1997) and recorded an informal oral narrative sample, in response to a request for a recount. CELF parental and (where possible) teacher questionnaires (Semel, Wiig, & Secord, 1996) were also collected. These assessments helped the research SLPs to plan therapy.

Insert Figure 17.1 about here.

The flow of children through the study is shown in Figure 17.1. Although 260 children were referred to the project, parental consent was not obtained for 65. Of the remaining 195 who were assessed at T1, a further 34 were excluded (26 did not meet eligibility criteria; 6 refused to participate, and 2 left the area). A series of analyses of variance failed to identify any significant differences between the four modes and the control group for chronological age, WASI and all pre-intervention language measures (all p-values > 0.076).

Based on the research plan, each child in the treatment group could have received a maximum of 45 sessions. The median number of sessions achieved was 39 (range 13 – 45), with 63% of children attending 40 or more sessions. Children in the control group were seen by their local community SLP services, uninfluenced by the research team. They received varied amounts of intervention but between T1 and T2 many had little or no contact with therapy services. The median number of contacts of unknown length with local SLPs and

SLP assistants per child in the control group was <1 (range 0 - 59), although their schools and parents may also have received advice from an SLP.

At T3, follow-up was possible for 152 children. Thirty-six children (5 Control; 10 Direct Individual; 9 Direct Group; 9 Indirect Individual and 3 Indirect Group) had not received any community therapy during the 9-month period between T2 and T3. One child had entered a unit attached to a mainstream school offering services to children with severe language difficulties and received 115 therapy sessions. The remaining 115 children received a median of 4 contacts (range 1-26) in their community settings. These data highlight the fact that many more sessions were offered to the children receiving research intervention during the T1-T2 RCT period than were offered to any child in the community setting.

At T1, 75 (46.3%) of the overall sample were children who were identified as having a predominant expressive language impairment (E-LI), defined as an expressive language standard score below the 10th percentile on the CELF-3^{UK} and a composite receptive language score (an equally-weighted composite of the CELF-3^{UK} and the BPVS-II scores at T1) above the 10th percentile. The remaining 86 (53.7%) were identified as having a mixed receptive-expressive impairment (RE-LI) with all scores <10th percentile.

Results for research children were analyzed using 2 x 2 analyses of covariance (ANCOVAs) with T2 scores as the dependent variable and the corresponding T1 score as a covariate, and also with the T3 score as dependent variable and the corresponding T2 score as a covariate. We carried out these analyses using AMOS 6.0 structural equation modelling (SEM) software (Arbuckle, 2005). Conventional ANCOVAs assume that covariates are measured without error but the SEM approach allowed us to control for measurement error in the test scores used as covariates and also to test both direct and indirect effects of intervention. The analyses revealed good levels of fit to the models tested (Boyle et al., 2007, pp. 28-36) and showed no significant differences between direct and indirect therapy or

between individual and group therapy on CELF-3^{UK} Receptive or Expressive scores at either T2 (all F-values <1, all p-values > 0.392) or T3 (all F-values < 2.46, all p-values > 0.119). Although some children made sizeable shifts in their adjusted scores at T2 and T3, these were not systematically associated with being in any model of intervention. Similarly, Bonferroni-adjusted planned comparisons between the four modes of research intervention using one-way ANCOVAs failed to reach statistical significance (all adjusted p-values > .05), suggesting that all four models of intervention provided efficacious therapy. However, children with E-LI had an average treatment effect of some 4.89 standard score points more than those with RE-LI.

Since there were no significant differences among delivery models, all children who received research intervention were compared as a cohort with children in the control group. This showed a significant advantage of the research intervention at T2 ($p = 0.031$) for expressive language with the mean adjusted scores at T2 on the CELF-3^{UK} Expressive scale 2.72 standard score points (95% CI [+0.24, 5.20]) higher than the corresponding adjusted mean scores for the control group. This is unlikely to be due to measurement error as it exceeds the 95% confidence interval for the standard error of measurement for the CELF-3^{UK} Expressive scale based upon internal consistency reliability. There was no significant direct statistical effect of research intervention upon scores for expressive language at T3, but a significant indirect statistical effect ($p = 0.044$), equivalent to an adjusted mean score advantage of +1.32 (95% CI [+0.09, 2.60]) for those receiving research therapy. This suggests that children receiving research intervention remained a little ahead of control group children at T3, as they had been at T2, but that they had not continued to make accelerated progress.

There were no significant effects of research intervention upon receptive language scores at either T2 ($p = .950$) or T3 ($p = .515$) although children with higher receptive

language scores at T1 made greater progress in expressive language at T2 ($p = 0.007$), though not at T3 ($p = 0.085$). Non-verbal IQ at T1 was not a significant predictor of language outcomes at T2 or T3. The results suggest that the intervention led to short-term gains on expressive, but not receptive, language measures, and that this was achieved in all intervention models.

Conventional 2 x 2 ANCOVAs comparing the main effects of direct versus indirect and individual versus group modes with T2 and T3 scores as dependent variables and corresponding T1 scores as covariates were carried out on the data from a questionnaire survey. The results revealed that parents reported functional gains at T2 in the children's literacy ($F_{1,42} = 4.12$, $p = .049$, partial eta-square = .089) and behavior ($F_{1,40} = 4.075$, $p = .05$, partial eta-square = .092), although these reported benefits were not sustained at T3 (all F-values < 1.001 , all p-values $> .325$). However, the low response rate of 45% at both T2 and T3 should be noted (Boyle et al., 2007); this precluded the use of AMOS 6.0.

An economic evaluation within the trial showed that indirect intervention via SLP assistants was the least costly option, particularly indirect group intervention. In the light of the non-significant differences in outcome amongst delivery models, indirect group intervention emerged as potentially a good use of resources. However, the greatest change in CELF 3^{UK} scores using the least overall resources was through direct SLP delivery to children in groups (Dickson et al., 2009).

OVERVIEW OF ASSESSMENT AND DECISION-MAKING

Eligibility for and duration of therapy were determined by the trial protocol. SLPs decided upon language targets and advancement through treatment for each child, with T1 language assessments inspected to determine areas of language difficulty. Because the study was concerned with comparing language intervention delivery models, not building a new therapy, considerable freedom was given to SLPs to choose appropriate language targets for

children, as would happen in UK SLP services. However, broad decision-making guidelines were written into the LTM. Any CELF sub-test score at 6 or below suggested eligibility for intervention in the related language area. SLPs also based eligibility for grammar intervention on a syntactic error analysis (Crystal, Fletcher, & Garman, 1976, p. 78) of the children's spontaneous speech from the recorded oral recount, and from general conversation.

Eligibility for narrative intervention was based on the SLP's episode analysis of the recorded oral recount with no standardized measures used. In addition, the CELF-3^{UK} rapid automatic naming sub-test and CELF-3^{UK} item analyses were available, and note was taken of any pre-existing IEPs and/or previous therapy targets.

