The nature of metacognition in speech and language therapy for children with pragmatic language impairment

A thesis submitted to the University of Manchester for the degree of Master of Philosophy in the faculty of Medical and Human Sciences

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Abstract

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Abstract of thesis submitted in November 2014 by Jacqueline Gaile for the degree of Master of Philosophy in the Faculty of Medical and Human Sciences.

The nature of metacognition in speech and language therapy for children with pragmatic language impairment

Metacognition is thinking about thinking and taking action to ensure success on tasks. Metacognitive knowledge of the person, task and strategy variables in any given cognitive enterprise are monitored and controlled in acts of self-monitoring to make progress. Metacognitive knowledge and skills support self-monitoring and generalisation. Comprehension monitoring is a metacognitive skill and children with developmental language disorders (DLDs) are known to benefit from speech and language therapy (SLT) that includes metacognition, but the nature of metacognition in SLT or how it operates in therapy delivery is unknown.

Theories of therapy in SLT typically use theories of impairment to determine therapy goals; intervention studies typically report therapy outcomes. The result is that there are relatively few theories of therapy that can describe the process of therapy in terms of clinical actions in delivery and the interaction in therapy that controls how tasks are delivered.

This study aimed to determine the nature of metacognition in therapy from a manualised SLT intervention as delivered within a randomised controlled trial, the Social Communication Intervention Project (SCIP) (Adams et al. 2012a). The current study aimed to examine SCIP therapy in more detail using thematic analysis in order to contribute to a 'theory of therapy' and add to the evidence base for practice by providing clarity for practitioners on how SCIP therapy was implemented in the RCT.

Video data of therapy sessions collected in the SCIP RCT were purposively sampled to select a representative sample of SCIP participants and therapy content and delivery for analysis (N=8). Existing theory on metacognition as a construct in learning was incorporated into analysis from the beginning. Through cycles of iterative analysis, a preliminary list of key concepts in metacognition was developed into a Metacognitive Coding Framework (MCF).

Thematic analysis revealed the presence of metacognition in the content and delivery of SCIP intervention. Metacognition was a feature of how children's ability to monitor language, pragmatic and social interaction skills in themselves and other people was developed. Error detection was employed to teach problem-solving, that is, metacognitive skills of monitoring and control were an explicit feature of SCIP intervention. SCIP therapy agents were observed to change the task design and delivery to include a particular focus on self-monitoring as a distinct part of the therapy process. A model of the SCIP therapy process has been developed to show the nature of metacognition in SCIP therapy content and delivery.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Acknowledgements

List of Abbreviations

ASD	Autism Spectrum Disorders
CA	Conversation Analysis
CCC-2	Children's Communication Checklist 2nd edition
CELF-4	Clinical Evaluation of Language Fundamentals 4th Edition
CELF-4 CLS	Core Language Score
DLD	Developmental Language Disorders
ERRNI	Expressive and Receptive Recall of Narrative Instrument
GCC	General Communication Composite
JDTP	Junior Detective Training Program
LI	Language Impairment
LSA	Learning Support Assistant
LP	Language Processing
MCF	Metacognitive Coding Framework
MRC	Medical Research Council
NHS	National Health Service (UK)
NRES	Northern Research Ethics Committee
PDD-NOS	Pervasive Developmental Disorder Not Otherwise Specified
PLI	Pragmatic Language Impairment
PRAG	Pragmatics
RCPM	Raven's Coloured Progressive Matrices
RCT	Randomised Controlled Trial
RSLT	Research Speech and Language Therapist
RT	Reciprocal Teaching
SCIP	Social Communication Intervention Project
SCD	Social Communication Disorder
SCQ	Social Communication Questionnaire

List of Abbreviations (continued)

SLT	Speech and Language Therapist/Speech and Language Therapy
SLTA	Speech and Language Therapy Assistant
SUSI	Social Understanding and Social Interaction
TAU	Treatment as Usual
ThA	Therapy Assistant in SCIP RCT
UK	United Kingdom of Great Britain and Northern Ireland
WWW&H	What, When Why and How Rule
ZPD	Zone of Proximal Development

1 Introduction and background to the current study

1.1 Purpose of the study

This research proposed to investigate the nature of metacognition in speech and language therapy (SLT) for children who have pragmatic language impairment (PLI). The facilitation of language and communication skills through enhancement of metacognitive processes is thought to be a frequently used component of intervention for these children, yet the nature of metacognitive instruction in SLT has not been studied before with this population. Whether there is any benefit to these children of receiving intervention that is rich in metacognitive content can only be tested once a means of identifying its presence and function in therapy delivery is available.

The purpose of this research is to determine which aspects of metacognition can be identified in speech and language therapists' interactions during therapy with children with PLI. In order to do this, analysis of video data of therapy delivered in a randomised controlled trial (RCT) of intervention, the Social Communication Intervention Programme (SCIP), (Adams, Lockton, Freed, Gaile, Earl et al., 2012a) will be carried out. A method of analysis will be constructed which is appropriate to the purpose of the research and the nature of the data. A method of coding metacognitive content in the therapeutic interaction between speech and language therapists (SLTs) and children with PLI will be developed and a thematic analysis of the identified metacognitive content of the intervention will be developed to explain the nature of metacognition in SLT intervention. Examples of identified metacognitive content of SLT intervention will be presented.

1.2 Overview of the thesis

The thesis begins by providing the context of the current study. Details of the SCIP RCT and the SCIP intervention method are reported in section 1.3. The author of this work was the research speech and language therapist (RSLT) for the SCIP trial. The current study arose from the researcher's role within the SCIP RCT, but is distinct and complementary to it. All analysis presented in this thesis is the original work of the author and has not been reported elsewhere. The researcher's role as RSLT is reported in full in section 1.4.1. A reflexive account of this role and the arising potential for bias in the present research is reported in section 1.5.

The literature review is then presented in three parts in Chapter 2:

- a review of theories and models of therapy, including developmental models
- a review of the developmental literature on metacognition, including consideration of metacognitive knowledge and metacognitive skill
- a review of methods suitable for analysis of the interaction in SLT intervention with children

The literature review ends with a justification for the chosen method, thematic analysis of video data. The primary research aim is set out at the end of Chapter 2 in Section 2.5.

Chapter 3 contains the method for the current study. This chapter states the ethical permissions and procedures, a description of the study materials and the theoretical and purposive sampling of material from the SCIP RCT intervention video data set. The selection of an appropriate critical case, including the rationale for the choice and a description of the characteristics of the therapy content for the critical case is reported. A description of the other participants selected for the current study and the content of their SCIP intervention videos selected for analysis follows. The specific steps taken within the method to develop an initial metacognitive coding framework (MCF) from an inductive and deductive analysis of the critical case are described. The process of using the initial MCF to code the remainder of the sample in cycles of iterative analysis is then presented.

Chapter 4 presents the main findings of the thesis. This chapter presents the development of a finalised coding framework with examples of how data were broken down and coded. The final MCF is presented in full. Results are presented in four sections to represent the four main themes found in the data. The final section of the Results chapter presents the main over-arching metacognitive theme in SCIP SLT with illustrations of how components of SLT content and delivery relate to its metacognitive content. A summary of the main findings is provided.

Chapter 5 discusses the findings in light of the research aim. The metacognitive content and themes shown in the findings are discussed in relation to the SCIP therapy process and potential mechanisms of change. The contribution of the study to both clinical and theoretical domains is considered. This chapter also considers the limitations of the current research and provides suggestions for future research in this field. Finally, the author provides a reflection on the study methods and context from the perspective of the qualitative research paradigm.

1.3 The Social Communication Intervention Project (SCIP)

The SCIP RCT aimed to determine the effect of the SCIP manualised intervention on the language abilities and functional pragmatic and social communication skills of school-aged children with PLI as measured by formal assessment and parent and teacher report, (Adams, Lockton, Freed, Gaile, Earl et al., 2012a). An intensive model of SLT delivery, (the SCIP intervention condition), was compared to the control condition of Treatment as Usual (TAU) delivered by local National Health Service (NHS) SLT services.

The data used for analysis in the current study are video recordings of SLT intervention sessions gathered during the SCIP RCT. Trial participants, protocol and outcomes will now be described to provide an overview of the context in which the video data were gathered. A description of SCIP Intervention and the role of the RSLT is provided in Section 1.4.1. A reflexive account of the role of the author in the trial intervention is given in Section 1.5.

1.3.1 SCIP participants: children who have Pragmatic Language Impairment

Children with PLI have disproportionate difficulty in using spoken language for conversation and social interaction and are thought to have features of both language impairment (LI) and autistic spectrum disorder (ASD) (Bishop, 2000; Kjelgaard & Tager-Flusberg, 2001; Leyfer, Tager-Flusberg, Dowd, Tomblin, & Folstein, 2008). These children are most commonly identified by their unusual use of language but they may also have subtle difficulties with high-level language processing such as making inferences (Botting & Adams, 2005; Norbury & Bishop, 2002). Difficulties are also reported in understanding and expression of discourse level language (Norbury, Gemmell, & Paul, 2014). In conversation, children with PLI make frequent inappropriate comments, interrupt their partner and can be either reticent or extremely talkative (Adams & Bishop, 1989; Bishop & Adams, 1989). The difficulties experienced by children with PLI can limit educational progress (Adams, Baxendale, Lloyd, & Aldred, 2005) and these children are at risk of social isolation and mental health difficulties in later life (Whitehouse, Watt, Line, & Bishop, 2009).

Since the publication of the SCIP RCT, revision of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013) has created a new category of Social Communication Disorder (SCD) in the Neurodevelopmental Disorders/Language Impairment pathway. The characteristics of SCD are almost identical to those of PLI: Persistent pragmatic difficulties which affect social function; persistent language difficulties

that may affect comprehension and expression; absence of ASD (absence of restricted, repetitive patterns of behaviour); the condition is evident from early childhood. It should be noted that some research reported in this thesis uses the label SCD rather than PLI; the labels can be considered interchangeable. For the purposes of consistency, the group of children who are studied in this thesis will be described as having PLI in keeping with their description in the RCT.

Participants in the SCIP RCT were children with PLI aged 6;0 to 10 years 11 months. Inclusion criteria were:

- at least 2/5 on the SCIP Social Communication Behaviour Checklist[1]
- score ≥ 5th centile on the Raven's Coloured Progressive Matrices (RCPM; (Raven, 1979), a test of non-verbal perceptual/analogical reasoning skills
- score in the communication impaired range (≤ 58) on the General Communication Composite (GCC) of the Children's Communication Checklist[2], second edition (CCC-2) (Bishop, 2003).

In addition, all children attended mainstream primary schools and had been identified as having special educational needs (Adams et al., 2012a).

1.3.2 SCIP trial recruitment and baseline testing

Participants for the SCIP trial were recruited from local NHS SLT services in the North West of England and the South East of Scotland and screened by the trial research team to determine suitability for inclusion to the SCIP trial. Of 101 children screened, 88 met criteria for inclusion in the RCT and were allocated in a 2:1 randomisation to receive either SCIP intervention (N=59) or TAU (N=29). For children in the SCIP intervention group, local SLT provision was suspended. Details of the numbers of participants recruited, screened, randomised and withdrawing from the SCIP RCT are shown in Figure 1.

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[1] The SCIP Social Behaviour Communication Checklist is in Appendix 1
[2] The CCC2 is a questionnaire completed by a caregiver used to identify communication and pragmatic language difficulties.

Figure 1: Overview of SCIP recruitment and randomisation (reproduced from Adams et al., 2012a)
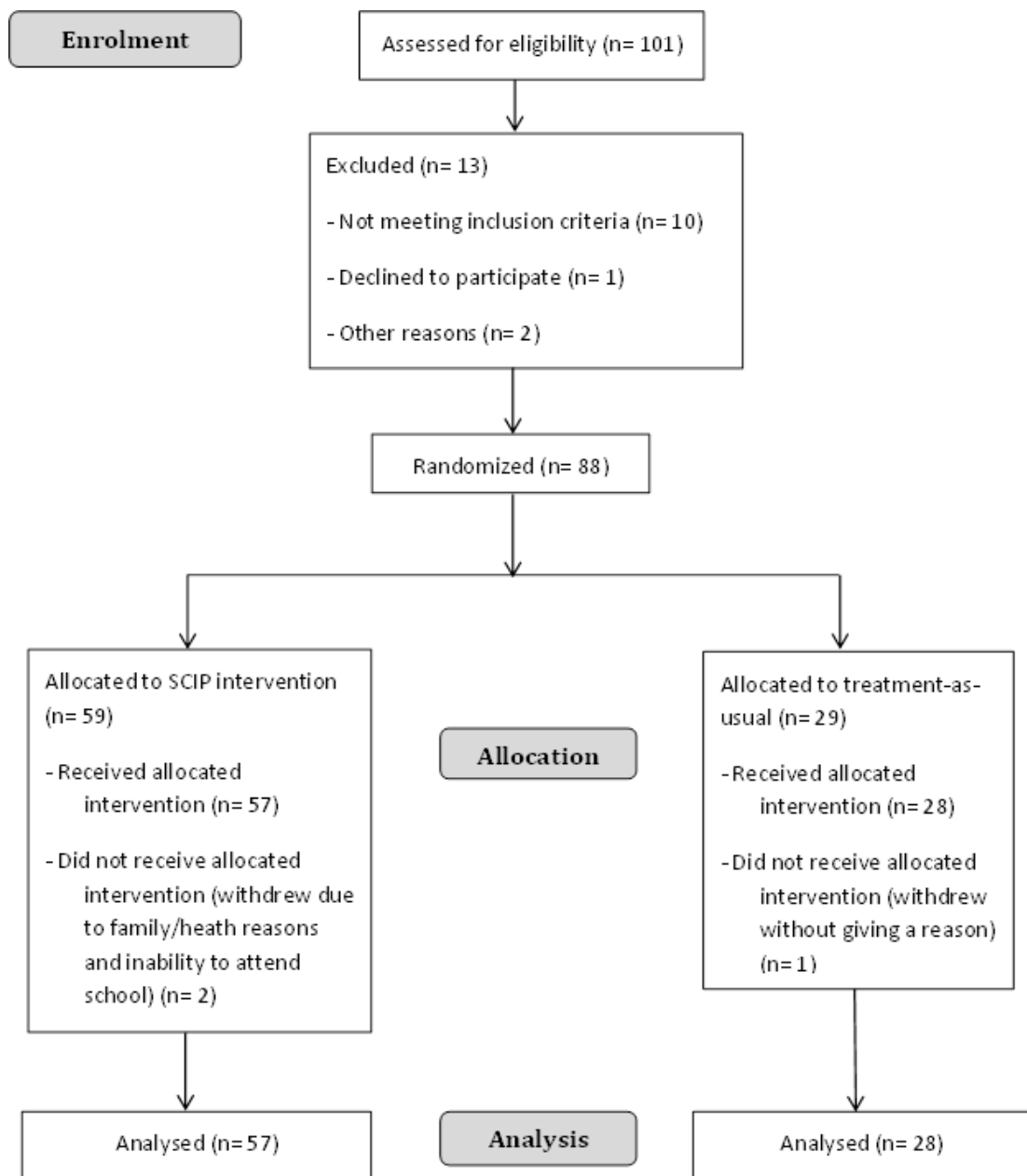
Prior to intervention, all participants completed a battery of language and social communication assessments. Data indicated that the whole group showed heterogeneity in these skills and that 48% of children demonstrated features consistent with a diagnosis of mild ASD (using the Social Communication Questionnaire (SCQ) (Rutter, Bailey, & Lord, 2003)). On measures of language, a range of scores, from severe to mild impairment, were found using the Clinical Evaluation of Language Fundamentals (CELF-4) (Semel, Wiig, & Secord, 2006) and the Expressive Receptive Recall of Narrative Instrument (ERRNI) (Bishop,

2004). There were no significant differences between the control and intervention groups on baseline measures (Adams et al. 2012a) (see Table 1).

Table 1: SCIP trial participant clinical characteristics profile at baseline (N=87)

	Mean	Range	SD
Age (months)	100.5	71–128	15.0
CCC-2 GCC	29.3	6–57	12.0
RCPM percentile	53.5	5–96	28.6
CELF-4 CLSS	72.6	40–114	18.3
ERRNI-Initial telling	90.9	64–135	17.4
ERRNI-Recall	86.4	64–136	18.2
ERRNI-Comprehension	87.7	64–125	16.0
SCQ (n = 84)	20.3	2–37	7.9

Key: CELF-4 CLS = Core Language Standard Score; Notes: RCPM percentile ranges transformed into percentile midpoints, e.g. 5th-10th percentile becomes 7.5th percentile. CELF-4 Standard scores have a population mean = 100 (References for tests are shown in the text).