Where a child had more than one eligible intervention area (as was common), the intervention sequence suggested was:

1. *Comprehension Monitoring*: this was considered to be a fundamental coping strategy, important for classroom success, and so would be the first area of therapy tackled for the majority of children.
2. *Vocabulary Development*: this was also considered to be a fundamental language area as all children require strategies for learning and retrieving new words throughout the primary (elementary) school years. Vocabulary development was begun just after comprehension monitoring.
3. *Grammar*: this was considered to be a priority where children showed marked spoken grammar errors that served to make a child sound immature, and could draw negative attention. Grammar intervention was introduced in parallel with or instead of vocabulary development.
4. *Oral Narrative*: narrative depends upon use of relevant vocabulary and grammatical markers, and narrative was tackled if grammar and word-knowledge were sufficiently well developed.

Figure 17.2 outlines helpful steps for beginning SLIP with a child.

Insert Figure 17.2 about here.

However, intervention targets can be set in different language areas at the same time, and individual sessions may contain activities relating to several targets, and plans were made by the SLP to suit their perceptions of child need. The manual was indicative but not prescriptive about intervention sequence, and it was recognized that factors other than language skills could influence decisions. For example, child factors such as concentration and motivation; external factors such as existing therapy targets, parent or school priorities, and individual SLP preferences might be relevant. For children who were randomly allocated to group interventions, common therapy aims might be sought, which also affected intervention areas and language goals. Detailed goal setting was therefore not pre-determined by the manual; rather, goals were decided upon by each child's SLP at the start of the intervention period, and reviewed as progress was made. Language-learning activities were selected to cope with such variation. The LTM contained probes used to measure progress and inform decisions about continuing with existing targets or moving to new targets. Probes checked five unaided attempts at comprehension and/or expression of language targets, with success noted.

PRACTICAL REQUIREMENTS (Dickson et al., 2009; McCartney et al., 2005)

Time And Personnel Demands

Intervention took place within a child's school, with some children transported to group intervention in a different school. They travelled by escorted taxi services run by firms approved by and under contract to their education authority, paid for by the research project. Groups comprised two to five children. The maximum number of children (including grouped children) for whom intervention was delivered at any one time by an SLP/SLP

assistant was nine, except for a short overlap between intervention periods when it rose to eleven for some staff. SLPs planned therapy for up to 19 children at one time, including children seen by themselves and by their paired SLP assistant.

Training

SLP assistants had previous experience of working with children and undertook in-service training provided by the research team, and a recognized two-day training course for SLP assistants (ELKLAN, 2005). The SLP assistants also observed community SLP assistants at work. The research SLPs received no additional training.

Liaison

At the start of intervention SLPs had around 1.5 days per week available to liaise with their SLP assistants and to plan both their own and their SLP assistants' caseloads. Later, when working with more experienced SLP assistants, SLPs had 0.5-1.0 day per week for planning. All SLPs agreed that this time had been adequate. They used planning time with their SLP assistant to set, list and prioritize therapy targets for children; to suggest activities for each target from the manual, and to discuss whether a target had been met. All SLPs also found time to plan their own therapy, and to liaise with parents and teachers. As SLP assistants became more confident and experienced, the planning time per child target was reduced and SLP assistants made more suggestions and needed fewer detailed explanations. There was no training for teachers or families, but written suggestions and reports were provided.

Sessions and Dosage

There was no significant difference between the number of sessions delivered by an SLP and an SLP assistant. The number, length and frequency of sessions were prescribed by the research protocol. Forty-five 30-40 minute sessions were offered and the mean number attended per child was 38, median 39. Based on an averaged session length of 35 minutes, the child average was over 22 hours of therapy. The number of episodes per session varied and it

is not possible to calculate cumulative intervention intensity. It is likely that this would vary with the activity chosen, and also according to whether a child was treated in an individual or group format.

Resource Use and Costs

A within-trial economic evaluation was performed as part of the RCT and involved the estimation of salary and travel costs associated with each model of intervention delivery. Because SLPs and SLP assistant salaries were available from the Scottish NHS, standard salary costs could be applied to the time therapists and assistants logged for preparing and delivering sessions, as well as their travel time between intervention locations. Travel costs for children attending group therapy in another school were calculated using city licensed-taxi tariffs applied to the cost of a return journey from their own school to the nearest therapy-location for each session attended. Transportation costs for SLPs and assistants were based on the estimated return journey distance from the relevant city center to therapy locations. A comparable method for estimating the costs of providing services in the community was applied to children allocated to the control group. The lowest cost per research intervention child was indirect (SLP assistant) group intervention, but as noted above, the greatest change in the primary outcome measure (CELF-3^{UK} Total Score) obtained using the least amount of resources was direct (SLP) group intervention.

Compliance with the manual

SLPs decided on the language targets to be set across the 15-week period, and how these were to be addressed within individual sessions. A post-intervention case note analysis determined which language areas were covered. Of the 124 research-intervention children, 5% undertook two language areas, 55% three and 40% all four. Complete session data was available for 119 children, totaling 4538 sessions. This was inspected to identify which

language areas were addressed in each session and is summarized in Table 17.3. Sessions could include activities from several language areas, and so do not total 100%. Session data was further analyzed to show how many sessions contained activities not included in the LTM. Fourteen-percent contained some activities classified as addressing general language learning strategies, and another 5% contained some ‘other’ activities not specified in the LTM. These figures, particularly the low number of ‘other’ activities, show high compliance with the manual.

Insert Table 17.3 about here.

KEY COMPONENTS

In line with principles for manualization (Carroll, 1997), the LTM considered the planned frequency and duration of sessions (*structural aspects*), what intervention was expected to occur (*boundaries of treatment*); the unique features through which change was expected to occur (*active ingredients*), and the goals of therapy and the processes used to reach them (*therapy procedures*).

Structural Aspects

The frequency and duration of sessions was decided by reference to the literature before the trial began. The total amount of input was based upon a meta-analysis (Law et al., 1998), in which the median duration of interventions from RCT and quasi-experimental studies was some 20 hours of therapist time, and was associated with an overall effect size of +0.97 for expressive language. Three sessions per week were offered following a controlled study of indirect language intervention with small groups of children, which suggested that three sessions per week led to more effective outcomes than two sessions (Boyle, 2012). The research intervention therefore offered forty-five 30-40 minute sessions, three per week over a 15-week period, delivering some 22-30 hours of therapy per child.

Boundaries of Treatment

The focus of each session was language therapy, which could be delivered by SLPs or SLP assistants under direction. Only children with problems known to be successfully treated with SLIP methods were included in the study. The language therapy adopted evidence-based language-learning activities from existing therapy practice.

Active Ingredients

Active ingredients were determined by the research team using brainstorming techniques and discussing their understandings of the therapeutic process in relation to theories of language change and the elements considered necessary for therapy to have its intended effects. These stressed that therapy activities should take place in a facilitating environment, with respect for the child and a communication context adapted to meet their needs. This aspect of intervention is variously described in the SLP literature as the philosophy level of therapy (Bray, Ross, & Todd, 1999); as empathy (Williamson, 2001), and as an aspect of emotional literacy (Williamson, 2003). They considered that intervention should develop children's ability to reflect on language, should provide them with information on appropriate language formulations and repeated exemplification and practice of targeted forms in a motivating context, and should encourage the child to take responsibility for change. Activities that took account of these powerful factors would involve the formation of a strong therapeutic alliance between the SLP/SLP assistant and child, focused on the alleviation of communication problems. These active ingredients were developed into their seven “golden rules for therapy” (LTM, pp. 6-12): *explain; make it fun; correct ‘mistakes’ systematically; make activities easier or harder; be prepared to change the activity; help the child to understand; and use talk and question forms that get the desired response*. These principles were adopted by all of the SLPs and SLP assistants who participated as therapy providers.