1.3.3 SCIP trial intervention protocol

Following randomisation (see Figure 1) 59 children were allocated to the SCIP intervention group and were seen on a 1:1 basis in their school by a RSLT or a specially trained SCIP Therapy Assistant (ThA). The remaining children carried on with their established SLT service and received no additional therapy.

A manual of intervention was written to support the delivery of SCIP during the trial. The manual and further intervention procedures were reported by the research team in a companion paper to the trial (Adams, Lockton, Gaile, Earl, & Freed, 2012b). This paper reports an audit of the SCIP manual's use across all trial participants and analyses the contexts of participants' intervention. All intervention was planned by the RSLT and derived entirely from the SCIP manual. Therapy was delivered intensively over the course of one school term with children receiving one hour of intervention up to three times a week for a maximum of 20 hours. If children had a designated Learning Support Assistant (LSA), that person was encouraged to attend the sessions and support the generalisation of skills to the child's day-to-day functioning. Parents were invited, but rarely attended intervention

sessions and instead were kept informed of therapy goals and progress through a home-link book (Adams et al., 2012b).

1.3.4 SCIP Randomised Controlled Trial outcomes

SCIP trial outcome measures were reported at Time 2, immediately post-intervention and at Time 3, six months later. No significant treatment effect was found on formal language testing at Time 2 or 3. Significant effects of SCIP intervention were found for secondary outcomes of functional pragmatic and social communication skills. On a blind measure of conversation skill, children in the intervention group were found to have improved conversation skills at six months post-intervention. Parent reported outcomes showed significantly improved social communication skills and increased understanding of social situations in support of SCIP intervention at Time 2 and Time 3. Significant differences in the classroom-learning skills of children in the intervention group were reported by class teachers, relative to the TAU group at six month follow up.

1.3.5 Critical analysis of the SCIP trial

SCIP is the first RCT of effectiveness of SLT for children with PLI and provides moderate evidence in favour of SCIP over TAU. The study meets methodological quality standards required for RCTs in providing rigorous randomisation and blinding of assessors to groups status. The study under-recruited, but had very little attrition (3%) resulting in a final N=85, and the ratio of 2:1 allocation to intervention or control was maintained (59:29). However, participants and their carers/teachers could not be blinded. Whereas this may contribute to outcome bias, it is noted that such studies inevitably cannot achieve this criterion given that participants' involvement and understanding in the therapeutic process is a key ingredient of the intervention. Replication of these results and clearer diagnostic profiling of participants would enhance the reliability of the findings.

Key outcomes focused on both blind measured outcomes (e.g. conversation skills) and on parent/teacher reported outcomes. Parent reports of significant change after intervention, while subject to halo effects, did triangulate with the blind measure of conversation and a measure of reported change using selected items from the CCC-2 (Bishop 2003). Changes in social communication, social behaviour, classroom learning skills and conversation abilities resulting from SCIP intervention were maintained at six-month follow-up and suggest that generalisation of skills from the direct therapeutic input to the child's day to day functioning was achieved. Children with pragmatic and social communication needs

(especially where ASD is also diagnosed) are known to have particular difficulty in generalising skills taught in clinical settings to real life (e.g. (Barry et al., 2003; Williams White, Koenig, & Scahill, 2006)). Further examination of SCIP intervention as delivered is needed to determine whether the content and/or delivery of the SCIP manualised intervention has a particular role to play in generalisation of skills for children with PLI and features of ASD.

This section has provided a brief description and appraisal of the SCIP RCT. However, since the current study intends to examine the nature of metacognition in SCIP intervention, a more detailed account of the SCIP intervention content and structure will now be provided.

1.4 The structure and content of SCIP Intervention

In line with Medical Research Council (MRC) guidelines for the development of complex intervention evaluations (Medical Research Council, 2008), a therapy manual was developed for use in the SCIP trial to control the content and delivery of the intervention. The SCIP therapy manual specified the procedure for assessment and intervention planning, described the protocol for therapy delivery and contained all the therapy activities that made up the content of the intervention (Adams et al. 2012b). The SCIP manual content reflected the extensive literature on the nature of the impairment in children with PLI (e.g. (Bishop & Norbury, 2002; Leyfer et al., 2008; Norbury & Bishop, 2002) and the content and rationale of single case studies of SLT interventions for this population (e.g., (Adams et al., 2005; Adams, Lloyd, Aldred, & Baxendale, 2006; Brinton, Fujiki, & Robinson, 2005; Timler, Vogler-Elias, & McGill, 2007). The intervention rationale was set out in advance (Adams, 2005) and reflects the position that pragmatic skills emerge in typical development as a product of an interaction between language, social and cognitive development.

The content of the SCIP therapy manual was comprised of three main areas of need known to occur in children who have PLI: Language Processing (LP), Pragmatics (PRAG) and Social Understanding and Social Interaction (SUSI). These three aspects each contain a series of five components, e.g. PRAG contains PRAG 2 *Understanding information requirements*. Within each component there are a number of therapy goals, e.g., PRAG 2 contains PRAG 2.1 *Too much / too little information*; each goal has up to five therapy activities associated with it (Adams et al. 2012b). This embedded structure is repeated across all three SCIP

intervention aspects, providing a large number of therapy activities for use in SCIP intervention sessions. Table 2 is reproduced from Adams et al. (2012b p. 250) and shows the three main aspects and their embedded components in the SCIP trial intervention manual.

Table 2: The content of SCIP intervention showing the three main aspects and their components

Language Processing (LP)	Pragmatics (PRAG)	Social Understanding and Social Interaction (SUSI)
LP 1 Word-finding and vocabulary interventions	PRAG 1 Working on conversation skills	SUSI 1 Understanding social context cues
LP 2 Improving narrative construction	PRAG 2 Understanding information requirements	SUSI 2 Understanding emotional cues
LP 3 Understanding and using non-literal language	PRAG 3 Improving turn-taking skills	SUSI 3 Increasing flexibility through strategies
LP 4 Improving comprehension of discourse (metapragmatics)	PRAG 4 Managing topic change and drift	SUSI 4 Understanding thoughts and intentions of others
LP 5 Enhanced comprehension monitoring	PRAG 5 Improving and expanding discourse styles	SUSI 5 Understanding friendships

An assessment-to-intervention mapping procedure was used to identify components of intervention from the child's baseline test scores and parent and teacher concerns. Standard scores (SS) of 5 or below (very impaired) on CELF-4 subtests or equivalent on other language assessments triggered specific components of intervention. For example, CELF subtests Word Structure and Recalling Sentences triggered the inclusion of the LP1 component on Vocabulary and word-finding interventions. Parent report on the CCC-2 identified areas for intervention in LP, PRAG and SUSI aspects; word-finding difficulties, conversation skills of listener awareness and friendship experiences as reported by parents were mapped to LP 1, PRAG 2 and SUSI 5 respectively.

1.4.1 Delivering the intervention in the SCIP trial: the role of the Research Speech and Language Therapist

An individualised programme of intervention was built up for each participant by the RSLT using the mapping procedure. Intervention priorities were agreed with parents and school staff from their baseline reports of concerns and formal assessment data. Intervention goals were selected from all three aspects of the intervention manual (LP, PRAG and SUSI)

and adjusted by the RSLT as the child proceeded through SCIP intervention in response to progress and emerging priorities (Adams et al., 2012a).

All SCIP intervention was delivered by the RSLT or by specially trained and closely supervised SCIP ThAs. The RSLT held a small SCIP caseload in addition to delivering some intervention sessions with every child in the intervention group. Initially, the RSLT delivered every other therapy session observed by the ThAs. The RSLT designed and delivered an intensive training module to all SCIP ThAs.

Liaison with parents and school staff for all children in the intervention group was essential to the implementation of the intervention and was the primary responsibility of the RSLT throughout the intervention period (Adams et al., 2012b). Meetings and telephone calls with parents and staff were designed to involve them in setting and achieving the intervention goals and implementing strategies at home and in school; gathering pertinent recent examples of breakdown in social communication and interactions for use in therapy sessions; and assisting them to generalise skills learned in therapy to the child's day-to-day functioning. The RSLT was responsible for coordination of liaison between ThAs, parents and teachers via face-to-face meetings. Although not uniform across the group, LSAs designated to support the child with PLI attended the SCIP therapy sessions and this provided the chief contact with and means of training for LSAs.

1.5   Reflexivity in the current study

Reflexivity is defined here as a process of documented "thoughtful, conscious self-awareness" which serves to evaluate the researcher's subjective experiences and responses and which assists in raising awareness of how knowledge is constructed (Finlay, 2002 p. 532). Reflexivity in qualitative research limits the potential for bias and enhances the trustworthiness of the findings. Reflexivity can be considered to exist on a continuum from reflection at one end, defined as actively thinking about something after the event, to reflexivity at the other, described as the continuing, dynamic and subjective self-awareness that happens in time with the experience (Finlay, 2002).

Finlay (2002) illustrated the benefits of reflexivity at different stages in the research process. In the pre-research stage, the researcher examines their motivations for the choice of topic for study and attempts to understand their relationship to it. Insights into why a particular topic is of interest can be gained from an examination of the existing

literature which can bring the researcher's implicit knowledge into conscious awareness. In the data collection phase, reflexivity is employed to understand the method of data collection, specifically the researcher's role in the method and their response to the participants in the data collection phase. During data analysis, reflexivity can be a powerful research tool with the potential to reveal beliefs, attitudes and behaviours in the researcher they were previously unaware of.

Finally, Finlay argued that a balance between researcher experiences and insights and findings from the research enquiry is needed when reporting qualitative findings. Researchers should continue to reflect on their assumptions, mistakes and emerging insights as they progress through research design, analysis and the reporting of findings. Reflexive accounts should be limited to reporting where insights had an influence and impact on the research process.

Within the current study, the process of reflexivity is an important component of the research activity. The experience of being the SCIP RSLT has influenced the research aim, the choice of topic for investigation and the data used for analysis in this study. Guided by Finlay's (2002) review, a reflexive account of the role of the RSLT and its influence on the pre-research stage of the current study is reported next. A reflexive account of the development of the research aim for the study is reported in Section 1.7.

1.5.1 Reflexive account of the role of the Research Speech and Language Therapist

A reflexive account of the two key roles of the RSLT outlined above is presented here with commentary on how this impacted on research design.

1.5.1.1 SCIP intervention planning and delivery

Planning and delivering therapy to children in the SCIP RCT from a manualised intervention was unique in my career and provoked an examination of tacit knowledge of therapy actions and content for children with PLI gained over 20 years in clinical practice. The three aspects of LP, PRAG and SUSI became my internal therapy framework within which intervention for children with PLI became explicitly conceptualised. Additionally, my clinical decision-making processes were made overt through the prescribed assessment-to-intervention planning procedure. Questions arising for me at this point in the pre-research stage of this study were concerned with how theory of language development and disorder relate to therapy goals and clinical decision-making. For example, how do I (SLTs) make

decisions about intervention goals from assessment findings? How do SLTs prioritise therapy goals? How do SLTs use parent and teacher concerns to decide therapy goals?

Meetings with the ThAs were frequent and practical in nature; we watched each other work live, on video and in demonstrations of SCIP activities in group supervision. Talking about and demonstrating therapy skills provided insights into how complex SCIP intervention was and revealed that the same therapy materials were being used differently to achieve different goals. This provoked questions around how complexity of therapy is built up in delivery to the child and revealed the assumption that one learns how to deliver therapy by watching others work.

1.5.1.2   *Working with parents and school staff*

Liaison with parents, LSAs and teachers was regular and had a therapeutic function for each individual child to educate them on the child's needs and how they could support the child in development, maintenance and generalisation of targeted skills. These discussions also provided insights into their perceptions of change within the child. Reflecting on information gained from liaison with families and staff across the SCIP cohort provoked in me questions about the nature of skills that had changed, how these skills had developed and why one particular skill had changed and not another. Discussions of change by parents and teachers implied a generalisation of skill from the therapy sessions to real world interactions, but not an explanation of how or why these changes had generalised. Generalisation of social communication skills is known to be very difficult for children with ASD conditions and so I was interested to know if the presence or absence of ASD in the child's profile was important or whether there was something in SCIP intervention that particularly assisted generalisation.

1.5.1.3   *Impact of pre-research knowledge and assumptions on research design*

In summary, the role of SCIP RSLT was a unique lived experience leading to the generation of many questions for the candidate about the nature of the content and delivery of SLT intervention. The combined exposure to the content, method and principles of SCIP delivery within an RCT had raised tacit knowledge to conscious awareness. Two assumptions relevant to the design of the current study are noted. Firstly, that learning about the therapy process is achieved through observation which directed the study to an analysis of existing video-recordings of SCIP therapy.

Secondly, being immersed in intervention planning and delivery, and using the SCIP manual daily, raised my clinical decision-making skills to a conscious level and provoked curiosity

about goal-setting, therapy delivery and essential ingredients of SCIP. I had acutely experienced a shift in my clinical decision-making skills from tacit to explicit and found myself in need of a more developed vocabulary to talk about the component parts of therapy. My tacit approach to setting therapy goals was revealed to rely on knowledge of typical development and to have a bias in selecting goals that are relevant to and generalizable to other contexts. This second assumption led me to framing the current analysis within existing literature on theories or models of therapy that explain such aspects as how goals are arrived at. My motivation for pursuing an analysis of SCIP intervention arose from observations and reports of perceived change in individual children of different clinical profiles. A report of individual outcomes was appealing as a clinician, but changes in my tacit knowledge of therapy as reported above enabled me to conceive of a study that might explain SCIP therapy in either more general or more specific terms.

1.6 Development of the rationale for the current study

1.6.1 Service users' perceptions of SCIP trial outcomes and preferred therapy components: findings from Baxendale et al (2013)

In a complementary study to the SCIP trial (Baxendale, Lockton, Adams, & Gaile, 2013) semi-structured interviews (conducted with parents and teachers of a subset of SCIP intervention group children) were used to scope service users' perceptions of change in individual children's communication and learning skills. Thematic analysis revealed parents and teachers had perceived changes in the children's social skills, academic attainment, behaviour and self-esteem and in their own understanding and management of the child's needs (Baxendale et al., 2013). Parents perceived change as generalising to contexts at home and therefore impacting on the family dynamic as a whole. Parents reported changes in their children's ability to understand and express their feelings, and improvements in being able to relate events coherently. Greater flexibility and improved ability to discuss and solve problems were important outcomes for parents.

Teachers valued therapy on listening skills, narrative and comprehension monitoring which they saw as transferring to classroom-learning skills. Changes in academic skills were reported in literacy and numeracy and in the quality and quantity of written work. Teachers

reported that comprehension monitoring was central to the changes they perceived in the children's independence and management of their emotions.

Baxendale et al. (2013) did not set out to provide evidence of effectiveness of SCIP, but the thematic analysis of interviews with participants provided rich data to further explain the implementation of SCIP intervention and parents' and teachers' perceptions of outcomes. The findings from the study are limited to those of a few individuals, but iterative coding of themes arising in the interview data provide support for the salience of those themes and the key roles that certain aspects of the intervention played in users' understanding of the intervention.

Baxendale et al. (2013) provide additional insights into parent and teacher perceptions of generalised change after SCIP intervention. Clearly substantive changes are being made in the way in which children are participating in social communication with a range of others in their own lives. The thematic analysis in Baxendale et al. hints that certain components of intervention have been perceived as especially salient and/or frequent in the therapy. These include aspects of metacognition (such as comprehension monitoring) and generalisation of learned social communication skills. It was the belief of parents and teachers in this study that some skills generalised to home and school contexts in response to SCIP intervention. Changes perceived by parents and teachers in narrative ability, comprehension monitoring and improved problem solving and emotion understanding overlapped with the SCIP frequently used components of therapy identified in Adams et al. (2012b).

It is these findings and the trial outcomes that led to the development of the rationale for the current study. MRC guidelines (2008) recommend that in order for outcomes from best evidence studies to be implemented in practice further investigation is needed to explain factors in the intervention and the context that might facilitate or impede implementation.

1.6.2 **Key ingredients of SCIP intervention: The role of metacognition**

Baxendale et al.'s analysis and expert opinion (Adams, 2005; Norbury & Bishop, 2003; Norbury et al., 2014; Spackman, Fujiki, & Brinton, 2006; Swanson, Fey, Mills, & Hood, 2005) indicate that support for narrative, comprehension monitoring, and verbal emotion understanding are key ingredients of intervention for children who have PLI and have the

potential to impact on the children's social communication functioning, independence in classroom learning and general well-being.

The rationale for the current study arose from a desire to identify what is happening in the therapy process to support changes in these aspects of communication. One of the potential key characteristics of all these aspects of therapy is that they are underpinned by *metacognitive* skill expressed within the therapy targets and the use of sabotage (deliberate errors) as a method of metacognitive instruction. Identification and description of how the therapist incorporates metacognition into episodes of SCIP therapy content or delivery can contribute to understanding of effects and point towards appropriate therapist and service-user training strategies.

In order to examine what aspects of metacognition are present in SCIP intervention an examination of the intervention as it was delivered is needed. Previous work in this field e.g. (Law, Campbell, Roulstone, Adams, & Boyle, 2008) has relied on SLTs' reports of therapy activities and rationales for those choices, but these reports did not make explicit reference to theoretical knowledge or to models of metacognition. A study that incorporates a detailed analysis of the role of metacognition from transcriptions of therapy interactions has not been attempted with this group of children.

1.7   Reflexive commentary on the development of the current study

Finlay (2002) recommended examining the existing literature to bring the researcher's implicit knowledge of the chosen research topic into conscious awareness. In the preparation of the research proposal for this work, I was influenced by two authors in particular: a study by Law et al. (2008) examining SLTs' rationales for practice; and a book, The Reflective Practitioner by Schön (1983). I recognised myself in the description of SLTs provided by Law et al. (2008) who conceptualised therapy as being primarily concerned with teaching language skills or teaching skills to cope with communication breakdown, which was labelled skills acquisition and metacognitive. I further identified with the SLTs studied by Law et al. in prioritising comprehension monitoring and metacognitive training for children with LI.

The combination of RCT findings, my RSLT experiences and the findings of this paper confirmed the selection of metacognition as the topic under investigation in the current study. There is an acknowledged implicit knowledge of the concept of metacognition as an

over-arching learning theory at this point in the pre-research stage of my current study which further identified the need to control for my tacit knowledge of metacognition in data analysis. This point is returned to in a reflexive report on selecting an appropriate method of analysis in Section 5.4.

Schön (1983) argued that practitioners who view each client as a 'universe of one' provide a particular perspective from which to view reflective practice. He proposed that these professionals make, test and use interpretations of the client's 'data' to make and test approaches for intervention by employing "disciplined subjectivity" (Schön 1983 p. 116). Reflection-in-action for these professionals requires them to understand how they frame a question, how they make use of their accumulated experience and prior knowledge, and how they can bring rigour and some degree of objectivity to the intervention process (Schön, 1983).

The concept of client as a 'universe of one' made me consider whether a detailed look at SCIP intervention cases using case study methodology may be the best way to understand practice further. However, the selection of cases to study in this way would undoubtedly be influenced by tacit knowledge and I realised I needed a theoretical framework within which to explore SCIP intervention. I further realised that I needed a model of therapy to map my experiences onto and an enhanced vocabulary to talk not just about the content of therapy but also of the mechanics of its delivery. This, together with the findings of Law et al. (2008) regarding the role of metacognition in SLT, allowed me to identify the topic of and method for the current study.

1.8   Summary of background to the current study

A randomised controlled trial of a new intervention, SCIP, for children who have PLI has been described and critically evaluated. The outcomes of the trial and a complementary analysis of service users' perspectives of those outcomes have indicated that there are key ingredients of the intervention which may be used by SLTs across SCIP intervention sessions which promote generalisation of targeted skills and growth in metacognitive learning. The aim of the current study will be to apply appropriate analytic methods to the rich data generated in SCIP intervention sessions so as to ascertain the nature of one of the possible key components in the therapy interactions – metacognition. The next chapter contains the literature review associated with the current study and the background to the thesis.

2 Literature review

Before the main research questions for the current study are presented, this thesis will review the literature regarding models and theories of the therapeutic process in SLT for children who have developmental language disorders (DLD). The literature review will then proceed to briefly describe and evaluate historical and contemporary models/typologies of metacognition and their application to interventions. The last section of the literature review critically evaluates possible methods of analysis appropriate to the research questions and available data.

2.1 The therapy process in intervention for developmental language disorders: Theories, models and rationales.

The literature on the processes involved in SLT for children who have developmental communication disorders will now be reviewed in order to establish existing knowledge regarding frameworks, models and rationales/methods of therapy. The literature review will be selective since there is a vast amount of papers and expert opinion on the subject. The chosen content for the review was constrained by two key factors:

1) key studies will be reviewed that present either:

    a) a *theory of therapy* (that is, a set of ideas or abstract generalisation arising from reflection on pertinent phenomena), or

    b) a *model/framework of therapy*, defined as a representation of a set of phenomena or concepts which allow for better understanding, or

    c) a *rationale for therapy* – the reasons for the chosen intervention content and therapeutic methods.

And

2) key studies will be included that are appropriate to the nature of the intervention under investigation, either because of:

    a) their similarity to the interactive, social nature of SCIP intervention

    b) their application to a similar population – i.e. children with DLDs, including PLI.

Selected key studies meeting these criteria will now be described and evaluated. It should be noted that there is little consistent use of terminology (theory/model/rationale) across

studies so an attempt to clearly identify the principal concepts in each study has been made.

2.1.2 A theory of therapy derived from clinicians' accounts of practice

Law et al. (2008) carried out a study to investigate how SLTs use developmental theories of impairment to make therapeutic decisions. Fifty-six experienced SLTs in the UK contributed accounts of therapy for one child with receptive language impairment from their caseload. Therapists provided details of three recent therapy activities delivered to that child and explained the practical and theoretical rationales for each activity. Analysis sought to identify SLTs' explicit theoretical rationales for therapy actions, extract descriptions of the types of therapy in current practice and provide details of therapy activities. Responses were analysed to determine whether the rationales provided were explicit or tacit and whether they were explained in relation to the child's impairment or the content of therapy.

Fewer than fifty percent of SLTs in Law et al.'s study gave theoretically explicit accounts of their rationales for practice. The majority of rationales were tacit, that is, SLTs could explain why the activity was selected but did not make explicit reference to a theory of impairment to support their choices. Where SLTs did refer to the literature to explain therapy goals they referred to *models* of the impairment and established therapy approaches. Therapy tasks were primarily designed to develop either the child's language skills (skills acquisition) or the child's abilities to reflect on the process of learning language (metacognition) (Law et al. 2008).

This study was based on a small but expert group of SLTs who were engaged in therapeutic planning and activity similar to that embedded in the SCIP trial. Details and reasoning provided by therapists in Law et al. (2008) were systematically analysed using an appropriate methodology (thematic analysis) that allowed the discovery of key themes within the rich data. Such studies are rare, in that much of the therapy literature contains information on therapy outcomes and methods developed by the intervention's authors rather than an explicit reflection on the rationale of choosing from a set of methods. The main contribution of this study was to show how theoretical knowledge of development, impairment and established therapy regimes influenced therapy practice. Law et al. (2008) went further in their abstraction from the study data in proposing a *theory of therapy* for

children who have DLDs. This theory, it was proposed, has *multiple components*: developmental knowledge; established models or principles of therapy; the context and location of therapy delivery; and the person who delivers the therapy. Using their 'theory of therapy', SLTs' tacit knowledge of practice impacted on how they viewed the child's communication needs, which in turn affected their actions in planning and delivering therapy to resolve the difficulties. One aspect of tacit knowledge, pertinent to the current study, was identified in descriptions of therapy activities for this group; that is, the difference between skill acquisition and metacognitive activities. This study was therefore successful in making explicit a theory of therapy that SLTs could not articulate and in identifying that theories of deficit are an important part of the decision-making process.

2.1.3   Therapy principles derived from a theory of development

Developmental norms are considered to form the basis of setting and evaluating therapy goals when the SLT uses assessment findings and theories of typical development to set a goal that is within the child's capacity to learn with targeted assistance (Paul & Norbury, 2012). This means of arriving at therapy goals uses the concept of the zone of proximal development (ZPD) (Vygotsky, 1987).The ZPD is the difference between the child's current level of functioning and the next developmental step that can be reached with support. Therapy goals within the ZPD are an effective use of therapist's time; skills outside the zone will be too difficult to achieve even with support; and skills the child has almost mastered will in all probability continue to develop unaided. The probable range therefore, of the ZPD is identified by comparing assessment data with knowledge of typical development stages.

Intervention plans are then arrived at by hypothesizing the route to the next developmentally appropriate set of skills expressed as the targets, activities, contexts, and agents of intervention. The importance of theories of typical development in SLT practice can be seen across differing aspects of LI: grammar e.g. (Fey, Cleave, Long, & Hughes, 1993), phonological disorders (Dodd, 2013) and approaches to facilitation of language in late talking toddlers (Poll, 2011; Rescorla & Dale, 2013).

Adams (2005) applied similar principles in her early description of the SCIP manual content and rationale which aimed at providing intervention on aspects of high-level language,

social communication and pragmatics. Adams argued that pragmatics is only one aspect of social communication proficiency and that other areas of linguistic and cognitive development should be considered in efforts to understand and manage the deficit in SCDs. This model of therapy coincided with Perkins' (2007) position that social communication is the product of interaction across linguistic and non-linguistic domains. Perkins presented an "emergentist model" of pragmatics which states that competence requires the integration of cognitive, sensory, motor and semiotic abilities, and that disorder arises from an interruption to any of these systems in the course of development (Perkins, 2007).

Therapy goals in the SCIP method, if based on theories of typical development should therefore, argued Adams (2005), be derived from developmental sequences of emergence of skills in pragmatics. However, since the emergence of pragmatic ability in typical development is poorly understood (Adams, 2002), it is evident that the SCIP method, is only partially supported by available knowledge of developmental sequences.

2.1.4 Therapy principles derived from established methods of intervention

Fujiki & Brinton (2009) report principles of intervention for children with SCD from a review of their substantial body of work in developing therapy approaches and measuring outcomes for children with LI and social interaction difficulties (e.g. (Brinton et al., 2005; Brinton, Robinson, & Fujiki, 2004)). The following recommendations were made: individualised therapy plans; language skill and social behaviour targeted simultaneously; therapy delivered within a social context; delivered directly to the child in one-to-one or small group sessions and environmental modifications made to enhance the child's interactions with family and peers to support generalisation (Fujiki & Brinton, 2009).

Close examinations of case studies can provide guidance for feasible implementation not usually available in the literature on effectiveness (McCurtin & Roddam, 2012). As a stand-alone review of one team's SLT practice, Fujiki & Brinton do not cover all aspects of therapy content and delivery. However, as one means of describing a theory of therapy for a particular population, it is a welcome addition to the evidence base. These authors' review of practice may be considered to be a report on the internal evidence base in SLT. Internal

evidence is knowledge about practice *and* the critically appraised external evidence base (Dollaghan, 2007).

The study by Law et al. (2008) and the examples of theories of therapy provided for children with PLI reported above show that there are common elements in how therapy has been conceptualised for this population. A range of elements has been reported that can be aggregated and explored to understand their purpose and influence on planning, delivery and outcomes. In terms of therapy content, therapeutic goals are derived from reference to known deficits and skills in the impaired and typically developing populations. A theory of therapy would be able to demonstrate how these elements relate to one another and how they might be conceptualised together in a model that is both comprehensive and detailed in its specification for practice. One such model has been developed (Fey, 1986; McCauley & Fey, 2006) and has been used to design a framework to report on the theory and practice of established therapy programmes.

2.1.5 A structural model of therapy (McCauley & Fey 2006)

The structural model produced by McCauley & Fey (2006) was intended to describe intervention components that "must be addressed explicitly or implicitly in the development of a language intervention approach" (McCauley & Fey 2006 p. 5). The model is conceived around a central point of the Basic goals of therapy. Basic goals are, as the name suggests, the general areas of impairment that will be addressed in therapy. Fey (1986) provided two further levels of specification for therapy goals: intermediate and specific. Intermediate goals clarify the Basic goals by identifying more closely the language and communication skills and knowledge that need to be taught to make progress to the Basic goals. Intermediate goals are representative of the clinician's perspective of how skills mastered early in the intervention period provide the foundation for other, later-developing, more complex or related skills to emerge. These goals represent the SLT's theory of language impairment and the areas of development that have been prioritised. Activities are developed from the specific goal in order to provide the optimum conditions for learning. Activities provide the contexts in which learning takes place and where therapeutic procedures are implemented to achieve progress. Therapy activities make the targeted language skill prominent so that the child can learn by providing many opportunities to hear and use that particular communication skill. McCauley & Fey's (2006) structural model is reproduced in Figure 2 below.

Figure 2: The multidimensionality of intervention (McCauley & Fey 2006)
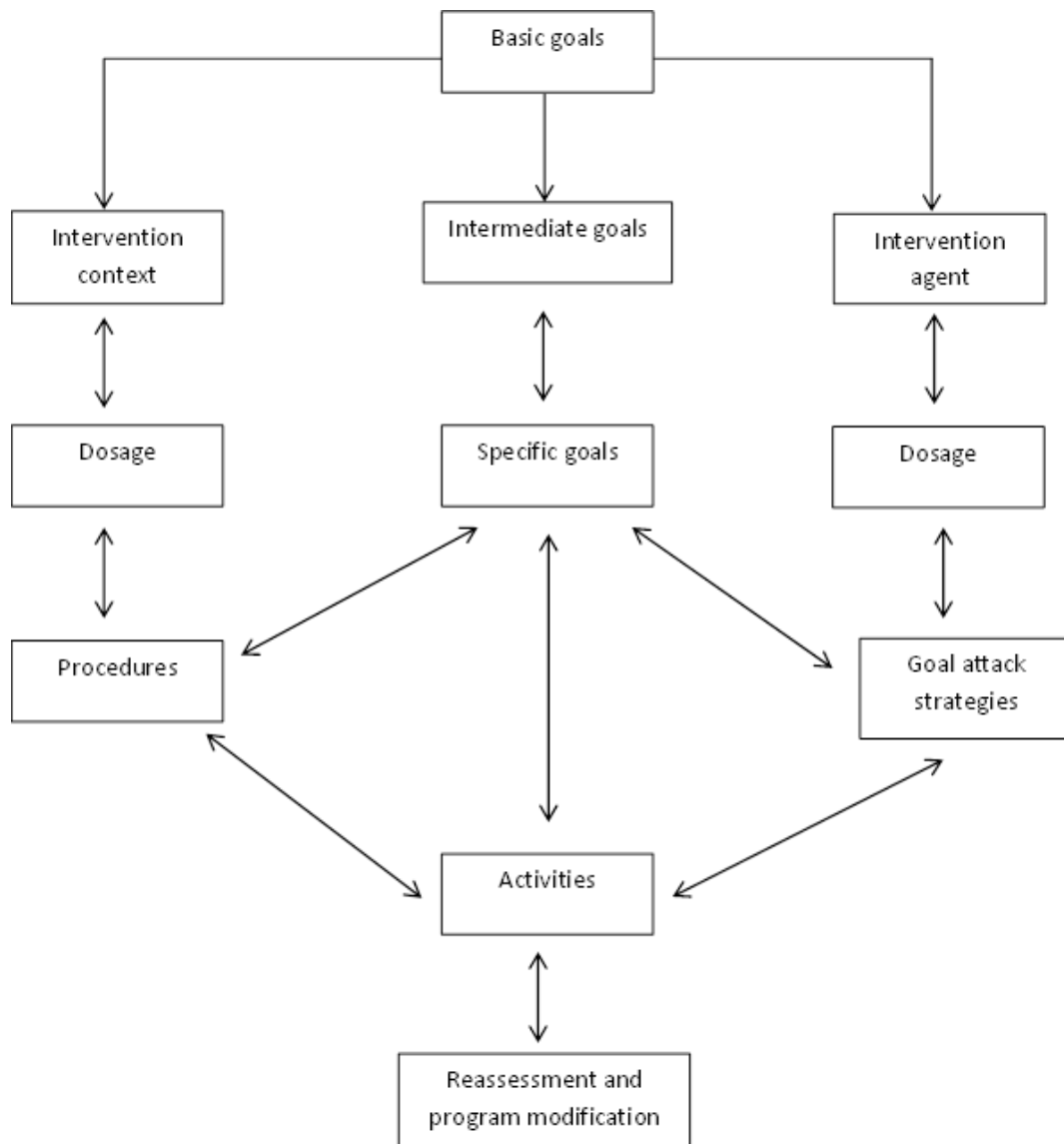
In the structural model, therapy procedures are all the clinical actions that help the child to learn. They include describing and modelling the target skill, creating practice opportunities, providing feedback on the child's performance and reinforcement of correct attempts. Therapy procedures guide the child to the target skill by using activities to achieve therapy goals while taking account of the child's preferences for learning. Intervention agents are the people who engage with the child with the explicit purpose of teaching specific goals. The context in which learning takes place means not only the

physical location of treatment sessions, e.g., classrooms, homes, clinics, but also the social value of the context to the therapy goals.

This model offers a comprehensive structure and description within which therapy content and delivery has been explicitly set out and from which individual components can be examined. The structural model has potential to describe a wide range of interventions and to support the development of treatment manuals, for example, to be used in clinical trials. It is interesting to note, however, that even at this level of specific modelling of components of therapy that McCauley & Fey asked authors of intervention programs to contribute a case study and a video recording of the therapy being enacted. Getting at the tacit knowledge of how practice operates, even practice that has been so carefully described, is clearly still a challenge for the SLT profession.