Advice on creating a communication friendly environment in the classroom was prepared for teachers, adapting and extending Scottish government guidance, supplemented with a list of helpful suggestions and specific ideas to meet the needs of individual project children (LTM, pp. 16-22).

Therapy Procedures

As stated, the literature search of evidenced therapy studies comparing outcomes with controls for children similar to those entering the project (McCartney et al., 2004) had determined that language intervention would take place in the areas of *comprehension monitoring, vocabulary, grammar and oral narrative*, and relevant interventions had been found. There was a need to collate language-learning activities within these areas, using readily available classroom resources as well as copyright-free materials from specialist language therapy publishers. The research SLPs listed and adapted games and activities commonly used in UK therapy for each of the intervention areas, and cross-referenced them to published therapy resources and materials where possible. They wrote explanations of intervention activities in a way that non-specialists such as assistants could understand, and constructed probes to check if children had achieved specific language targets. These are available in the LTM constructed for the project (McCartney, 2007). Examples of specific games and activities also appear in the case study of Lewis, within this chapter.

An audit of therapy plans six weeks after the start of intervention for the first 30 children to receive direct (SLP) intervention found that project SLPs had been able to identify relevant intervention areas and language targets from the LTM for use with individual and grouped children, and had found suitable and enjoyable activities, and that they were able to prepare participants' treatment plans (McCartney 2004). The LTM was therefore used throughout the study.

CONSIDERATIONS FOR CHILDREN FROM CULTURALLY AND LINGUISTICALLY DIVERSE BACKGROUNDS

In the RCT described here, SLIP was efficacious for children with persistent expressive language impairment. It is likely also to be useful for children with less severe problems, or vulnerable children within areas of social deprivation. The teaching of grammar markers, narrative episodes, common English words and personally relevant curriculum vocabulary; the promotion of a communication-friendly environment, and encouragement for children to monitor their own comprehension could all be useful for children learning English as an additional language. The flexibility of the LTM approach means that words relevant to linguistically diverse communities could be taught, and grammar markers appropriate to regional dialects could be incorporated. As with other intervention approaches represented in this book, the effects one might derive from SLIP depend to a large extent on providers' familiarity with and sensitivity to the linguistic and cultural characteristics of the child's speech community.

APPLICATION OF SLIP TO AN INDIVIDUAL CHILD

The experiences and outcomes for one child (referred to as "Lewis") who participated in direct (SLP) group therapy are described. Lewis was referred to his local NHS community SLP service aged 2;08 as "late to talk" and seen by them aged 2;11. At that time, he received a diagnosis of specific language impairment. From school entry he attended a language unit within a mainstream school full time for three and a half years, receiving almost daily specialist SLT and educational support. He then received full-time education in his local school, supported by blocks of therapy from his community SLP service.

Beginning seven months before his participation in the RCT, Lewis had received two-months of weekly therapy sessions with a community SLP. These had focused on word-finding skills, phonological processing (rhyme identification), and understanding and using

personal pronouns. He was reported to be enthusiastic in therapy sessions, but poorer at listening and attending in class. Just before beginning research therapy, a progress report from his community SLP stated he had recently completed another block of individual therapy delivered within his school in which word-finding skills, phonological awareness and expressive grammar were emphasized. He was reported to have progressed in these areas by learning to describe words he could not retrieve, to identify and produce rhyming words, and to use and write pronouns and auxiliary verbs.

Research intervention

At age 8;11 (T1) Lewis was randomly allocated to direct (SLP) group intervention with three other children of similar age. At T1 his SLP set therapy targets for the first half of the fifteen-week intervention period based on language assessments and reports of previous therapy, then further targets for the second half of intervention based on progress. Decisions about moving to a new target were based partly on Lewis' responses to LTM probes that required him to produce his current language targets without additional cues, with the number of correct responses noted. If he was successful, defined as correct four times out of the five probes, he moved to a new target. All language-learning activities and probes were from the LTM. Therapy notes were completed at the end of each session.

Forty-five group sessions were scheduled, but school holidays and absences meant that Lewis completed 34 sessions. This was within one standard deviation of the research cohort mean of 38 sessions.

Lewis's targets and sample activities from the LTM appear in Table 17.4. As the table shows, he undertook intervention in three language areas (comprehension monitoring, vocabulary development and grammar markers) with successful probes in all areas.

Insert Table 17.4 about here.

A summary of his progress through intervention also appears in Table 17.5.

Insert Table 17.5 about here.

Outcomes

As shown in Table 17.5, Lewis showed an increase of 6 standard score points in the CELF-3^{UK} Receptive scale between T1 and T2, at the 70th percentile for the level of score change in the cohort as a whole, and an increase of 10 standard score points in the CELF-3^{UK} Expressive Language scale scores over the same time period, at the 85th percentile. Lewis's CELF-3^{UK} Receptive Language and Total Language Scores continued to show improvement between T2 and T3, but his CELF-3^{UK} Expressive Language Scores and BPVS-II standard scores levelled off or decreased, although his T3 scores remain above those at T1. This aspect of Lewis's profile is in line with results for the overall cohort.

Qualitative Evaluations

At T1 and T2, Lewis's parents and teacher completed the listening and speaking sections of the CELF-3^{UK} Parent/Teacher Rating Scales (Semel et al., 1996), which record how frequently difficulties in listening and speaking occur at home and in school. His teacher, but not his parents, also returned a completed question at T3. Responses on a four-point scale (*never, sometimes, often or always a problem*) were assigned a numerical value from 1 (*never*) to 4 (*always a problem*) and averaged, with a lower average suggesting fewer difficulties. Lewis's parents also returned project-specific questionnaires at T1, T2 and T3, reporting on progress on 31 aspects of understanding, spoken language, use of language, literacy and general behavior over the previous three-month period, scaled as *no, a little, satisfactory, good* and *very good* progress and their views of the number of communication aspects showing "good" or "very good" progress at each time point are also shown in Table 17.5.

At T2 Lewis's parents and teacher also completed questionnaires evaluating the quality of the research intervention. His parents reported that they had been kept up to date,

that therapy concentrated on areas where Lewis needed help and he had enjoyed therapy, that they were pleased with the amount provided, and that they had been given ideas to help at home. Lewis's teacher similarly reported that she had received good information and ideas that were helpful in school, that she had been able also to provide the research SLP with useful areas for Lewis to work on, and that Lewis had enjoyed therapy and had gained confidence.

These quantitative and qualitative outcomes suggest that, as with other children, Lewis had made language progress, and that his parents and teacher had noticed a lessening of functional difficulties in listening and speaking over the intervention period.

FUTURE DIRECTIONS

The SLIP intervention has been shown to be efficacious for children with expressive language impairment over the short-term in a planned RCT, the design that provides “best evidence” in support of an intervention. As has been reported in other similar studies (e.g., Fey et al., 1997), the children did not continue to make accelerated progress in the follow-up period after research therapy was ended. During that period, project children received small amounts of contact with SLPs in their communities, in line with that received by control-group children between T1 and T2. Continuing the intervention over longer time periods and evaluating its efficacy in further RCT studies is required. Further, the intervention has never been subjected to an effectiveness trial, where implementation in real-life contexts is evaluated, and this is needed.

The same intervention protocol and activities from the LTM were used in a cohort study with no control group (McCartney et al., 2011) with delivery of language-learning activities by school staff (teachers, learning support teachers, and classroom support workers), not SLPs or SLP assistants. This reflects a widespread indirect “consultancy” model used by UK SLPs, where they provide advice and suggest activities to school staff,

who implement suggestions. In the cohort study, children were required to meet the same eligibility criteria as in the RCT, and a research SLP set language targets based on discussion with the child's teacher and using the procedures outlined above for the RCT. The project supplied materials, and activities were again from the LTM. This allowed historical controls to be used, based on the RCT outcomes. However, in the cohort study the positive results of the RCT were not replicated. This was perhaps related to the fact that children in the cohort study were shown to have received less intervention than RCT project children. This highlights one of the problems of research designed to translate findings from RCTs to real-life settings: the difficulty of securing relatively large amounts of intervention within available resources. The need to determine minimum "dosages," and to further consider implementation factors is clearly needed. An evaluation study (McCartney et al., 2010) reports further on teachers' views and presents a Language Support Model for Teachers to facilitate the introduction of SLIP into classrooms with indirect delivery via school staff: see suggested readings.

At present, SLIP provides one of the few evidence-based interventions for elementary school children with LI that has been used to evaluate systematically the effects of provider and group versus individual therapy, and has been shown to be efficacious in improving expressive language over the short term. Further investigations of ways to build on this progress in real-life contexts, with other language-impaired populations, broader age-groups and different dosages and scheduling possibilities are needed.

Turning to models of service delivery more generally, as Nelson (2010) notes, a key underlying principle of speech and language intervention is determining the "best mix of services" as well as the "best delivery model." To achieve this, there is a need for more research on service delivery models, moving from efficacy studies to effectiveness studies where both the clinical and statistical significance of outcomes can be evaluated in real-life

contexts. For example, in the case of pre-school children, there is a need for effectiveness studies of consultancy and of models of indirect service delivery in which parents and early educators serve as service providers. In the case of school-aged pupils, further controlled studies of the effects of individual versus group formats and setting (e.g. classroom versus pull-out) across a broad range of presenting problems would be illuminating, but determining effective dosage is a priority. And in the case of older students, including those in high school, further research into encouraging engagement and ownership of intervention is also required. Research extending large-scale RCTs across a broader range of presenting speech language problems together with investigations of the use of telepractice and computer programs, particularly tablet applications are also needed. The challenge for SLPs in all such endeavors is to evaluate not only the effects of the intervention they provide but also the frameworks in which they are delivered.

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Learning Activities

1. Read Zeng et al. (2012). How important is it to consider “spacing” effects, or distributed learning when accounting for “dosage” of intervention?
2. How might future studies evaluating models of service delivery be designed to take better account of cultural and linguistic diversity?
3. Review the ASHA Evidence Maps (<http://ncepmaps.org/>). Have any recent developments in evidence-based practice guidelines for service delivery been reported? What are the implications?
4. Try some activities from the Language Therapy Manual (LTM) (McCartney, 2007) to further consider some of language-learning approaches outlined in this chapter. You can access the Language Therapy Manual from the University of Strathclyde archive by searching on the home page or via:

http://www.strath.ac.uk/humanities/schoolofpsychologicalscienceshealth/slt/lt_manual/

Semantics activity – ‘word web’: the video shows a ‘word web’ or ‘word features map’ (LTM pp.60-61, and illustration p. 21). These work best for students learning nouns.

Make a web, select five nouns a child might learn, and decide which semantic (word meaning) and phonological (word sound) features could be useful. Write questions you could ask, or perhaps that the child could ask themselves. Try it with some words that are not nouns.

Semantic activity – ‘clues’ games: Lewis found it easier to give clues in response to other children to help them guess a word than to ask questions that elicited useful information himself. Read the six ‘clues games’ (LTM pp. 68 – 69). Use the words from the ‘word web’ task to think of useful cues, then try ‘Clues Game 3’. What two clues would be best for each word, and why? Do this again with related words, such as ‘drinks’. Think how you would explain ‘best clue questions’ to Lewis.

Episode activity – ‘pairs’ game: read the information on ‘pairs’ games (LTM, p. 13). It is easiest to do this with two people, one representing the child, the other the SLP. Make two picture cards for each word from the ‘word web’ task, or write them on cards (faster!) if both people can read. Play the game taking turns to look for a pair, with each card named by the person (‘SLP’ or ‘child’) who turns it over. Note the start and end times, using a clock/watch or stopwatch, and how many times a card is named by the ‘child’. Repeat, with the card named by the ‘child’ each time irrespective of who turns it over. Again note the start and end time, and the number of times the ‘child’ names a card. Repeat for a third time, with the ‘child’ naming cards but only when a pair is found. Again, note the start and end time, and the number of chances to name. Work out which version allows more chances for the ‘child’ to name a card. Such minor variations can affect cumulative intensity of intervention.

KEY WORDS

Direct therapy	Therapy delivered to a child by an SLP
E-LI	Expressive language impairment
Indirect therapy	Therapy planned by an SLP, but delivered by another – e.g. teacher, assistant or parent
R-ELI	Mixed receptive-expressive language impairment
SLIP	The Strathclyde Language Intervention Program

Table 17.1

‘Levels of Evidence’: the Scottish Intercollegiate Guidelines Network Grading System

(SIGN, 1999)

Level	Description	References
Ia	Meta-analysis of > 1 randomized controlled trial	Law, Garrett, & Nye (2003); Cirrin, Schooling, Nelson, Diehl, Flynn, Atakowski, Torrey & Adamczyk (2010); Schooling, Venediktov & Leech (2010); Zeng, Law & Lindsay (2012)
Ib	Randomized controlled study	Law et al. (1999); Boyle, McCartney, Forbes, & O'Hare (2007); Broomfield and Dodd (2011); Allen (2013); Grogan-Johnson, Schmidt, Schenker, Alvares, Rowan & Taylor (2013)
IIa	Controlled study without randomization	Eiserman et al. (1990); Gibbard (1994) (Study 2); Wilcox, Kouri, & Caswell (1991); Bland and Prelock (1995); Throneburg et al. (2000); McCartney et al. 2011.
IIb	Quasi-experimental study	--
III	Nonexperimental studies, i.e., correlational and case studies	--
IV	Expert committee report, consensus conference, clinical experience of respected authorities	--

Table 17.2

**Effectiveness of Parameters of Service Delivery for Children with Developmental
Speech & Language Problems: Evidence from 4 Systematic Reviews (2003-12)**