Although comprehensive in its structure and description of therapy components, there is one element in therapy not made explicit by this model but which is observable in descriptions of intermediate and sub-goals for therapy and in SLT procedures. In an earlier version of this model, specifically focused on a theory and model of therapy for pre-school children, Fey (1986) argued that the type of reinforcement and feedback provided by the SLT are influenced by the therapist's underlying theory of how children learn. He also claimed that the underlying learning theory adopted by the clinician, which may be unconscious, also influences therapy goals.

Fey's concern in presenting learning theories as part of the theory of therapy was that an unconscious adherence to one particular learning theory may preclude consideration of a sufficiently broad set of therapy methods (Fey 1986). He argued that SLTs must be aware of underlying learning theory and the impact it has on the principles and practice of therapy delivery.

In summary, both the structure of therapy (and its components) and the learning theory associated with the model, are, according to Fey, aspects of the SLT's theory of therapy. Law et al. (2008), Adams (2005) and Fujiki & Brinton (2009) have indicated that a theory of therapy is tacit, complex and multi-faceted. The models that have been presented have tended to concentrate on knowledge of impairments and development or on procedural aspects of therapy planning, that is, they do not necessarily represent the process of therapy. The final aspect of a possible theory of therapy is the SLT's interaction with the task and the client. This is presented in the next section.

2.1.6 An interactive model of therapy

A model of therapy practice for adults with communication difficulties provides both an attempt to explain the SLT's interaction with the task and the client in order to keep the task at an appropriate level, and a hypothesised mechanism of change related to metacognition (Byng & Black, 1995).

In a parallel study to that of Law et al. (2008), Byng & Black (1995) examined the components of intervention across a number of studies of adults with acquired aphasia. Their review and subsequent analysis found that SLTs used different therapy approaches for adults with the same aphasic impairment. Byng & Black conceptualised that therapy had both a form and a process. The form of therapy is made up of goals, tasks and materials and is derived from an assessment of the language-impaired individual's strengths and needs. The process of therapy is the way that the SLT controls the therapeutic tasks, materials and her/his own interaction with the individual to manage progress towards the therapy goals.

An examination of the interaction between the SLT and the client showed that the therapist's role during therapy is to keep matching the task to the individual's processing capacity in line with the goals of therapy. This might mean that task materials are adjusted, added or removed from the task as therapy proceeds. Byng and Black concluded that the reported mechanism of change in studies of aphasia therapy was making explicit to the client the cognitive and linguistic processes required for understanding and creating sentences. Clients were engaged in "facilitated problem-solving" interactions with the therapist that enabled them to use "linguistic and conceptual knowledge in certain limited or specified ways" (Byng & Black 1995 p. 312).

From a comparison of three intervention studies, Byng & Black (1995) provided the basis for an interactive model of SLT where the SLT interacts with the task (and materials) and the client to achieve the goals of therapy. They showed that tasks were designed to present clients with the opportunity to practise the target skill and to correct their errors. In this way, tasks were used to develop linguistic skill and problem-solving and self-monitoring skills. Tasks became more complex as therapy proceeded. Therapist response was contingent with client performance and was related to the task design; different tasks required different amounts and types of comment from the SLT to achieve the therapy goal.

Byng & Black's analysis provided a useful model to understand and make explicit some aspects of the therapy process and like Law et al. (2008) they found that the SLTs' description of the impairment was closely linked to the goals for therapy. Byng & Black acknowledged that tasks were under-specified in the case studies examined, both in terms of what the therapy task was and what was required of the client to complete it. Furthermore, they note that only one study explicitly reported the processing demands of the task in terms that reflected the cognitive and linguistic processing required to complete it. This may be a feature of the data. Byng & Black's data in this regard were incomplete and lacked the detail to make confident, unbiased claims about the processing demands of therapy tasks. This implies that complete, rich and interactive data based on real therapeutic interactions are more likely to provide accurate accounts of the processes involved in therapy, far more than retrospective accounts can do. Byng & Black's data suggest that the SLT has a role in changing how the task is presented to the client, which alters complexity. Further examination of the interaction of SLT with the task's cognitive and metacognitive demands would assist in identifying what SLTs in the Law et al. study stated as the factor that impacts on effectiveness of therapy delivery.

2.1.7   Summary of models and theories of therapy

The literature reviewed so far exemplifies how researchers have attempted to break down the SLT therapeutic process (across populations) into its constituent parts. Law et al. (2008) examined SLTs' rationales for their practice; Adams (2005) focused on a model of development of social communication in typical children; and Fujiki & Brinton (2009) derived specified clinical actions and therapy goals from expert practice. The contribution of McCauley & Fey (2006) has been exceptional in the field by providing a comprehensive model of the components of therapy practice. By identifying therapeutic form and process, Byng and Black (1995) provided both the vocabulary to define constituent parts of therapy and to explain how they combine in the delivery of therapy. Having hypothesised that the main source of change in therapy lies in the interaction between the SLT and the client, they claimed that the complexity of the intervention lies to a large extent in the nature of the interaction between the therapist, the client and adjustments to the task to teach skills and promote self-monitoring.

There has been no parallel attempt until now to examine the role of metacognition in SLT form and process in child-directed therapy in an analysis similar to that of Byng and Black. There exists, therefore, a gap in knowledge about the role of metacognition in therapy for children with DLDs. How do experienced therapists choose the form of therapy and manipulate the process of therapy towards the achievement of agreed goals? It is this process of therapy that this thesis aims to illuminate with children who have PLI within the context of SCIP intervention by focusing on the role of metacognition as a common reported ingredient of intervention for children who have DLDs (Law et al. 2008).

2.2 Metacognition

The study of metacognition has spanned both the theoretical aspects of it as a human phenomenon and its application in educational settings (Hacker, Dunlosky, & Graesser, 1998; Veenman, Van Hout-Wolters, & Afflerbach, 2006). Metacognition is an important and active area for researchers and has been studied in a wide range of disciplines but it lacks coherence as a research topic (Perfect & Schwartz, 2002; Veenman et al., 2006). No agreed definition of metacognition exists partly because the aims of individual studies and the broad array of disciplines within which it has been studied have skewed terminology and definitions (Veenman et al., 2006). As such there is potential for confusion and overlap in its use in the literature. In response to this, Veenman et al. advocated a contemporary conceptualisation of metacognition as the interaction of metacognitive knowledge and skills.

Given that metacognition has been studied and defined so widely, the original definition proposed by Flavell (1979) is commonly cited as an umbrella term around which researchers define the term for their own purposes. In this thesis, metacognition is defined as the knowledge one has about one's own thinking processes, and the skill one has in being able to monitor and control one's own knowledge and thinking processes (Hacker et al., 1998; Veenman, 2006; Perfect & Schwartz, 2002). This part of the literature review will present information and critique on classic models of metacognition, modelling of person, task and strategy knowledge as central concepts in metacognition and the development of metacognition in children with both typical and atypical language development. It ends with a review of the use of metacognition in therapy for children with DLDs and remediation of reading difficulties.

2.2.1 A model of metacognition and cognitive monitoring: Flavell (1979)

Flavell proposed that metacognition can be understood through the ideas of metacognitive knowledge and metacognitive experiences (Flavell, 1979). Metacognitive knowledge is made up of person, task and strategy knowledge, that is, the knowledge one holds about one's own learning, the design and demands of tasks and knowledge of how to select and apply the right strategy to succeed. Metacognitive experiences are concerned with self-monitoring and are said to occur when there is heightened awareness of learning. A metacognitive experience occurs when a person reflects on their actions and how successful these actions are (or were) in reaching the goal(s) of their enterprise. That is, metacognitive monitoring occurs when a person thinks about their metacognitive person, task and strategy knowledge.

2.2.1.1 *Person, Task and Strategy knowledge*
Metacognitive knowledge is knowledge about the *person,* the *task* and the *strategies* employed to complete the task. Flavell proposed that these interact with each other in the process of learning. Metacognitive 'person' knowledge is concerned with insights or beliefs about how one learns best, about other people's learning and ideas and beliefs about learning in general. Person knowledge permits one to think about what one knows and to make judgements about one's own and others' strengths and weaknesses. Person knowledge also includes recognising when oneself and others have failed to understand, and how much information, if any, has been understood. Task knowledge is insight into the cognitive demands of a task, gauging the amount of time and effort required to complete it and understanding the desired outcomes or goals of that task. Task knowledge also allows people to judge a task on how familiar it is, how clearly it is presented and whether or not they find it interesting. Metacognitive strategy knowledge is an understanding of what strategies one knows how to use and being able to judge their relevance and effectiveness on a particular task.

Metacognitive monitoring can be of oneself and / or others' person, task and strategy knowledge. Monitoring requires that individuals know the goals of the task they are engaged in, knows what actions or strategies they are using to complete the task and has insight into how successful they are in meeting the goals (Flavell 1979). The more complex or unfamiliar a task is, the more likely it is to require self-monitoring and to stimulate metacognitive monitoring of person, task and strategy knowledge. Metacognitive experiences can be deliberately provoked in tasks set up to develop self-monitoring and

problem-solving. Knowledge arising from these experiences supports the individual to make changes to strategy use or task goals to make the activity achievable.

2.2.1.2   Limitations of the Flavell model

Flavell's work is of a seminal nature and has dominated the field of metacognition for over four decades. However, there are several aspects of Flavell's model that require further explanation and research. Firstly, the model is necessarily speculative and based on abstraction of information rather than experimental evidence. Its value in this thesis is to provide a model of the complex metacognitive components in therapy, including monitoring and control. Certain features of the Flavell model have subsequently been challenged. For example, Flavell's model presents metacognition as the product of metacognitive knowledge and metacognitive experiences, the latter being responsible for both monitoring and controlling the individual's actions in any given project. However, Nelson and Narens (1990) presented monitoring and control as separate but inter-related functions of metacognitive processing. Thus, in contrast to Flavell's static model, metacognition is depicted as a flow of information between the "object level" (where the cognitive actions are taken) and the "meta level" (which monitors and controls the object level) (Nelson & Narens, 1990). The purpose of the meta level is to change the actions at the object level, that is, to initiate a new action, continue with an action or stop an action in response to one's reflections on those actions. Flavell described these levels of processing as cognitive and metacognitive, but did not propose distinct roles for the meta level processing. In contrast to Flavell, Nelson and Narens' (1990) conceptualisation of metacognition has been tested extensively in memory research, a review of which is beyond the scope of this thesis.

2.2.1.3   Definition of metacognition in the current study

The definition of metacognition adopted for this study comes from the work of Flavell (1979) and from Veenman et al.'s (2006) review of metacognition research. Veenman et al. argued that metacognition is currently understood to be the product of metacognitive *knowledge* and metacognitive *skill* in monitoring this knowledge and controlling one's use of strategies to make progress on a given task. Flavell conceptualised metacognitive knowledge as knowledge of the person, task and strategy characteristics in any specific cognitive activity. Metacognition is therefore defined for this thesis as being made up of one's metacognitive knowledge of person, task and strategy variables and the ability to monitor and control these variables in pursuit of success on a given task. This distinction between metacognitive knowledge and metacognitive skill is maintained throughout the

rest of this thesis.   For clarity, the interactions between components of metacognition are depicted in Figure 3, which shows the interplay between metacognitive knowledge and experiences (Schneider, 2010).

Figure 3: Interplay between elements described in Flavell's (1979) model of cognitive monitoring
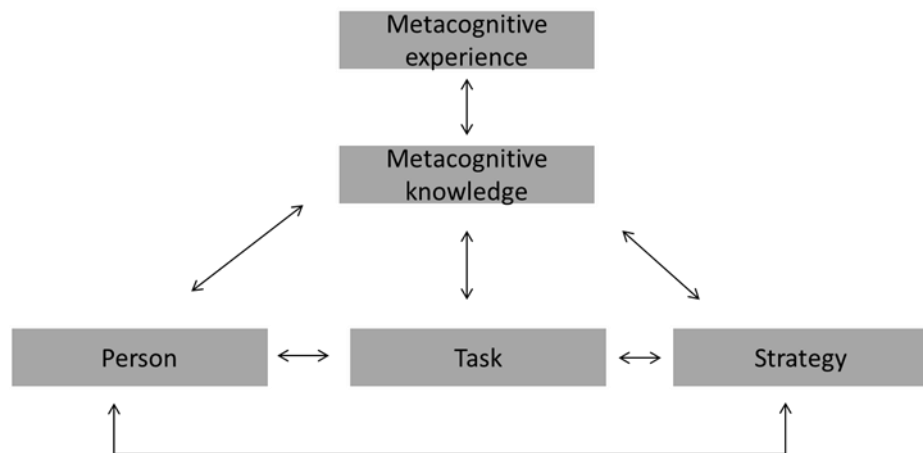
2.2.2   Metacognition in childhood

In this section, the literature on metacognitive knowledge is reviewed with respect to children's understanding of and ability to talk about tasks, strategies and their own knowledge and learning. This is followed by a review of studies examining the ways in which children have been found to monitor and control their metacognitive knowledge.

2.2.2.1   Metacognitive knowledge in children with typical language development
Lockl & Schneider (2006) carried out a longitudinal study of metacognitive knowledge development, task knowledge and mental state vocabulary knowledge of 168 children at six-month intervals between the ages of 4 years 6 months and 6 years old, using a battery of experimental tasks. Metacognitive knowledge was elicited using hypothesised scenarios in which children were asked to suggest strategies to remember something, to find something they had lost and to explain why the chosen strategy would be effective. Lockl & Schneider assessed task knowledge using scenarios in which two children, child A and child B, had tasks to complete that varied in terms of the task design and/or demands. Children were asked to evaluate whether child A would find the task easier, harder or the same as

child B and give their reasons. In addition, mental state vocabulary knowledge was assessed using a set of twelve mental state verbs: *know, guess, remember, forget, wonder, figure out, explain, understand, learn, teach, predict* and *deny*. Pictures and scripts describing a specific scenario were presented and children were asked to choose the verb that best described the picture from a choice of two. Additional variables of theory of mind and language measures were assessed at baseline. In addition to studying developmental patterns of metacognitive development, Lockl and Schneider hypothesised that theory of mind was necessary for the development of mental state verbs and that these preceded a child's development of metacognitive knowledge of person, task and strategy variables.

The findings of this study indicated that children's understanding of mental state verbs increased significantly between the ages of 5 and 6 years old (Lockl & Schneider, 2006). Five year olds understood the verbs: *explain, remember, learn and teach*, and by age 6 years they also understood *know, figure out, wonder, forget, and guess*. Only very few 6 year olds understood *predict, understand,* and *deny*. Metacognitive knowledge of task design and demands was present in children aged 5 years old but it was not until they were 6 years old that they could give justifications for their reasoning. Development of children's strategy knowledge increased significantly between the ages of 4 and 6 years old but was found to lag behind metacognitive person and task knowledge. By age 6 years some children were beginning to generate appropriate strategies and explain their utility, but the majority had limited strategy knowledge for hypothetical tasks (Lockl & Schneider 2006).

Another longitudinal study of metacognitive development, this time involving 196 children between the ages of 6 and 9 years of age, was carried out by Annevirta & Vauras (2001). Children's understanding of the relationships between person, task and strategy variables was assessed at yearly intervals using hypothesised scenarios (adapted for older children) similar to those of Lockl & Schneider's (2006) study. Annevirta & Vauras carried out an analysis of the children's justifications for their reasoning about person, task and strategy knowledge within the task. The findings from this study reflected the pattern found by Lockl & Schneider for younger children: that children's metacognitive knowledge and ability to explain their thinking improved significantly with age. Both studies suggest that task demands are well understood at six years of age. Annevirta & Vauras found that children understood the impact on success of available study time, the number of items, the familiarity of the task and the person's age. With regard to person knowledge, 6 year-olds understood the role of prior real life experience in understanding a task and how

distraction affects concentration. As children got older, they understood the importance of prior knowledge of a task and its impact on success but many failed to be able to explain why activating prior knowledge would be helpful (Annevirta & Vauras, 2001).

Like Lockl & Schneider (2006), Annevirta and Vauras also found strategy knowledge to be relatively underdeveloped in comparison to task and person knowledge. Results show that almost all 6 year olds could select the most effective strategy for tasks. By eight years of age children knew that watching someone, copying and rehearsing helped them to learn and succeed on tasks. Children's ability to give reasons for their choice of strategy improved considerably between the age of eight and nine years of age, but knowledge and explanations of complex strategies such as categorisation to aid memory or asking for explanations of steps to do a task were understood by only very few nine year olds.

Overall, results from both studies report that children's understanding of metacognition is in advance of their ability to explain their knowledge and that as children get older they can make more explicit reference to mental processes relating to the task and the person doing the task. However, both studies employed tasks in which it is not immediately evident which aspect of metacognition is being studied and there may be a significant impact of task on children's abilities to interpret or express metacognitive skill (Schraw, 2009). The assessments used by both Lockl & Schneider (2006) and Annevirta & Vauras (2001) required the children to report verbally on hypothetical tasks and strategies. Neither study, however, was consistent in assessing whether participants could express what they know and whether their reports accurately reflect actual competence. Annevirta & Vauras (2001) found considerable individual differences in performance across both tasks at each time-point and explained this, without adequate justification, as indicating that there are groups of children whose metacognitive explanations developed and those whose did not. This claim appears to be somewhat arbitrary and requires justification from further research in which appropriate predictive variables (e.g., expressive language skills) are measured at the outset. This is especially important in light of Lockl & Schneider's finding that growth in language ability was correlated with children's metacognitive knowledge. The conclusion is that assessment of metacognition needs to take account of children's expressive language skills.

2.2.2.2 *Metacognitive monitoring and control skills in children with typical language development*

Metacognitive *monitoring* is defined as the state of being aware of one's mental processes while metacognitive *control* is taking action to ensure that one can succeed on a task

(Lyons & Ghetti, 2010). The relationship between metacognitive monitoring and control has not been established but it is assumed that monitoring precedes control in childhood (Lyons & Ghetti, 2010). Studies of metacognition in childhood rarely separate these elements and this section reports on studies that have assessed children's ability to monitor and control their person, task and strategy knowledge.

Error detection tasks have been used to assess children's comprehension monitoring skills from pre-school to secondary school age. Skarakis-Doyle (2002) used the principle of expectation violation to determine the comprehension monitoring skills of pre-school children. Children aged 2 years 6 months to 3 years 11 months were exposed to a story for a week before being read the same story with deliberate errors. The sabotaged task was video-recorded. Analysis revealed that around three years of age children showed their awareness of the error non-verbally by smiling, looking at the reader or by showing a puzzled facial expression. More than half of the children from across the age range also made verbal comments on hearing the errors to reject the error or correct it, that is, they also attempted to use metacognitive control processes to correct their understanding (Skarakis-Doyle, 2002).

Comprehension monitoring of school-aged children was assessed in a study using written texts with embedded implicit and explicit errors (Markman, 1979). Children aged between eight and eleven years were asked to judge the comprehensibility of essays and give feedback to the researcher on how the essays could be improved. Essays had either an implicit error requiring inferences to detect and correct the error, or an explicitly stated contradiction to an earlier piece of information. In this study, explicit inconsistencies were noted by only half of the students and almost all students missed implicit errors. In subsequent research, the task was adapted so that different students (aged eight to twelve years) were allocated to one of two conditions; half of these students were told to expect errors and were instructed to read the texts aloud. Results showed that younger children are less able to detect explicit and implicit errors even when they are instructed to do so. Older children were found to improve their ability to detect implicit and explicit errors when they were informed of the existence of errors and had read the texts aloud (Markman 1979).

Skarakis-Doyle (2002) and Markman (1979) are examples of children being required to monitor person and task knowledge. In the task used by Skarakis-Doyle (2002), young children developed expectations of the task through repeated exposure to the story that

assisted them in being able to identify inconsistencies contrary to these expectations. The children in this study were *monitoring* what they knew about the task (the story) and how what the adult said in delivering the task matched what they knew. They signalled their monitoring of these metacognitive variables non-verbally but only those children with sufficient expressive language skills attempted to correct the error verbally. In the Markman (1979) study, older children were obliged to use metacognitive person and task knowledge to first monitor whether they understood the text and then monitor the task materials for internal consistency with what they had (or had not) understood. Correction of errors required metacognitive task knowledge to comment on the task design. Children's expectations of the tasks influenced whether or not they spontaneously recognised and reacted to errors suggesting that monitoring of task variables can be provoked for positive effect by informing students that errors are included.

Both Skarakis-Doyle and Markman's studies employed materials designed to appeal to the specific age range of participants. As has been discussed with reference to Lockl & Schneider's work, the construction of the metacognitive task is crucial to the detection of developmental patterns and age-related behaviours. Children demonstrated a range of ability within both Skarakis-Doyle and Markman's studies indicating that the experimental tasks had sufficient spread of difficulty to detect differences across conditions. Furthermore, the use of sabotage or error-detection appeared to have contained a motivational and fun aspect for the children. However, the findings are based on information from disparate paradigms, one with very young children's stories and the other based on more advanced written material. Therefore it is difficult to bring together more than the conclusion that error-detection tasks can be useful as a means of assessing comprehension monitoring and that children from three years can perform these tasks. Children may show that they have not understood in fairly subtle ways in the early years but are more likely to use explicit repair strategies to increase understanding as they get older.

One of the criticisms of this research is the contrived nature of the experimental paradigm (Schraw 2009). Further research studies have used systematic observational measures of metacognitive skills during children's naturalistic play. In a large scale study of metacognition Whitebread et al., (2009) trained sixteen pre-school teachers to promote metacognitive skills of planning, monitoring and control with children aged 3 to 5 years. Children were video-recorded in solitary play and in play with peers or teachers and video

footage was analysed to develop an observational checklist of metacognitive knowledge, skill, motivation and emotional regulation displayed during these activities (Whitebread, Coltman, Pasternak, Sangster, Grau et al. 2009).

Findings revealed actions relating to metacognitive *knowledge* and *skill* in how the children were observed to plan, monitor and evaluate their actions in play (Whitebread et al., 2005; Whitebread et al., 2009). Pre-school children showed that they could resist distractions to complete a task and monitor their comprehension. Children reacted to failure in completing tasks by asking for help or changing their approach. Some children under four years of age could verbally explain their thinking processes. Monitoring and control of task and strategy knowledge were demonstrated when strategies learned in one activity were used appropriately in another and when children described the actions needed to complete a task (Whitebread et al. 2009). Development across time was noted for all children; those with the lowest metacognitive scores at baseline made the most progress.

By observing play rather than interviewing children to report on their behaviours, this pair of studies provides convincing evidence of the growth of metacognitive monitoring and control in the pre-school years. Furthermore, it showed that these skills can be enhanced by relatively simple instruction and environmental modifications. The method of data recording and analysis used by Whitebread and colleagues, systematic observation, has been frequently used to quantify previously specified behaviours in naturally occurring interactions (Bakeman & Gottman, 1997). The checklist developed by Whitebread et al. was initially developed from a literature review of metacognition. Key concepts were listed and used by teachers to make observations of children at play. In a series of discussions between researchers and teachers on observations taken at three time-points the content was verified. Inter-rater reliability measures were acceptable. This is important in that it shows how the content of the coding scheme was adjusted in line with teachers' observations and so has ecological validity as well as inter-rater reliability.

In summary, children's metacognitive knowledge and skills develop alongside each other, showing emergence at around three years and continue to develop into adolescence (Veenman et al., 2006). Children learn words to talk about their mental states and can make judgements about features of tasks that would make them easier or harder to complete. Children can select effective strategies for particular tasks when offered a choice or when they have received training to recognise the impact of the strategy on their performance. The development of metacognition has largely not been studied in relation to

other aspects of development, although this is beginning to change. Findings support the view that theory of mind, executive functions and language ability are important other skills for metacognitive knowledge and skills to develop. This raises the question of how children who have DLDs, especially where language is severely affected, develop adequate metacognitive skills or are able to participate in metacognitive activities in therapy.

2.2.2.3   *Metacognition in children with language impairments*

In a follow-up study to her earlier work with typical children, Skarakis-Doyle studied the ability of children with language impairment (LI)[3] (N=10) to detect and correct errors in a verbal task (Skarakis-Doyle & Dempsey, 2008). Children with LI detected fewer errors than their typically developing peers (both age- and language-matched) and did not attempt correction. Only half of the children with LI signalled error-detection, and these were almost exclusively non-verbal recognitions of the error. Findings suggest that error detection tasks of this kind, which are thought to reflect underlying metacognitive or at least metalinguistic competence, are disproportionately difficult for children who have language impairments - since they performed more poorly than language matched peers. Additional analysis indicated that receptive vocabulary scores and non-verbal IQ did not account for all of the variance observed in error-detection in the LI group's performance.

This was a well-controlled study with adequate matching and satisfactory inter-rater reliability for coding of errors. Subject numbers are small, however and little detail is provided about the exact nature of the language impairments, so any analogy to children with PLI is not possible. It is well established that children with LI have difficulty in making inferences from discourse (Ford & Milosky, 2003, 2008) and children with ASD have difficulties in narrative comprehension (Norbury & Bishop 2003; Norbury et al., 2014). It would be important to have an understanding of the intended meaning of the text in order to detect inconsistencies. All children in the Skarakis-Doyle & Dempsey study had knowledge of the vocabulary when presented in a pre-test as single items and the story content was based around familiar routines. However, there is a possibility that weak representation of the story script may mean that not enough processing capacity is available to carry out the meta-task in parallel with basic decoding of word meanings and syntax. That is, there may be an issue of processing capacity rather than a lack/absence of metacognitive skill.

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[3] Language Impairment or Specific Language Impairment is defined as a persistent difficulty with the development of language that is unexplained by any obvious factor (Schwartz, 2009). It differs from PLI in that children with LI have weak but not disproportionate difficulty with pragmatics.

2.2.3 Training metacognitive knowledge and skills with children who have language impairments

Training children to use and monitor their use of strategies for learning or interaction requires that they know what strategies are available to them, how to enact each one and also that they discriminate between strategies by evaluating the effects and then selecting the most effective (Veenman et al., 2006). Metacognitive training explains each of these steps to children by teaching them the WWW&H rule, i.e., 'the what, when, why and how rule' (Veenman et al., 2006). Training of metacognitive skills for children who have LI or ASD is a common activity in intervention (Law et al., 2008) yet there is little evidence as to its effectiveness. The evidence base for metacognitive training in SLT has largely been populated by case studies. These studies are reviewed below using the WWW&H rule as a framework to exemplify how SLT targets can be developed to focus on not just the learning of strategies but also on the evaluation and implementation of them.

Timler et al. (2005) presented the case of a girl aged 9 years 8 months with social communication disorder (SCD) (see definition in 1.3.1) and delayed language skills. Intervention (delivered twice a week for six weeks) was aimed at: being able to state a social problem from both 'self' and 'other' perspectives; generating a range of possible strategies to solve the problem; selecting and enacting the best strategy in role play; and evaluating the consequences of the strategy (Timler, Olswang, & Coggins, 2005). Intervention consisted of teaching vocabulary to describe mental states and carry out problem-solving tasks in a range of social interaction scenarios supported by role-play and role reversal. The child was able to generate some problem-solving strategies during the intervention but remained reliant on a generic strategy and needed prompts to generate multiple appropriate strategies for each particular scenario. The child became able to use mental state verbs in her analysis of the problem and justification for her strategy, but her evaluation of the usefulness of the strategy remained egocentric.

In this study, Timler et al. attempted to teach specific problem-solving strategies to a child with limited language ability and use of mental state verbs, poor social interaction and limited insight into the feelings and needs of others. The intervention taught a range of strategies that could be used to solve problems in different social scenarios, that is, she was taught *what* to do. The visual checklist and role-play provided repeated practice to learn the steps in solving a social interaction problem, teaching *how* to use the strategy. Role-reversal provided the opportunity to take another's perspective. The scenarios provided

the details of when the problem occurred and *when* a strategy was needed. Teaching children *why* one strategy was more effective than another was achieved in two ways; the effect of both optimal and ineffective strategies were discussed and evaluated to show the contrast between them. The goal of this intervention - to develop her ability to generate, select, execute and evaluate a range of strategies for enhanced social interaction - was partially achieved and gains were supported by the teaching of mental state verbs. Generalisation of the ability to solve problems in actual social interactions was not assessed in this study, but was the focus of another case study from the same research group.

Timler et al., (2007) developed an intervention with a specific focus on generalisation and delivered this intervention to one four-year-old boy with SCD, in two settings: a withdrawal room in school with four typically developing peer tutors; and in free play in his pre-school classroom. The intervention goals were to teach the child to make on-topic comments about play with the wider aim that this would facilitate his participation with his peers. Intervention was delivered in three sessions per week over three weeks individually and in a small group. Intervention in the small group used role-play and a structured approach to prompting. Role-play provided the opportunity to comment on ongoing play and observe others making comments. The clinician delivered prompts as needed following a "system of least prompts" which ranged from no prompt to providing a direct model and telling the child to "tell your friend X" (Timler et al. 2007 p. 175). Findings were reported for generalisation from five independent observations of his free-play. Two measures were taken, the frequency of on-topic comments and the success of these in gaining entry to peer interactions. In general, there was an increase in the number of on-topic comments made, and two out of five of these were successful in facilitating joint play.

Although this study provides limited data on only one child, the method used to achieve this modest generalisation from a 'clinical' setting to the child's pre-school classroom is described in detail. This intervention method shows clearly how the *what* and *how* of a particular strategy were taught in ideal conditions, and that strategy knowledge of *why* and *when* it is important were taught in the setting where the child would have most opportunity and benefit from using the strategy. Timler et al. provide no explicit report of teaching the child *why* the strategy of on-topic comments will be useful for establishing peer interaction. It may be that as the child was previously watchful of his peers and became able to engage with them by using the strategy that there was an implicit assumption that the benefits of its use were understood by the child. Unlike the method in

Timler et al. (2005), no procedure is reported for reducing clinician support to develop self-monitoring skills or requests for help to use the strategy.

Dollaghan (1987) developed a comprehension monitoring program to teach children with LI how to monitor whether or not they have understood an instruction and if not to take action to enhance their understanding. The principles of this program rest on teaching the child to monitor the instructions before shaping the child's ability to control their understanding by asking for clarification. Therapy starts by manipulating message variables, for example, volume, vocabulary, rate etc., so that children can experience the different feelings associated with knowing and not knowing. Once the basic ability to detect an inadequate message has been achieved, messages that are faulty in more subtle ways are introduced. Throughout training, children are encouraged and praised for asking for clarification, which in Dollaghan's view develops motivation.

Dollaghan & Kaston (1986) tested the effectiveness of this intervention over fifteen short individual therapy sessions with four school-aged children with LI. Intervention commenced with training in active listening and error detection of very obvious interruptions to messages; later stages used progressively more subtle errors in instructions in games and role plays. At the end of the intervention period, all four children had increased their requests for clarification of inadequate messages and the effect was maintained. Children by that stage were able to query obvious or impossible instructions. Lengthy instructions containing vocabulary known by the child were harder for children to monitor and requests for clarification of these were less frequent (Dollaghan & Kaston, 1986).

Dollaghan's (1987) rationale and procedure for developing comprehension monitoring skills in children with LI was therefore found to have preliminary evidence of effect. From a metacognitive viewpoint, children in the Dollaghan & Kaston study were taught to *monitor* their understanding (person knowledge) in repeated practice with feedback and specific encouragement to detect breakdowns in messages (monitoring). Metacognitive *control* of person knowledge was taught by use of one main strategy to request clarification more and more precisely as therapy progressed. As proof of concept research, these were promising findings and it is surprising, given the promising findings from small-scale work, that this has not been extended to a larger trial, although this may have to be part of a more comprehensive intervention. Despite recommending generalisation through use of natural settings and adults in the child's environment (Dollaghan, 1987), Dollaghan & Kaston did not measure generalisation of metacognitive monitoring and control of person knowledge

in their experiment. Children were taught what, how and why of asking for clarification, but *when* this strategy is most useful, that is, in actual communication breakdowns, may not have been explicitly enough taught to enable children to use the strategy effectively when they most needed it.

The studies reviewed here by Dollaghan and Kaston (1986) and Timler et al. (2005, 2007) have provided insight into how children with LI and SCD can be taught to *monitor* and *control* their *person and strategy knowledge* when requesting clarification, solving social problems or joining peers in play. However, no specific intervention focus on teaching children to understand the *task* design and demands is included across the three studies. Research regarding task knowledge has largely taken place with respect to children with typical language development who require additional literacy instruction and this is discussed in the following section.

2.2.3.1   Teaching typically-developing children to monitor and control person, task and strategy knowledge: Reciprocal Teaching

Reciprocal Teaching (RT) was developed by Palincsar & Brown (1984) and is a set of teaching strategies for enhanced reading comprehension that makes explicit the metacognitive knowledge and skills required for success. The goals and methods used in RT are listed in Palincsar & Brown's paper and summarised in Table 3. In RT lessons, children read together in a small group with one supporting adult who models all strategies as each section of text is read and engages each student at the level he/she can participate. Strategy names are taught explicitly as are the steps to complete them. Images are used to describe goals for each task, for example, the summary of a story could be written on a 'doll's house book' (Palincsar & Brown 1984 p. 135). Children learn about task design and demands through explicit discussion of the text, for example that the title helps predict content and that information across paragraphs should be cohesive and congruent with the whole text (Palincsar & Brown, 1984).