Review	Details	Dosage	Format	Setting	Provider
Law, Garrett, & Nye (2003)	Review of 25 studies that addresses the effects of dosage (here, duration of treatment) and the effectiveness of direct versus indirect service delivery, setting and individual versus group approaches for outcomes in expressive and receptive phonology (N=15), vocabulary (N=5) or syntax (N=17) in children with primary speech and language difficulties (1-15 years).	√	√	√	√
Cirrin, Schooling, Nelson, Diehl, Flynn, Atakowski, Torrey & Adamczyk (2010)	Review of 5 studies that addresses the effectiveness of service delivery models (pull-out, classroom-based and consultative) on outcomes for vocabulary (N=3), functional communication (N=1), language and literacy (N=3) targeting elementary school-age children (5-11 years)		√	√	√
Schooling, Venediktov & Leech (2010)	Review of 17 studies which addresses the effects of dosage (N=10) and the effectiveness of direct versus indirect service delivery (N=4), setting (N=9) and individual versus group approaches (N=6) on intervention for pre-school children < 6 years	√	√	√	√
Zeng, Law & Lindsay (2012)	Review of 20 RCTs identified via systematic review ((Law et al., 1998; Law et al., 2003; Law et al., forthcoming) reporting outcomes of interventions targeting phonology interventions (N=9), syntax (N=10) and vocabulary (N=7) for children (no details of age provided in the review paper)	√			

Table 17.3

Percentage of Children and Sessions Including Activities in Each Language Area
Adapted from Boyle et al. (2007, p. 19)

Language area	% children undertaking activities in each language area	% sessions including activities in each language area
Comprehension monitoring	97	12
Vocabulary development	100	59
Grammar	92	33
Narrative	46	11

Table 17.4

Lewis's Targets and Sample Activities from the Language Therapy Manual (LTM)

Session number *	Lewis's Language Targets	Sample of Activities from the LTM
1	<u>Comprehension Monitoring</u> - to gain knowledge of the skills necessary for good listening within a group situation.	<p>Sample activities: LTM p. 50. Discussion and activities. Discuss what to do to be a good listener. Brainstorm, hearing the children's ideas followed by discussion. Try to elicit the following points from the children: 'We need to do good sitting'; 'We need to do good looking'; 'We need to stop talking'; 'We need to do good listening'. As each idea is discussed show an appropriate picture prompt card and model 'good' and 'bad' examples of each of the rules. These become the 'group rules' to be followed throughout all sessions.</p> <p>Role-play Each child is given a picture prompt card showing an example of 'good' or 'bad' listening. Each in turn role-plays what is shown on the card, while the others decide what they are trying to demonstrate. Once all the examples have been discussed, put 'good' prompt pictures on the wall as a chart to remind the children of the 'rules'.</p>
2	- to become aware of reasons for communication breakdown, and how these can be resolved. Successful Probe Session 3	<p>Sample activities: LTM p. 52. Discussion and activities. Explain 'too hard' words and 'too long' sentences. Tell the children that a person might use a word we do not know, or use a really long sentence. Demonstrate this, saying: 'If I asked you to draw me a picture of a 'herbivore', would you be able to do it? Or what if I asked you to tell me what an 'ophthalmologist' does? Those might be words you don't know, so you might not be able to do what I asked. And if I said: 'Can you tell the teacher in room six that you won't be in tomorrow after two o'clock because your mum says you have to go to your gran's house after the language group?' That was a really long message that was hard to remember. Long messages can be hard to understand because there is so much to remember.' Explain that you are going to play some games to practise spotting messages that are too long, and messages with hard words.</p> <p>Pass the Whisper To demonstrate what happens if too long a message is given, write down a 'too long' message then whisper it to one child so the others cannot hear. The child whispers it to their neighbor, and so on round the group. Write down the original and final versions and compare, to show that people might forget parts or get muddled up. For example, try: 'Last night at ten past seven me, my mum and my brother David went to the shops to buy four cans of coke and strawberry ice-lollies to eat in the park.'; 'Tomorrow I want to walk from my house to my auntie Betty's house so that I can take her dog Alfred for a walk.'</p> <p>Simon Says Ask children to do what you say, using a mix of 'easy' and 'hard' sentences. Children are to practise spotting the messages that are too long or have hard words in them, and indicate that. It is not necessary at this stage for children to seek repetition or clarification, just to indicate communication breakdown. Examples of 'easy' and 'hard' sentences would be: 'Touch your nose' versus 'Touch your scapula.', 'Touch your ears.' versus 'Touch your cranium.', 'Touch your tongue.' versus 'Touch your femur.', 'Touch your right knee.' versus 'Touch your tibia.', 'Clap your hands.' versus 'Clap your hands and before you clap your hands hop three times on your left foot'</p>

		<i>and turn round twice’.</i>
3 - 8, 16, 27, 29, 38	<u>Vocabulary Development</u> - to increase word knowledge, vocabulary and word-finding abilities through increased understanding of semantic features.	<p>Sample activities: LTM p. 68-70. Discussion and activities. When working on vocabulary development activities and using cueing it is important to discuss with the child why you are doing it. For example, you can ask a child struggling to access a word ‘<i>What do you need to ask yourself, to help you remember the word?</i>’ The aim is that children will learn to ask these questions of themselves. The children can brainstorm, ‘<i>What do I know about this word?</i>’ to learn questions to ask. Self-prompts can be semantic, for example: ‘<i>What do I do with it?</i>’ or phonological, for example: ‘<i>What sound does it start with?</i>’ The child can be encouraged to think of the question prompts themselves. A ‘word-web’ with these prompts appears in the LTM pp. 21-22 and 60-63.</p> <p>Clues Game 3 In clues games, one child has a picture and gives useful clues about what it represents to others who cannot see it, and the other children guesses what it is. The aim is for the speaker to select the most relevant features, so that the listener guesses successfully after as few clues as possible. For example, to guess the word ‘cow’, relevant clues would be ‘<i>It’s an animal that gives us milk</i>’ as opposed to ‘<i>It lives on the farm</i>’, or ‘<i>It’s big and black and white</i>’. As children often find it fun to make it hard for another child to guess by <i>not</i> giving the most relevant clues, it does need to be stressed that this variant of the game is won by the person who gives fewest clues resulting in a successful guess. Keep a record of the number of clues each child gives before a successful guess to see who gave fewest, at the end.</p> <p>Clues Game 6 Place a set of pictures on the table. One child silently chooses a picture without the others knowing. The child describes the two most relevant characteristics of the item he or she has chosen. The first child to put up their hand can guess the word. This game can be made harder by putting out a set of related pictures, for example ‘drinks’.</p>
3 - 6	- to understand and use conceptual/relational terms, ‘all’, ‘all but one’; ‘none’ and ‘some’. Successful Probe Session 5	<p>Sample activities: LTM p. 91-92. Discussion and activities. <i>All, all but one; none and some</i> refer to quantity in relation to countable objects. Introduce ‘all’ first and then use similar activities to teach contrasts in the order, ‘all/some’; ‘all/some/none’; ‘all/some/all but (except) one’.</p> <p>Coloring The terms can be introduced through coloring activities, where children color ‘all’, ‘some’, ‘none’ ‘all (except) one’ of the spots brown etc.</p> <p>Happy ‘families’ Have six pictures sets of several items, dealt amongst the children. Each child chooses which picture set to collect, for example ‘bananas’ and asks the others in turn ‘<i>Have you got?</i>’. The response is ‘<i>I have some</i>’; ‘<i>I have none</i>’; ‘<i>I have one</i>’ and so on, with the cards passed over as appropriate. The person collecting the cards can then summarise their hand, for example: ‘<i>Now I have some bananas</i>’; ‘<i>I have all but (except) one of the bananas</i>’.</p>
4, 5	to understand and use space/time words ‘before’ and ‘after’. Successful Probe Session 6	<p>Sample activities: LTM p. 100-101. Discussion and activities. ‘Before’ and ‘after’ indicate both time and space sequences, and a spatial illustration is helpful. We can use a visual template labelled ‘before’ (left) and ‘after’ (right) with an arrow pointing left to reflect ‘before’, then pointing right to signify ‘after’, and explain it. Move from demonstrating meaning, to checking comprehension, to a child’s use of ‘before’ and ‘after’, in order to structure learning. Start with ‘before’, and demonstrate the meaning; comprehension and use of ‘after’ will be worked on when ‘before’ is learned. Mime an action, such as teeth brushing, and say: ‘<i>But before I brushed my teeth I had to do something. I had to put on the toothpaste. After I finish brushing I will have to do something else. I will need to spit</i>’. Use the arrow, pointing left to indicate ‘before’ and right for ‘after’</p>