The dialogue in RT is viewed as an essential component of its implementation (Hacker & Tennett, 2002; Rosenshine & Meister, 1994) and is exemplified in the original report (Palincsar & Brown 1984). The content of teacher-talk in RT is planned, systematic and focussed on the task and strategies being used as well as referring to the child's existing knowledge of the topic. That is, RT uses and develops metacognitive *person, task and strategy knowledge* and *skills of monitoring and control.*

Table 3: Principal goals and methods used in Reciprocal Teaching (Palincsar & Brown 1984)

Goals of Reciprocal Teaching	Methods of Reciprocal Teaching
Understand the purpose of the task	Modelling of comprehension monitoring and repair strategies in a genuine task
Activate relevant background knowledge	Repeated practice
Allocate attention to the task	Explicit discussion of strategies for each task; their effect and how they relate to the task
Evaluate incoming information for coherence and compatibility with prior knowledge	Role reversal and support for children to explain their thinking when in teacher role
Monitor on-going comprehension	Gradual passing of responsibility to the students to use the four key strategies
Use prior knowledge and information in the text to make predictions and draw inferences	

RT remains the most explicitly described method for developing reading comprehension strategies in school age students. A review of evidence for RT (Rosensheine & Meister 1994) found improved and generalised use of strategies for reading comprehension maintained over time and improvements on norm- and criterion-referenced comprehension tests. As a method it has been widely applied and adapted in line with the needs of each particular setting or study (Dignath & Büttner, 2008; Hacker & Tennett, 2002). Like Flavell's definition of metacognition, the work of Brown et al.(e.g. (Brown, 1997; Palincsar & Brown, 1984; Reeve & Brown, 1984)) has become embedded in the design of metacognitive training studies to develop reading comprehension and the training program, Reciprocal Teaching (RT) (Palincsar & Brown 1984), has been particularly influential.

This brief section on reciprocal teaching has reviewed a widely used intervention that focuses explicitly on teaching children to think about person, task and strategy variables, trains them to use strategies and to evaluate and control their use of strategies in line with the task. As such, it is a key applied example of Flavell's theory of metacognition. Interestingly, RT methods have much in common with SLT practice: modelling, role-reversal, feedback to explain steps and support for increasingly independent use of

strategies. It has parallels with the interpersonal intervention and interactive situations created whilst working with children who have DLDs. Hence its structure and methods may provide insight into ways in which these interactions could be studied.

2.2.4   Summary of metacognition section

Flavell's original conceptualisation of metacognition defined it as knowledge of the *person, task and strategy* characteristics in any specific cognitive activity. This definition has been extended by Veenman et al. (2006) to include metacognitive *knowledge,* metacognitive skill in *monitoring* this knowledge and in *control* of one's use of strategies. Studies of children's development of metacognitive knowledge have not used a consistent terminology that reflects Flavell's model or Veenman et al.'s review. However it has been established that children as young as three years can signal when they have not understood verbal messages/texts. Development of metacognitive knowledge of task design and demands is present in children aged five years but there is continued development across the elementary school years and into adolescence. Children with LIs have been found to lag behind younger children with typical language skills on error detection and comprehension monitoring tasks, implying that the use of metacognitive intervention strategies in SLT may not be straightforward. Further research is needed into the nature of metacognition in SLT with children who have DLDs and a careful adherence to theoretical models and terminology should be embedded in that research. Studies have typically employed experimental tasks or video recordings of interactions to detect metacognitive behaviours. However, there are no studies that demonstrate a method of analysis of metacognitive behaviours that occur during SLT intervention sessions as part of the ongoing therapeutic exchange. The third part of this literature review therefore evaluates which methodology is an appropriate choice for this purpose.

2.3   Review of potential methodologies to analyse interaction in Speech and Language Therapy

This section provides an overview of the methodologies suitable for the analysis of interaction in the delivery of SLT. In particular it systematically evaluates the merits of a set of methodologies for the analysis of metacognitive content in the therapy process

embedded in SCIP intervention with children who have PLI. The section focuses on three qualitative approaches to analysing interaction: conversational analysis, grounded theory and thematic analysis. The section concludes with a summary of the reviewed methods and a justification for the choice of thematic analysis for this exploratory study.

2.3.1 The Systematic Observation method: application to childhood communication disorders and speech and language therapy

Systematic Observation is a quantitative approach to analysing interactions. Behaviours expected to exist in the interaction are defined in advance and operationalized into a checklist that is used to record the number of times each behaviour is observed. Frequency counts of behaviours are subject to statistical analyses to report relationships between observed behaviours and to determine levels of inter-rater reliability (Bakeman & Gottman, 1997). Systematic observation lends itself to the study of interactions where the nature of the expected behaviours in a given interaction has been previously documented.

Within the field of childhood communication disorders, systematic observation has been used frequently in experimental studies to analyse interaction between children with LI and their parents (Law, Barnett, & Kot, 1999; Reading & Richie, 2007), measure outcomes (Allen & Marshall, 2011) and observe the functional impact of SCDs on children's peer relations (Gibson, Hussain, Holsgrove, Adams, & Green, 2011). However, the use of a prescribed coding scheme to carry out a frequency count of behaviours can prohibit the observation of other factors in the data set that may be relevant e.g., (Poon, Watson, Baranek, & Poe, 2012)

The nature of interaction in SLT interventions will vary according to the therapy goal, the child's response to the task, and his/her need for support in that task. Unless the coding scheme is extensive, systematic observation may fail to capture what is important in a given interaction. As a method, systematic observation is not suitable for new areas of investigation or as a means to explore how an interaction develops as a sequence of meaningful verbal exchanges, such as that which develops in the course of a SLT intervention session. The nature and content of interactions are more commonly examined through qualitative methodologies and these are reviewed below.

2.3.2 Qualitative analysis of interaction: Conversation Analysis

Conversation analysis (CA) seeks to understand social behaviour through the close examination of the sequences of verbal and non-verbal contributions within a conversation (Sacks, 1984). CA uses finely graded analysis and interpretation of these actions in talk, to uncover how people construct and contribute meaning in conversation (Drew, 2005). CA starts by preparing a detailed transcription of the talk including the words, pauses, overlaps, and sound qualities such as intonation or elongation of a sound.

Institutional talk such as that which occurs between health practitioners and their patients has been examined using CA (Cahill & Papageorgiou, 2007; Heritage, 2005). Within SLT, CA has identified differences between parents' and therapists' responses to children's errors in pronunciation and showed that therapist responses are more likely to result in improved second attempts (Gardner, 2004). Subsequently, Gardner (2006) developed a training programme for parents and SLT Assistants (SLTAs) in how to give information to the child about their incorrect attempts and help the child self-correct. Further, CA was able to demonstrate a positive effect of training SLTAs on the children's production of target sounds (Gardner, 2006).

There is documented potential therefore, for the output from CA of SLT intervention to be used as the basis of identifying specific clinical actions and intervention strategies, developing guidance and training and measuring the effect of that training on intervention outcome. Gardner's examination of the interaction in SLT intervention conforms to the expectations in CA that the analysis looks at what happens within a sequence of exchanges between the participants and assumes that the child utterance is related to the content of the therapist / parent utterance that preceded it. CA of therapy sessions is therefore suitable where the parameters of the investigation are known in advance, such as in Gardner's work, where the point of focus was on what actually happens at the turn boundary of an interaction between therapist and child that improves the child's speech attempts. CA provides the detailed focus on each utterance that can pinpoint small differences between the talk of the therapist and parent that would otherwise be difficult to detect. However, when exploration of the data for previously unreported insights is the goal, analysis using grounded theory may be a more appropriate option.

2.3.3 Grounded theory

Grounded theory is a qualitative method of analysis characterised by making detailed observations of naturally occurring behaviours with the purpose of creating a new 'grounded' theory based (exclusively) on those observations (Glaser & Strauss, 1967; Silverman, 2000). Grounded theory is an inductive approach to analysis in which the researcher creates concepts or themes directly from the data and looks for relationships between the concepts to explain the data. Analysis in grounded theory is driven by emerging findings and theoretical sampling; that is, new data samples are sought to further explore emerging themes in the existing data set. Analysis progresses in cycles of iterative analysis where findings from early stages of analysis guide the collection and analysis of data in the later stages of the study (Silverman, 2000). Grounded theory is developed without prior reference to existing theories and is mostly used in areas that are new or under-researched as a means of developing explanatory theories

The process by which themes are extracted from raw data in grounded theory is known as coding (Flick, 2002). Coding is described as the way in which data are "broken down, conceptualised, and put back together in new ways", and the way in which theories are developed (Flick 2002 p. 177). This definition of coding is considered by some to be too broad, encompassing as it does under one umbrella term, the different processes of labelling the raw data with a code, making constant comparisons of data across and within cases, reviewing and revising conceptualisations from categories and the further abstraction into theory.

Grounded theory, or principles of it, have been applied in SLT to examine, for example, service delivery issues, student learning and the social impact of LI (Skeat & Perry, 2008b). Adaptation of the method is common when research has aimed to describe themes rather than develop theory. In an exemplar paper, the same authors used grounded theory to examine how SLTs use outcome measurement in their practice (Skeat & Perry, 2008a). Their analysis produced an explanatory theory suggesting a relationship between SLTs' understanding of how the data will be used within their organisation and their adherence to the outcome measurement processes.

As a new area of research, the current study requires a means of examining the actual content of SLT intervention sessions to explore and report the possible presence of metacognition. The current study is not aiming to develop a theory of metacognition in SLT

practice. In addition, the current study is using an existing data set that is fixed, and while analysis may be able to identify aspects of other cases that may be of interest, no new data can be collected and so true theoretical sampling cannot be applied. At most, within the existing data set, it may be possible to purposively sample additional cases for analysis in line with emerging findings. Secondly, during analysis in grounded theory, the researcher is expected to set aside any existing preconceptions or prior knowledge of the data. In the current study, the researcher has extensive prior knowledge of the SCIP intervention content, implementation and outcomes that have shaped the research questions and design (see 1.4.1, 1.5 and 1.7).

There are principles of grounded theory that can be considered valuable in the current study such as carrying out an inductive analysis to stay grounded in the data and purposively sampling cases in response to early findings. However, the insights from parents and teachers reported by Baxendale et al. (2013) and recent claims that metacognition is an important but under-researched area of SLT (Law et al., 2008) suggest that the current exploratory research would benefit from use of previous research findings to guide exploration of the data set theoretically and purposefully. Thematic analysis, which aims to describe content in terms of themes rather than develop theory, is considered suitable for investigations where researchers have prior knowledge of the area under investigation and existing theory can be used to guide analysis through a process of deductive analysis. Thematic analysis is the focus of the following section and looks at both inductive and deductive approaches to thematic analysis.

2.3.4 Thematic analysis

Thematic analysis is a process of extracting succinct meaning from large amounts of usually text-based data, generally derived from interviews, focus groups or from transcripts of video or audio data as described by Silverman (2000). Silverman's account of thematic analysis construes it as largely an inductive process of making generalisations about the data from the data set itself. A deductive thematic analysis uses theory or previous research and experience to drive analysis by pre-selecting themes that may be present in the data. In both approaches, the data are subjected to repeated reading and summarising to develop the required level of familiarity with the data to make generalisations about them. The generalisations are reported as main themes. Themes are developed through interpretation of meaning in context and asking, "What is this about?" to gain a more

conceptual understanding of all of the data and are reported as the essential topic of the narrative. In general terms, thematic analysis comprises two main stages: coding and analysis (Silverman, 2000). Codes are developed for each part of the data to show what it means in relation to the research question and numerous codes will be generated in the early stages of analysis. Codes are grouped together in categories that share meaning. Categories are given names to represent their overall meaning. Familiarisation with the data is an essential component of thematic analysis and develops through coding and categorisation. Relationships within and between codes and categories are sought in a process of constant comparison and interpretation of how each relates to the overall data set and to the research questions. The goal of thematic analysis is to extract main themes and explain the wider meaning of the data. Increasing abstraction is achieved when the main themes are themselves further refined into one or two important points (Morse, 2008). The first stage can be considered data management, the second data analysis, even though analysis is considered to be present in every action taken with the data.

The aims of thematic analysis are generally clearly articulated; however, the process by which synthesis is achieved can be poorly specified. In qualitative methodologies, analysis has been described as being a "mix of creativity, systematic searching, inspiration and diligent detection" (Ritchie & Lewis, 2003 p. 199) and as requiring a "theoretical imagination" (Silverman, 2000 p. 119). Thematic analysis is considered by some as a process that underpins all qualitative research and therefore not a method in its own right (Boyatzis, 1998). The process of coding in thematic analysis is not the same as that reported in grounded theory by Flick (2002). In thematic analysis, coding tends to describe the actions taken to break the data down in the early stages of data management only. The core concept of constant comparison requires the specification of what is being compared, and terminology for both the processes and the output from those processes can be unclear in thematic analysis. A category is "a collection of similar data sorted into the same place"; a theme is the "essence that runs through the data" (Morse 2008 p. 727). Specifying the difference between these two outputs of thematic analysis permits the analyst to look for characteristics, patterns and common threads of meaning in and between categories which give rise to themes (Morse, 2008). Categories are sometimes called themes or potential themes (e.g., (Braun & Clarke, 2006; Ritchie & Lewis, 2003). Categorisation facilitates greater familiarisation and is a step towards thematic conceptualisation; it is not the end product (Morse, 2008). In recent years there have been attempts to make the means of categorisation and thematic conceptualisation more explicit by specifying

different actions and stages in the analytical process. Three examples of these models of thematic analysis are reviewed in the next section to assist in making the process of analysis in the current study explicit.

2.3.4.1 *Models of thematic analysis*

Two models of inductive thematic analysis are presented, Braun &Clarke (2006) and Ritchie & Lewis (2003) followed by one model of deductive thematic analysis (Fereday & Muir-Cochrane, 2006). This section concludes with a summary of the merits of each and a justification for the chosen method in 2.3.9.

2.3.4.2 *Braun and Clarke's (2006) model of thematic analysis*

Braun and Clarke's (2006) model presented six phases of actions for an inductive or data-driven thematic analysis. This model allocated codes in the early stages of analysis to segments of data and gathers codes into potential themes. Analysts prepared a thematic map to represent the hierarchical relationships between codes and potential themes schematically. The thematic map assisted in the generation of main themes through a process that made the relationships between potential themes explicit in one or two main points. Braun & Clarke's (2006) six phases of actions for an inductive or data-driven thematic analysis are reproduced in Table 4.

Table 4: Phases of Thematic Analysis based on Braun & Clarke (2006)

Phase		Description of the process
1.	Familiarizing yourself with your data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2.	Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3.	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4.	Reviewing themes	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5.	Defining and naming themes	On-going analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6.	Producing the report	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

In this model, thematic maps made the analyst's conceptualisation of the relationships between themes in the data explicit. By making this an essential and valuable phase in the process of analysis, Braun & Clarke provided a means of demonstrating rigour in data interpretation that was integral to the analysis and not a superficial addition to the process (Barbour, 2001). Findings from thematic analysis must be reported in light of existing research (Boyatzis 1998) and this model used supporting literature towards the end of analysis (Phase 6) to situate study findings in a wider context. Braun &Clarke (2006) provided detailed description and examples to illustrate each phase in this model of thematic analysis but stopped short of giving these steps a name that could distinguish it among qualitative methodologies.

2.3.4.3   The framework method: Ritchie & Lewis (2003)

Ritchie and Lewis (2003) cite the obscurity of reported methodology and the lack of distinction between stages of analysis as the driver to develop the framework method of thematic analysis, which they say, aims to explain *how* classification is achieved and hypotheses generated. Framework is an inductive thematic analysis and the name framework comes from the thematic framework that is the primary tool for data management. Analysis in framework is considered to exist fundamentally in two main phases: data management; and data analysis.

Data management in framework starts with familiarisation. The data are indexed by allocating labels to sections of text of varying lengths, from single words to whole paragraphs. Sections may be allocated more than one label depending on relevance to the research questions. In framework a subset of the data is selected to begin analysis which allows the researcher to observe patterns in the labels, group these into higher order categories called themes, and list the themes in a conceptual framework (Ritchie & Lewis, 2003). This initial conceptual framework can then be used to guide analysis of the rest of the data. As analysis proceeds, new labels, groups or concepts are added to the framework. Data management continues by sorting and synthesising the data into thematic charts. A thematic chart presents the data for one theme using examples from all cases in the data set (Ritchie & Lewis, 2003). One chart is created for each category/theme in the conceptual framework. Each participant is allocated one row in the chart; each sub-category is allocated a column. Illustrative examples from each participant are entered into the chart under the relevant heading.