		<p>and say for example: <i>'If we move the arrow this way it shows us what happened before. For this one, before he brushed his teeth he put on toothpaste'.</i></p> <p>What went before?</p> <p>Use two-item picture sequence or photo sequence cards. Show the first part, saying: <i>'This little boy is having a drink. This is what is happening now. Can you show me what he had to do before he could drink?'</i> Show a pictured choice of pouring a drink and an irrelevant distracter. Reinforce with further picture sequence cards.</p> <p>Real-life actions Think of some real-life actions for each child to practise, for example: <i>'Wash your hands before you go to lunch'.</i> Remember it is easier this way round: saying <i>'Before you go to lunch, wash your hands'</i> means the order in which the two actions are mentioned are reversed from the order in which they are to be carried out. Such uses are harder to remember and understand, and are introduced later.</p>
7 - 14	<p>-to understand and use selected antonyms and synonyms.</p> <p>Successful Probe Session 15</p>	<p>Sample activities: LTM p. 100-101, 110. Discussion and activities.</p> <p>Synonyms are words that sound different but have the same, or nearly the same, meaning. For example: 'sofa/couch/settee'; 'spire/steeple'. Some words are only synonymous when applied to a particular item, for example: 'mature/ripe' are synonymous when applied to fruit, but only 'mature' can be applied to people. Teaching synonyms expands the semantic links and semantic information associated with each synonymous word. Some words can be paired with others that have (nearly) the opposite meaning, called antonyms. For example, 'hot' is an antonym of 'cold' and vice versa. Several types of antonymy have been identified that take account of different relationships amongst concepts, as it can be misleading to define antonymy simply as 'oppositeness of meaning'. In the above example, although 'hot' and 'cold' are opposites, the concepts are relative as an item could be 'warm', whereas the concepts 'dead' and 'alive' are mutually exclusive. If a concept has an opposite then typically the word pair is taught together, with the word describing 'the most' of something introduced first – the antonym then means 'not' the concept. It is not necessary for a child to use the terms synonym and antonym: concentrate on (nearly) the 'same' and 'opposite' meanings.</p> <p>Maths vocabulary</p> <p>Maths vocabulary uses many synonyms and antonyms, often with particular mathematical meanings. Use simple language to introduce new maths words. For example, for 'subtract', often taught after 'add', start by using 'take away' or 'count back' to familiarise the child with the meaning. Once this is understood, introduce 'subtract' and 'minus' as different words with nearly the same meaning (synonyms). The child should first hear the maths word in discussion and see it alongside its symbolic and/or written form. Where possible use concrete objects, such as blocks. Allow the child to manipulate the objects as required by the word: for example, have five blocks and physically take two away.</p>
9, 10, 13	<p><u>Grammar</u></p> <p>- to understand and use regular past '-ed' tenses.</p> <p>Successful Probe Session 15</p>	<p>Sample activities: LTM p. 129-30. Discussion and activities.</p> <p>Explain to the children that when we talk about things that have 'finished', we have to change the way we say the action word, for example: <i>'She walked to school'; 'James jumped really high.'</i> and that lots of action words use this ending. The sound of this grammar marker varies slightly with the word it is attached to, but this need not be stressed.</p> <p>What they did</p> <p>Enact short sequences with miniature figures, for example making one figure 'look' at something, another 'walk' somewhere like school. Talk about what the figures are doing, saying for example: <i>'This girl is looking at a book.'</i> Then ask <i>'What did she do?'</i> to elicit the past tense from the children, who should say <i>'She looked at a book'.</i> If a child cannot answer a question the adult should model the answer.</p> <p>Toy stories</p>

		<p>This is similar to 'What they did', but at a harder level. Miniature figures and objects are used. The adult relates a short sequence of events, acting it out with the miniature toys, using verbs in the present tense. The events are then re-told by the adult, pointing to the figures but speaking in the past tense. Since the figures do not carry out actions during the repetition, children are helped to realise that the events have already taken place. A child is then asked to tell the events to another child. The adult can prompt with 'And then...'. If a child is struggling, the adult models the story again in the past tense. An example of a story is: 'This little girl looked at her book, then played with her brother, then they both kicked a ball, and they laughed. She looked at the clock and they both walked to the couch to watch TV.' The story could be made easier or harder. A child might need to enact the story several times with the toys before trying to verbalise it. Picture cards showing an event sequence could alternatively be used.</p>
18 – 26, 28	<p>- to understand and use comparative and superlative word endings.</p> <p>Successful Probe Session 30</p>	<p>Sample activities: LTM p.92-93. Discussion and activities.</p> <p>Comparatives and superlatives relate things to each other. Comparatives compare two things along some dimension, for example: 'bigger', 'longer', 'faster', 'younger'. Superlatives identify which has most of the dimension under discussion, for example: 'biggest', 'longest', 'fastest', 'youngest'. The underlying dimension being compared should be targeted first to ensure comprehension, for example check the child can identify 'big' and 'small' before moving to 'bigger' and 'biggest', 'smaller' and 'smallest'. This should be done by classifying 'big/small' objects, and could begin with the adult modelling for the child by labelling each as 'big/small' as appropriate. This can be repeated with pictures if necessary. If the child requires to work on a number of comparatives/superlatives, it is best to start with qualities that can be represented visually first, such as size, 'big/small', or length, 'long/short', rather than qualities such as 'slow/fast'.</p> <p>Objects, pictures and stories</p> <p>If possible, comparative and superlative terms should be introduced with objects, for example balloons, blown up to different sizes. The adult should begin by modelling, for example adapting stories like Goldilocks so that three terms can be used in relation to each other: 'big', 'bigger', 'biggest'; 'hot', 'hotter', 'hottest'; 'soft', 'softer', 'softest'.</p> <p>Opposites</p> <p>It is possible to work on opposite meanings at the same time, for example, saying 'This one is the biggest, can you find me the smallest?' Discretion has to be used, as some children may find this confusing.</p>
34, 36	<p>- to understand and use common irregular plurals.</p> <p>Successful Probe Session 37</p>	<p>Sample activities: LTM p. 134. Discussion and activities.</p> <p>Regular plurals should be used first. Remind the children that when we have more than one of something, we usually use a special /s/ ending on the word, for example 'cats'; 'horses'; 'bags' could be two or more things but not one. The sound of this grammar marker varies a little with the word it is attached to, but this need not be stressed. Explain that some words have different plural endings. Common examples are 'man-men'; woman-women'; 'mouse-mice'; 'foot-feet'. These do not have an added 's' to guide comprehension, and there is no consistent rule.</p> <p>Make the pair</p> <p>Since there is no consistent change signalling irregular plurals, children need to learn common examples one by one. Use pictured examples of 'one' and 'more than one' of the item, and use phonological awareness tasks to indicate which parts of the words are similar (usually the beginning and end consonants) and which are different (the vowel). Have the children match the pairs, and say the singular and plural versions. Teaching irregular plurals in 'families', such as the group where 'oo' vowels become 'ee' vowels ('foot-feet'; 'tooth-teeth'; 'goose geese') can be helpful.</p>
43-45	- to understand and	<p>These final sessions, following four absences, were used to recap Lewis's previous targets: 'all'; 'all but one'; 'before' and 'after';</p>

	use earlier targets	regular past tense; 'closest' and 'farthest' as superlative endings.
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* 45 group sessions took place. Lewis attended 35, and was absent for 10: sessions 17, 22, 25, 31, 32, 33, 39, 40, 41, 42.

Table 17.5

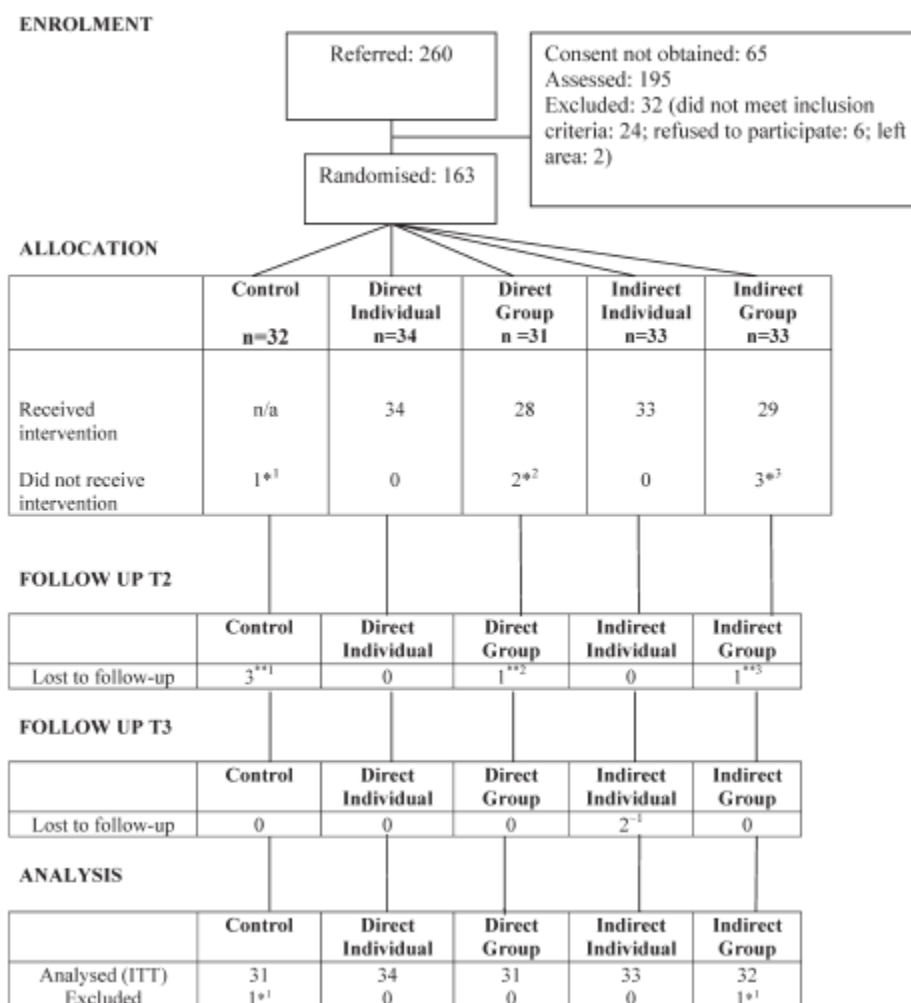
Lewis's Standardized Language Assessment Scores; CELF Parent/Teacher Observation Rating Scales, and Parents' Views of Progress, by Time Point.

Assessment	T1	T2	T3	Change T1-T2	Change T2-T3	Change T1-T3
CELF-3 ^{UK} Receptive Language Score (Standard Score)	79	85	89	+6	+4	+10
CELF-3 ^{UK} Expressive Language Score (Standard Score)	66	76	70	+10	-6	+4
CELF-3 ^{UK} Total Language Score (Standard Score)	64	78	79	+12	+1	+15
BPVS-II (Standard Score)	87	96	93	+9	-3	+6
CELF Teacher Observational Rating Scales – listening*	2.44	2.44	2.44	0	0	0
CELF Teacher Observational Rating Scales – speaking*	2.58	2.16	3.05	-0.42	0.89	0.47
CELF Parent Observational Rating Scales – listening*	2.56	2.11	-	-0.42	-	-
CELF Parent Observational Rating Scales – speaking*	2.89	2.72	-	-0.17	-	-
Parent assessment of progress: Number of areas 'good' or 'very good' progress (T = 31)	6	18	7	12	-11	1

- Four-point scale from 1 (*never a problem*) to 4 (*always a problem*). Lower scores indicate the problem occurs less frequently.

Figure 17.1

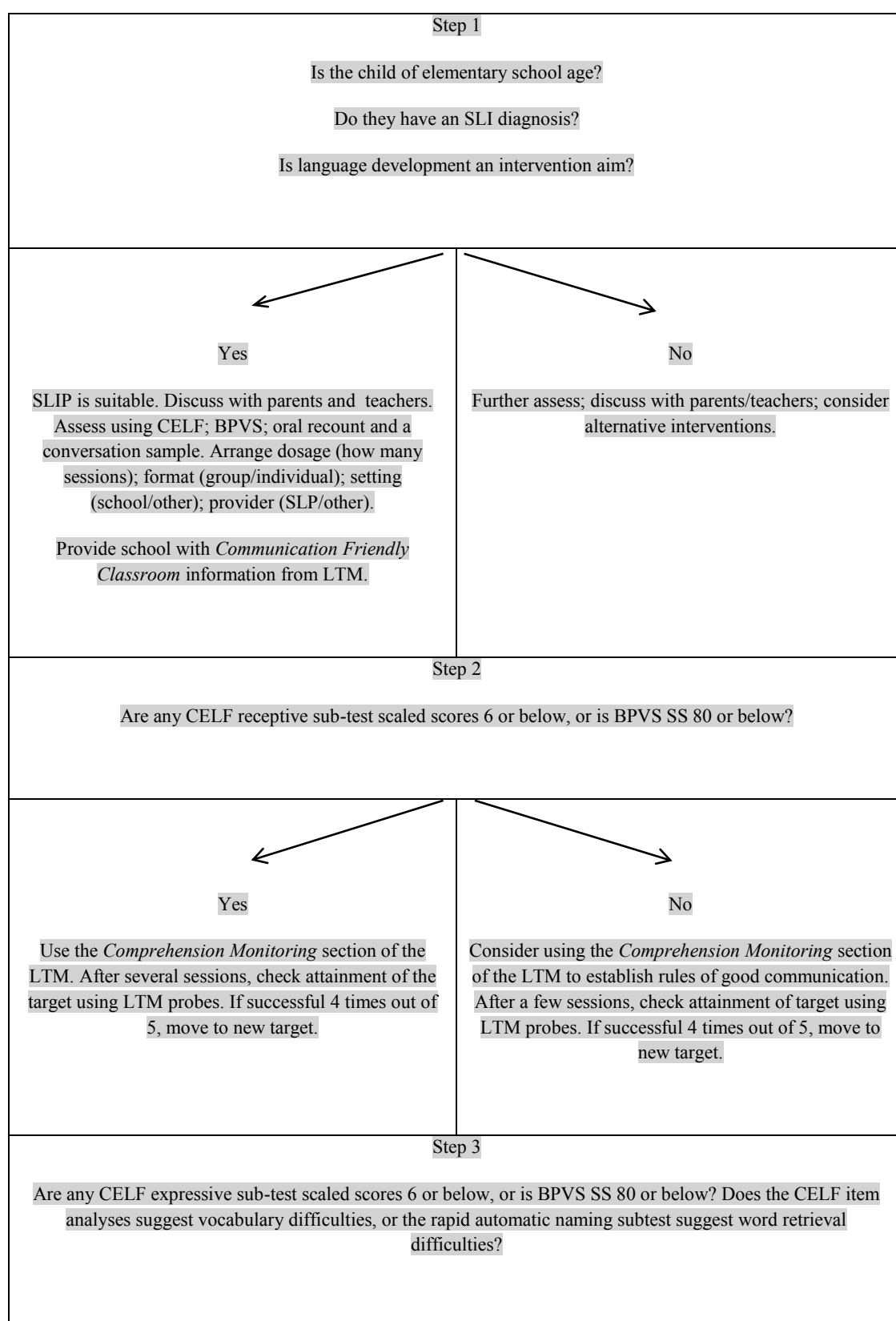
Flow of Participants through the trial (from Boyle et al., 2007)