Data analysis commences when the researcher develops a greater level of abstraction of the content and meaning of the data (Ritchie & Lewis 2003). Examination of the data in thematic charts facilitates the observation of patterns, clusters of themes and cases where themes are not recorded. This process promotes and records the process by which the data are synthesised. Familiarisation with the content of each sub-category is gained by within-case and across-case analysis. Greater familiarisation assists in extracting themes from the data and generating an explanatory account.

Despite separating analysis into data management and data analysis, there is no clear-cut stage in framework where one moves between the two; Ritchie & Lewis acknowledge that these stages overlap with analysis happening throughout data management. Thematic charts are part of both data management and data analysis and provide an example of the argument that all actions with the data contribute to generating meaning and themes (Flick, 2002; Silverman, 2000).

The framework method follows steps similar to those set out by Braun & Clarke (2006) with the main differences being in how the models represent the process of conceptualising relationships within the data. In framework, thematic charts provide a means of viewing one theme at a time across the whole group and the individual case. Braun & Clarke's thematic map allows all potential themes in the data to be represented in one place. Both thematic charts and thematic maps have value in seeing patterns in the data and abstracting meaning at different levels. Detailed scrutiny of each thematic chart can aid constant comparison and show how different participants engage with a single concept and how individual participants have engaged with a particular theme. A thematic map can show that some potential themes have links to many topics and therefore may be indicative of the presence of a main theme; other topics may appear isolated and can prompt the analyst to re-examine them to determine their relevance to the research questions.

Like the thematic map, thematic charts not only assist with the process of familiarisation and analysis but also make this transparent and available for scrutiny. One main weakness in framework, however, is the lack of clarity regarding terminology. Theme is used from the beginning of analysis, i.e. in the data management stage and the term 'category' is used to define a group of themes, whereas theme is used to define a group of codes by Braun & Clarke. Further, Ritchie & Lewis (2003) argue that the use of the words 'index' and 'indexing' or 'label' and 'labelling' is more accurate than the term coding, which is used in

grounded theory to describe all stages of the analytical process. Despite issues with terminology, the framework method has the capacity to make the data analysis processes more transparent through the use of thematic charts that may assist in minimising bias and maintaining reflexivity through analysis.

2.3.4.4 *Deductive thematic analysis: using theory to guide analysis*

Inductive thematic analysis is often contrasted with a deductive or theory-driven analysis which involves pre-selecting themes that may be present in the data based on previous research and experience. The case for a theoretically informed thematic analysis was exemplified in a study by Fereday & Muir-Cochrane 2006).

Fereday & Muir-Cochrane (2006) report an explicit description of a procedure for a mixed inductive and deductive thematic analysis. Analysis started by reviewing key texts and identifying relevant concepts to guide the analysis. From the literature review a list of preliminary codes was drawn up into a code manual. The code manual included a list of code names, a definition of what that code contained, and a description of how to recognise the concept in the data. Once the code manual was established in its initial form, a sample of the data was coded to ensure that it represented the data accurately. New codes arising from the data at this stage were added to the code manual at which point the deductive phase of analysis is complete. The inductive stage of analysis then commenced when the code manual was used to code the remainder of the data set, adding new codes as they arose in the data. The final, interpretative, phase of analysis processed the data at a more abstract level and explained the main themes.

Fereday & Muir-Cochrane (2006) demonstrated that starting thematic analysis with *a priori* codes does not necessarily preclude new themes being discovered in the data. Once the code manual had been established from analysis of the sample data, thematic analysis proceeded as for inductive analyses. The process of adding data-driven codes to the code manual was reported as essential in adequately capturing the true meaning of the data. A theoretically grounded code manual, which can be extended in response to the data, offers a middle ground where the researcher neither has to feign ignorance nor be constrained by a fixed checklist of behaviours to observe.

Drawing concepts from existing literature in the early stages of analysis is considered to impose limitations on the analyst's thinking (Ritchie & Lewis 2003, Braun & Clarke 2006). However, qualitative analysis that does not declare previous knowledge or experience could appear as bias and undermine study validity (Malterud, 2001b). Fereday & Muir-

Cochrane reported the literature from which they drew their concepts for the code manual, making this phase of analysis available for inspection with regard to bias. Other qualitative studies use theory to guide the selection of cases for analysis, that is, they employ theoretical sampling. Documenting the processes of data sampling and analysis can add to the verification of findings and subsequent generation of hypotheses (Malterud, 2001b). In the current study, selection of a sample of data for analysis is an area at risk of bias given the researcher's extensive knowledge of the data set and the participants in the SCIP trial as documented in 1.4.1 and 1.5. This review of methodologies now addresses issues of sampling to ensure that the potential for bias is minimised in the current study.

2.3.4.5   *Theoretical and purposive sampling in thematic analysis*

Sampling in quantitative research is concerned with gaining a suitably large and representative sample of a population in order to make generalisations about the findings. Within qualitative research, the analytical methods employed require small numbers of participants and therefore as a discipline, qualitative research faces challenges in describing findings as generalizable (Silverman 2000). The careful and explicit selection of a sample to address the aims of the study can add to the validity and generalizability of the findings from qualitative research. Two means of sampling are set out below: theoretical sampling and purposive sampling.

A theoretically derived sample deliberately includes cases that are important in answering the research questions. The researcher's theoretical position is developed through analysis of a sample that includes cases that will test the theory not just prove it, i.e. by choosing cases related to a particular theory and by choosing cases that are 'deviant', (contain data contrary to the chosen theory) (Silverman, 2000). In addition, theoretical sampling allows the size and composition of the sample to change as analysis progresses; cases with certain characteristics can be included to further test the developing theory, such as in grounded theory.

Purposive sampling involves the deliberate selection of cases where the topic being studied is most likely to occur (Silverman 2000). The cases in a purposive sample are considered to represent a 'type' in relation to criteria related to the research questions (Ritchie & Lewis 2003). Common criteria for inclusion in a purposive sample are age, socio-demographic characteristics and specific experiences or roles. The aim of purposive sampling is to ensure that all relevant features of the research focus are included (Ritchie & Lewis 2003). Purposive samples can be decided by using a classification matrix or typology that sets out

the criteria relevant to the research aims (Silverman 2000). Critical case sampling is a kind of purposive sampling that selects one case on the basis of its ability to demonstrate the area of investigation as comprehensively as possible.

2.3.4.6   Summary of thematic analysis

In thematic analysis, data are examined for themes and patterns rather than for a frequency count of events, and the output is a description of the key themes that can explain the data succinctly (Morse, 2008). Thematic analysis starts by identifying meaning related to the research questions in sections of the data and applying codes to these sections, before reducing the codes to a few categories and ultimately to one or two main themes. Thematic analysis can be inductive, using the data to develop explanatory accounts of it, or it can be deductive, using theory to guide analysis. Whether inductive, deductive or both, thematic analysis is a process of breaking raw data down into meaningful units, reconstructing the meaningful units into categories and through examination of the data in categories, themes representing the wider meaning of the data in context are revealed.

Two models with clearly identified steps for an inductive thematic analysis have been reviewed here. The framework method (Ritchie & Lewis 2003) makes the processes of analysis available for scrutiny through the documentation of themes and sub-themes in a thematic chart. Braun & Clarke (2006) create a thematic map of all themes and the relationships between them. Both processes assist the analyst in showing how data have been organised at different levels of abstraction, from codes to categories and finally into themes, that would otherwise not be visible. Deductive thematic analysis starts by reviewing relevant literature to create a coding manual to which additional codes and categories are added as analysis proceeds. The three models reported here aim to improve the rigour of analysis and validity of findings from thematic analyses by making the stages and processes of analysis transparent. Each of these models has value for the current study and elements of each will be adopted. Together with a justification for use of both theoretical and purposive sampling, the method for the current study is reported below.

2.3.5   Summary and justification for the chosen method

The current study is exploratory in nature and therefore neither systematic observation (that uses a checklist to count examples of behaviours) or grounded theory (that develops

theory and progresses in cycles of iterative analysis in response to emerging findings) are suitable methodologies. A deeper understanding of metacognition in SLT intervention may be most appropriately gained by conducting a mixed deductive and inductive thematic analysis such as that demonstrated by Fereday & Muir-Cochrane (2006). This will provide the opportunity to incorporate theory on metacognition to guide and constrain an analysis that is, in essence, inductive.

A deductive thematic analysis could make use of existing theory on metacognition as a construct in learning and teacher-pupil interactions (for example, derived from studies of Reciprocal Teaching) to determine what elements of metacognition are present in SLT practice. However, a coding checklist limited to what is known about metacognition in teacher-pupil exchanges may not represent how SLTs interact with language-impaired children in the course of delivering direct therapy. Issues of difference in terminology in use in SLT practice and in studies reporting metacognition in reading instruction may mean that a coding checklist of metacognition terminology will be difficult to apply to interaction in SLT intervention. A preliminary list of terms and key concepts in metacognition will therefore need to be open to adaptation as analysis proceeds.

A theoretically derived sample can specifically select cases that are thought to be essential to addressing the research question (Silverman 2000). The research focus of the current study is to determine the nature of metacognition in SLT delivery and this can be tested by selecting a case known to contain activities that require metacognitive knowledge and skills. Such a case is known as a critical case (Ritchie & Lewis 2003). The researcher's knowledge of the SCIP cohort and video data set documented in 1.4.1 can be used to select a critical case. Inductive analysis of the critical case using the list of metacognition terminology would provide the means to develop a preliminary coding framework as per the framework method, while using terminology derived from metacognition to conceptualise therapy actions within the theory on metacognition. An initial coding framework, like the coding manual from Fereday & Muir-Cochrane's (2006) study, will contain a list of code names, a definition of what that code contains and a description of how to recognise the concept in the data.

Metacognition has been shown to develop over time and to be delayed in children with LI (Lockl & Schneider, 2006; Skarakis-Doyle & Dempsey, 2008). Theoretical sampling would therefore suggest that children of different ages and children with and without LI should be included in the sample for analysis. Children with PLI have features of both LI and ASD

(Bishop, 2000) and so the sample for analysis should include children with features of both. A typology to represent the children's age and profile of impairment would guarantee that the sample would be representative of the cohort of children who received SCIP intervention. In SCIP, twenty intervention sessions were delivered by the RSLT and a team of four ThAs (Adams et al., 2012b). It is important therefore to also include in the sample different intervention agents and different time points in the child's intervention period.

2.4   Summary of literature review

Metacognition is concerned with the monitoring and control of person, task and strategy knowledge. SLTs employ metacognition in therapy for children with LI to teach monitoring skills as part of a 'theory of therapy' that is influenced by knowledge of impairments, typical development and established therapy methods. Metacognition appears to be a component of therapy that aims to teach monitoring and controlled use of specific language skills but evidence implies that recognition of this is tacit rather than explicit (Law et al., 2008). Within research on DLDs, the precise role and nature of metacognition has not been subject to detailed exploration and it is not elaborated in models of therapy (Adams, 2005; McCauley & Fey, 2006). Consequently, there is no established methodology for examining aspects of metacognition, such as metacognitive person, task and strategy knowledge or metacognitive monitoring and control, in SLT delivery. The extent to which SLTs' use of metacognition can be seen to have any therapeutic effect can only be examined once its presence in the intervention is described.

2.5   Purpose of the research

The Social Communication Intervention Programme (SCIP) has been described as having a positive outcome for some aspects of communication in children with PLI. However, it remains unclear what it is about the intervention that is responsible for the effect. That is, there are many aspects of SCIP therapy delivery and in particular, the interactive nature of therapy, which remain poorly recorded and understood. Investigation of these aspects is important in terms of future application of SCIP and would contribute to the development of "specific conceptual models to explain those processes that are responsible for therapeutic change." (Kazdin, 2007 p. 16). Qualitative inquiry has the potential to reveal

knowledge that may be tacit within clinical practice (Malterud, 2001a) and investigating an intervention that is known to be effective is recommended in the search to identify mechanisms of change in an intervention (Kazdin, 2007).

A qualitative analysis of the SCIP therapy video data for evidence of metacognition might provide insights into how therapeutic strategies from each section of the manual combine and may show how metacognitive skills of monitoring and control, necessary for generalisation, are present in the tasks or in the therapist-child interaction. Further, it might also be possible to determine whether, as Law et al. (2008) found, activities can be classified as either metacognitive or more concerned with skills acquisition. The extent to which metacognition can be considered an active or essential ingredient in SCIP intervention and what role it might have in generalisation of skills for children with PLI can only be known once its presence in the intervention has been identified. A first step towards being able to understand the function of metacognition in SLT would be, therefore, to develop a means of identifying its presence. By examining SLT's interactions with clients in the course of completing tasks, it may be possible to detect which metacognitive processes are performed by the SLT and which by the client. It may be that, when the SLT adjusts the task or models a strategy, there is an implicit assumption that the client lacks the metacognitive knowledge of the task demands and of the most appropriate strategy to complete it successfully. Or, it may that the SLT assumes that the child lacks the metacognitive skills needed to monitor their performance and adjust their approach as required. Further, it may be possible to observe the ways in which the SLT adjusts the task or the strategy being taught in order to make the task achievable.

The primary purpose of this research therefore is to determine which aspects of metacognition can be identified in speech and language therapists' interactions during therapy with children with PLI.

3   Methods

This chapter reports the procedure for gaining ethical approval for the current study, describes study materials and the sampling procedure employed. The development of an initial metacognitive coding framework (MCF) from an inductive and deductive analysis of the critical case is described. The procedure for applying the MCF to the remainder of the current study sample following principles of iterative analysis is set out. The method for adapting the MCF as analysis proceeds is given. The development of a coding framework to ascertain the metacognitive content of SCIP intervention is presented in detail before the application of this coding framework to the remainder of the sample is described. Iterative steps taken to expand and finalise the coding framework are reported.

3.1   Ethical approval and procedures

The data used for analysis in the current study are video recordings of SLT intervention sessions gathered during the Social Communication Intervention Project (Adams, et al., 2012a; Adams et al., 2012b) and are subject to ethical approval gained for the SCIP trial from the Northern and Yorkshire NHS Research Ethics Committee (REC No. 07/MRE03/3). Additional NHS Ethical approval was gained from the NRES Committee North West (Ref: 12/NW/0097) to use this pre-existing video data in the current study.

Research governance approval was gained from six NHS Trusts in the North West of England. NHS SLT services were engaged by Dr Adams, MPhil supervisor and Principal Investigator (PI) for the SCIP RCT, to send information and consent forms to the SCIP families on behalf of the researcher. Parents returned their written consent and their child's written assent directly to Dr Adams. The researcher was notified of all consenting participants and given supervised access to video data and anonymised language data from the SCIP dataset.

The thesis supervisors, who are also the SCIP principal investigators, ensured that the management of anonymised data complied with the ethical permissions covering SCIP data. Individual video files were saved using a unique number with the date of the recording and the RSLT/ThA initials and stored on an encrypted hard drive kept in a locked filing cabinet in the University of Manchester. The data were accessed from the hard drive

and viewed in a private room using headphones to keep the content confidential. All files created in connection with the current study were stored on an encrypted university computer. All cases were allocated a pseudonym for the purposes of reporting in line with ethical procedures.

3.2   SCIP trial intervention video data

SCIP therapy sessions were video-recorded on high-quality digital video cameras. Video-recordings ranged from 48- 60 minutes and showed the RSLT or ThA working with one child in a schoolroom designated for withdrawal lessons. Attempts were made to minimise background noise and some recordings used an external microphone for enhanced sound quality. The participant's LSA was sometimes present but was not visible on recordings.

Intervention sessions typically included three or four different therapy activities from the three main sections of the SCIP intervention manual (see section 1.4). Recordings showed pictures, puppets or miniature people appropriate to the child's communication needs and interests. Most children completed activities from PRAG 1 and LP 5 (Adams et al., 2012b), (see Table 2) and through these activities created an individualised list of active listening and comprehension monitoring strategies using symbols to represent, e.g. sitting still, listening, thinking about the work. This became known as the child's 'listening chart'.

Each child completed a set of workbooks according to their needs, variously their 'book of feelings', a 'friendship book' or a 'conversation book'. In addition, each child had a Home book which the RSLT, ThA, parents and teachers used to share information related to the intervention (Adams et al., 2012b). The chart and workbooks were used during the intervention period and were talked about on the video-recorded sessions.

3.3   The data sample for the current study

The study used theoretical and purposive sampling to gain a representative sample from the SCIP trial intervention video data set and to include a critical case deemed to be rich in metacognitive content.