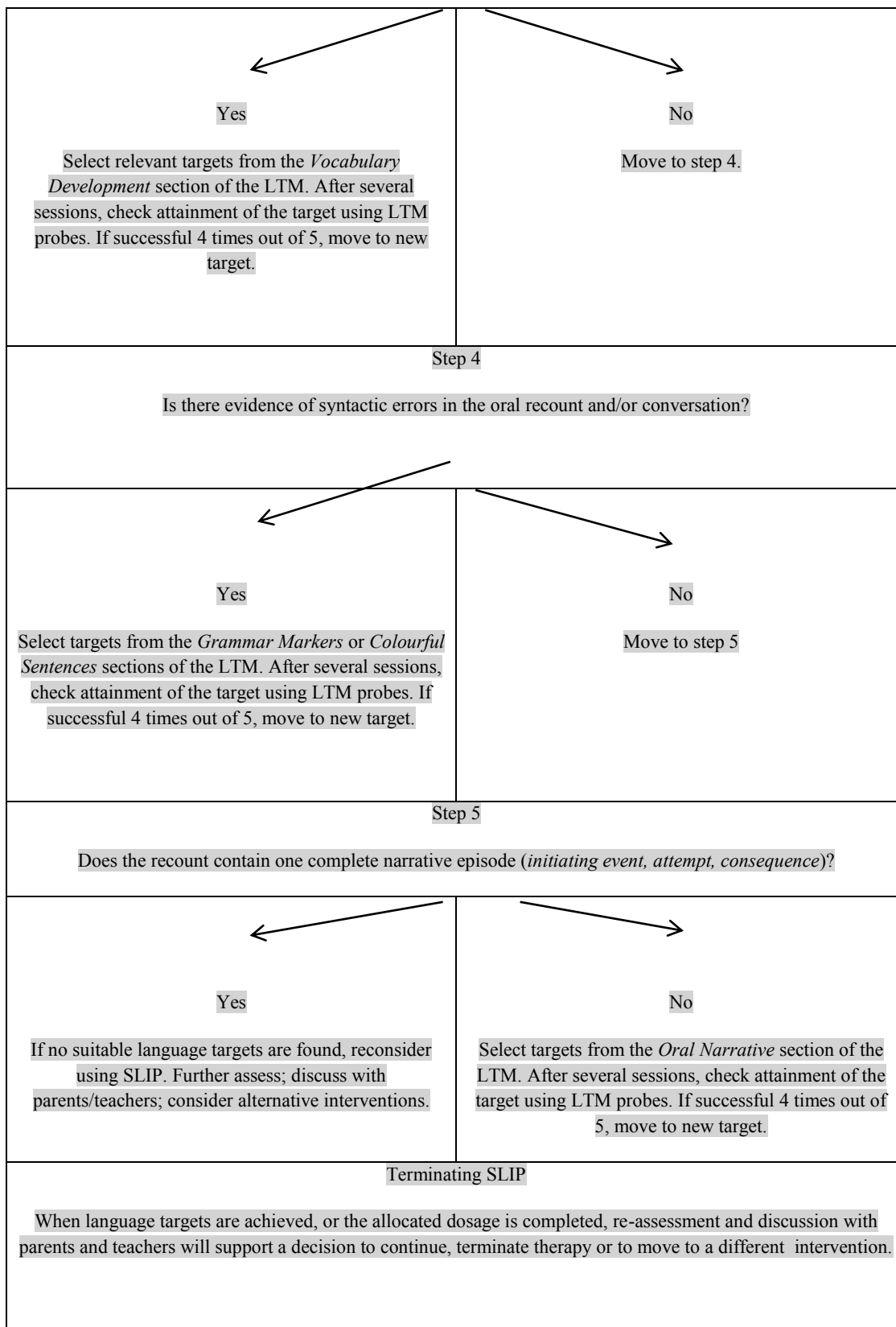


Flow of participants through the trial: *¹ one child was randomized with IQ = 75, one point too low; *² two children could not be grouped due to age (they were offered limited individual therapy as part of a duty of care but not further included in the study); *³ two children could not be grouped due to age (offered limited individual therapy as part of a duty of care but not further included in the study); one child was randomised with IQ = 75, one point too low; **¹ two children were withdrawn from T2 assessments by their parents and one child left the area; **² one child was withdrawn from T2 assessment by its parent; **³ one child was withdrawn from T2 assessment by its parent; and ⁻¹ two siblings were withdrawn by their parent from follow-up assessments.

Figure 17.2

Useful steps for beginning SLIP with a child.





Description of the video clip

The video demonstrates three activities from the *SLIP Language Therapy Manual* as used by Lewis, the child described in the accompanying case study. The activities relate to three of Lewis's intervention targets: (1) increasing word knowledge, vocabulary and word-finding abilities through understanding the semantic features of words, using a word-web, (2) understanding and appropriate use of selected words that mean the same or similar things (*synonyms*) and words that mean opposite things (*antonyms*), and (3) understanding and using the terms *all*; *all but one*; *none* and *some*.

We had some ethical concerns about asking a language-disordered child to appear on the video. The three language-learning activities are therefore demonstrated by Alex, who is nine, around the same age as Lewis. Alex does not struggle with language, and can read well, but is friends with some children in his class who do struggle. He kindly agreed to demonstrate the activities with an SLP.

Alex already understands the key meanings of *synonym* and *antonym*, although these terms are only taught to school-children (in England) who are around a year older. Lewis concentrated on examples of specific words that were the similar or opposite in meaning, but was not expected to use the terms *synonym* or *antonym*.