3.3.1 Selecting cases based on age, language ability and autistic features

A total of eleven written consent forms were returned, providing access to 16.5 hours of SCIP trial video data available for inclusion in the present analysis. Video recordings of inadequate quality or duration were excluded (N=2). Access was permitted to anonymised language data from the SCIP databank for the remaining nine children in order to select a group of children representative of the clinical language profile of children who received SCIP intervention in terms of language ability and autistic features. Children of different ages were included to take into consideration delays or differences in metacognition as children mature. Table 5 shows the clinical profile and age of the five cases selected to be representative of the SCIP cohort. SCIP means are reported from Adams et al. (2012a) and are shown in the last four rows.

Table 5: Clinical characteristics of SCIP participants sampled for the current study

Case number	Age in months	CELF-4 CLS	SCQ	Clinical profile
1	71	56	21	PDD-NOS + Language Impairment
2	123	67	14	Non-ASD + Language Impairment
3	102	87	37	ASD + normal limits language
4	94	90	15	PDD-NOS + normal limits language
5	109	62	11	Non-ASD + Language Impairment
Mean	99.8	72.4	19.6	
Range	71-123	56-90	11-37	
SCIP Mean	100.5	72.6	20.3	
SCIP Range	71-128	40-114	2-37	

Notes: *Case 1 session 1 is the critical case Key: CELF-4 CLS = Clinical Evaluation of Language Fundamentals Core Language Score; SCQ = Social Communication Questionnaire. Notes: CELF-4 Standard scores have a population mean = 100.

Note on Table 5: For the purposes of the SCIP trial, children are assigned to three major categories on the Social Communication Questionnaire (SCQ) (Rutter et al., 2003). This is not intended to provide a definitive diagnosis and should be considered to be indicative only. SCQ categories are: * PDD-NOS 23 (27%) ASD 40 (48%)

- Non-autistic (Non-ASD) – the child does not meet criteria for autism diagnosis: SCQ score ≤ 14

- Pervasive Developmental Disorders Not Otherwise Specified (PDD-NOS) – defined in DSM IV (American Psychiatric Association, 1994) as a severe and pervasive impairment in the development of reciprocal social interaction or verbal and nonverbal communication skills but does not meet criteria for autistic disorder because of late age of onset, atypical symptomatology, or subthreshold symptomatology: SCQ score between 15–22
- Autism Spectrum Disorder (ASD): SCQ score ≥ 22

Similarly in Table 5, participants have been specified as having or not having LI based on their performance on the CELF - 4 (UK version) (Semel et al., 2006). Language impairment was designated as present if the child achieved a Core Language Score of 79 or less; this follows the practice recommended in the CELF-4 UK Examiner's Manual.

3.3.2 Ensuring a representative sample of intervention content

A summary of the intervention content, therapy agent and session number for the complete sample is shown in Table 6.

Table 6: SCIP intervention content, session number and therapy agent for the selected sample

Case no	SCIP session number	RSLT or ThA	SCIP Intervention content: Section and activity numbers				
1*	1	RSLT	PRAG 1.1.1	PRAG 1.1.2	LP 5.1.1 LP 5.1.2	SUSI 1.1.1	LP 2.1.2
1	8	RSLT	SUSI 1.4.1	LP 1.2.1a	LP 4.2.1	LP 4.1.1	
2	11	ThA	SUSI 2.5.1	SUSI 2.5.2	SUSI 5.1.1	PRAG 5.3.1	SUSI 4.2.1
2	18	RSLT	LP 3.1.2	LP 1.1.6	LP 4.2.3	LP 1.5.2	
3	14	ThA	SUSI 2.2.1	SUSI 2.5.2	SUSI 4.2.1	PRAG 5.3.1	
4	16	ThA	LP 4.2.3	LP 4.2.2	LP 4.2.4	PRAG 5.1.4	SUSI 4.2.1
5	15	RSLT	SUSI 3.1.1	SUSI 3.1.2	LP 4.2.4	PRAG 1.5.3	
5	4	RSLT	SUSI 1.3.1	SUSI 1.4.1	PRAG 1.4.4	LP 2.2.1	LP 2.3.1

Notes: *Case 1 session 1 is the critical case

From the video data available for the five cases selected for analysis, a total of 8 intervention sessions were chosen to represent:

- intervention delivered by the RSLT and three of the four Manchester-based ThAs
- sessions from all time-points in SCIP delivery (up to 20 sessions maximum) and
- content from all three aspects of the SCIP manual (Language Processing, Pragmatics, Social Understanding and Social Interaction)

Note that two video-recordings were included for cases 1, 2, and 5. For case 2, one recording of the RSLT and one of the ThA delivering therapy were included. Examples of the therapy activities are provided in Appendix 2.

3.3.3 Selection of the critical case

The method for selection of the critical case will now be set out. The intention was to select an intervention session from the critical case's intervention so as to develop a preliminary analysis framework.

One case, selected to be the best example of the topic under investigation, 'the critical case' was selected from the purposive sample of five cases based on three criteria. The criteria were that the intervention:

1. had been delivered by an experienced SLT to ensure that a high standard of integration of the three main aspects of SCIP intervention could be observed
2. included examples of activities targeting goals in all three areas of SCIP Intervention, i.e. LP, PRAG and SUSI goals, to provide a rich material for coding the metacognitive content of activities targeting different goals, and
3. included the activities on comprehension monitoring (LP 5) and metapragmatics (PRAG 1) known to demand some level of metacognitive teaching and / or ability in the child.

The metacognitive content was derived from the therapy goals of the SCIP activities.

Applying these criteria to the sample, case number 1, SCIP session number 1 was selected. The SCIP intervention content of this session and the known metacognitive demands are reported in Table 7. Information from the SCIP intervention record for this case showed

that in session 1, six separate activities from all three aspects of the SCIP manual had been delivered. Of these, two were metapragmatic tasks (PRAG 1) and two were comprehension monitoring tasks (LP 5). It was predicted that the discussion between the child and therapist in the course of therapy delivery would reveal examples of the nature of metacognition in the design and delivery of these tasks. The metacognitive content of the remaining two activities (SUSI 1.1.1 and LP 2.1.2) was not known. Activities PRAG 1.1.2 and LP 5.1.1 are in Appendix 2.

Table 7: SCIP intervention content and known metacognitive demands of activities delivered within the critical case (Case 1: session 1)

SCIP Intervention Section and Therapy Activity	SCIP Intervention activity purpose	Known metacognitive content
PRAG 1 Conversation and metapragmatic skills 1.1 Improving Listening skills Activity 1.1.1 Good Listening skills and Activity 1.1.2 Listening for content	The child will understand the concept of listening to the interlocutor and will be familiar at a metapragmatic level with the features of good listening skills	The child will be required to monitor the effect of a range of strategies for listening in themselves and others (SLT / puppet) e.g. sitting still, looking at the speaker.
LP 5 Comprehension monitoring 5.1 Comprehension monitoring Activity 5.1.1 Understanding the concept of knowing and not knowing and Activity 5.1.2 Understanding the concepts of guessing and working out	The child will learn the difference between knowing and not knowing and the difference between guessing and working something out. The aim is to replace unhelpful guessing and communication breakdown with asking for help and using known information to work something out	The child will be required to monitor what they, and others, know. They will be asked to monitor the effect of strategies for learning and use the most effective strategy to enhance person knowledge. The child is required to know and use mental state verbs.
SUSI 1 Understanding social context cues in interactions 1.1 Understanding Non-verbal cues in context Activity 1.1.1 Making simple inferences from familiar sequences	The child will be able to make simple inferences and describe actions and interactions in familiar social sequence pictures	The metacognitive demands of this task were not known at the outset of the analysis of the critical case.
LP 2 Narrative Construction 2.1 Sequential organisation of simple stories Activity 2.1.2 Simple sequencing	The child will be able to organise ideas into simple sequences and narrate the events.	The metacognitive demands of this task were not known at the outset of the analysis of the critical case.

3.3.4 Preparation of the transcripts for each video recording

Verbal interaction of participants and the RSLT/ThA in each video recording in the sample was transcribed by the researcher to provide a transcript of the content of the intervention session and the dialogue between the RSLT/ThA and the child undergoing SCIP intervention. The dynamics of turn-taking and characteristics of the speech delivery were not transcribed. Non-verbal contributions were noted only where the meaning of the verbal comment was enhanced or contradicted and were reported inside square brackets. Scripts provided for use in SCIP activities were recorded in italics. All comments except those marked 'Child:' are those of the RSLT/ThA. Contributions from Learning Support Assistants were marked on the transcript as LSA. Each video transcript was checked for accuracy by the researcher prior to coding by watching the video through and making notes for changes directly on to the transcript.

3.4 Planned method for analysis

There were three main phases of analysis in the current study:

1. Development of the initial metacognitive coding framework (MCF) (section 3.4.1). The final MCF is reported in the Results chapter and the complete initial MCF developed from analysis of the critical case only is provided in Appendix 3.

2. Use of the MCF to code transcripts of therapy sessions for the selected sample (section 3.4.2)

3. Thematic analysis of the data to determine the nature of metacognition in SCIP therapy content and delivery (section 3.4.3)

3.4.1 Development of the initial Metacognitive Coding Framework from analysis of the critical case

The steps taken in the analysis of the critical case and the development of the initial MCF are shown in Table 8.

Table 8: Steps taken in the analysis of the critical case to develop the initial MCF

Steps in analysis	Description of the process and its role in developing the MCF
1. Review of the literature on metacognition in childhood.	Terminology and key concepts were recorded for use in interpreting therapy tasks and SLT actions in delivering them for their metacognitive function.
2. Familiarisation	The video data were transcribed and checked for accuracy. On second viewing, descriptions of meaningful non-verbal interaction, notes on context and initial thoughts on the metacognitive content were added.
3. Creation of a list of codes from each utterance in the transcribed data.	Codes were assigned to each utterance in the transcript. Codes were derived from terms extracted from the literature in metacognition. Where the metacognitive function of utterances was not immediately obvious, terms meaningful in SLT practice were used
4. Review of the list of codes with the transcript to ensure accuracy and consistency and to develop a metacognitive perspective on the intervention content.	The transcript was reviewed for accuracy and duplication of codes. Each code was reconsidered with a view to using terms in the metacognition literature The session content and therapy aims were reconsidered in terms of metacognitive concepts and terminology
5. Search for patterns and relationships between codes and grouping codes into categories.	Conceptually-related codes were collected together and the meanings of codes began to be synthesised The codes were grouped into categories of super-ordinate and ordinate terms. These categories were viewed as representing potential themes. The list of codes was checked for duplication of codes or categories.
6. Categories listed in the initial metacognitive coding framework (MCF) with sub-codes and numbers.	Categories and codes were allocated to the initial MCF. Codes were allocated to the MCF in the order in which they were observed in the critical case. A code number was assigned to each category, code and sub-code.
7. Verify the relevance of the categories in the MCF against the critical case and select illustrative examples.	The transcript of the critical case was coded using the code numbers assigned to each category and sub-category on the initial MCF. Illustrative examples from the transcript of the critical case were added to the MCF for each category and sub-category.

A preliminary metacognitive coding framework (MCF) was developed from a mixed inductive and deductive analysis of the content of the critical case. The content of the critical case was transcribed and annotated as described in section 3.3.4. Familiarisation was achieved through repeated reading of the transcript and viewing of the recording. A

deductive analysis of the critical case was conducted using terminology and concepts from the literature to guide interpretation of the content and delivery of therapy. The data were broken down into distinct units of meaning by allocating a code to each utterance that described in summary its purpose in terms that reflected the literature on metacognition and/or in terms in common use in SLT practice: Step 3 in Table 8.

Codes were listed in a separate document and examined for shared meaning as a means of grouping them into categories. Once the categories and the related codes had been identified, they were listed in the initial MCF with a category label, a code name, definition and a reference number.

3.4.1.1 *Reconsidering SLT actions as metacognitive codes: Step 3*

An important step in creating the initial MCF was the creation of a list of codes to describe the metacognitive content of the data (Step 3, Table 8). Codes that had retained terminology from SLT practice were examined closely to determine whether they could be re-coded using metacognition terminology. An example is provided here to illustrate the actions taken as part of Step 3 to re-conceptualise terms in regular usage in SLT practice into terms used in the literature to describe specific metacognitive actions.

In coding the transcript of the critical case, four terms common in SLT practice had been used to code comments made by the SLT; the codes were 'feedback', 'praise', 'correction' and 'reinforcement'. Data coded using one of these four codes were examined to determine a suitable metacognitive label for the functions observed. From this, feedback was considered a generic term within which praise and correction existed as related items, and reinforcement appeared as feedback with a particular function.

Following this, all data previously coded as either praise, correction, feedback or reinforcement were now coded as feedback. The next stage was to interrogate all the data now coded as feedback in their original context in the transcript. This made it possible to see that what had previously been coded 'reinforcement' could now be coded to represent its metacognitive function, i.e. 'feedback on using a strategy', or 'feedback on performance on a task'. Feedback was added as a code to the categories of Strategy and Task on the initial MCF and the data re-coded accordingly. In this way, other under-specified terms within SLT became clearly specified within a metacognitive category using a code which described its metacognitive function.

3.4.1.2   Developing metacognitive categories from codes: Step 5

At step 5, codes were grouped into categories based on shared meaning using super-ordinate and ordinate terms. The list of codes was checked for duplication or similarities between codes. Duplication, or close approximations, of terminology was resolved through examination of the data in context. The following excerpt illustrates how metacognitive codes were grouped under one category. Line numbers from the transcript of the critical case are provided for reference.

After introducing the first task in line 3, the SLT asks the child what they already know about it in line 4. This was coded as **activating prior knowledge of the task:**

> 3 *And what you and I are going to do today, we're going to think about good listening*

> 4 *Do you know about listening? What do you have to do when you are a good listener?*

The child's response in line 12 and 14 were coded as **stating prior knowledge of the task**

> 12 *Child: Good looking*

> 13 *That's right, so, what, you just said, 'good looking'. What do we look at when we are listening?*

> 14 *Child: Listening, you got to look at the teacher*

The SLT asks the child what else they know in line 13, and then **explains how the child's existing knowledge links to the task** of listening in lines 20, 21 and 24.

> 20 *You said, you've got to look at the teacher, good thinking. So when we are together*
> 21 *and when you are listening, you will be looking at me, won't you?*

> 23 *Child Yeah*

> 24 *….and when I am listening I will be looking at you.*

> 25 *Child: Yeah*

The common thread in these codes is **prior knowledge** of the task at hand. Prior knowledge was therefore taken as the category and 'activating', 'stating' and 'explaining the link between prior knowledge and the task' as the codes within this category.

Following this procedure for the entire transcript of the critical case, four categories were listed in the initial MCF with codes and sub-codes. The four categories are:

Category 1: Talking about tasks

Category 2: Talking about prior knowledge

Category 3: Talking about strategies

Category 4: Talking about monitoring

An example of codes and sub-codes within one category is shown in Table 9.

Table 9: Sample of codes and sub-codes and examples from Category 1 on the initial MCF

Category 1: Talking about tasks		
Code and sub-code with reference numbers		Example to illustrate
1.1 naming tasks	1.1.1 using specific names for tasks	*And what you and I are going to do today, we're going to think about good listening*
	1.1.2 the non-specific names for tasks	*We're going to do lots of nice things today, shall I tell you what we are going to do?*
	1.1.3 CHILD names a task	*Child: Good listening*

3.4.1.3   *Verifying the content of the initial MCF: Step 7*

Once the categories, codes and sub-codes had been compiled into the initial MCF, the transcript of the critical case was coded as a complete document (Step 7). This was undertaken for two reasons: firstly, the content of the critical case had been broken down systematically into isolated units of meaning which formed the codes on the MCF. It was important after this process to verify that the metacognitive content of the critical case as a series of real events in context could be accurately captured by the initial MCF. Secondly, coding the critical case transcript using the initial MCF permitted the extraction of key illustrative examples for each category, code and sub-code which was used to assist in coding subsequent data transcripts.

At this point, each utterance was allocated a code number from the MCF as per the framework method described in section 2.3.4.3 above. All data in the critical case were captured by the MCF and no new categories, codes or sub-codes emerged at this stage. Examples of utterances for each code were examined after the transcript had been coded and the most illustrative examples of each code and sub-code were recorded in the MCF. The initial MCF is shown in Appendix 3.

3.4.2 Coding the remainder of the transcripts and finalising the Metacognitive Coding Framework

The procedure for using the initial MCF to code the remainder of the data is reported below. As each new case was analysed, previously unidentified codes or sub-codes were added to the MCF in a process of iterative analysis.

3.4.2.1 Coding the data transcripts

The initial version of the MCF was used to code the transcripts of the remainder of the sample of video data for evidence of metacognition (N recordings = 7). Each video recording was transcribed and examined by the researcher as per Step 2 in Table 8 to gain sufficient familiarity prior to coding. Each utterance in the transcript was allocated to a code on the initial MCF as per the framework method. Data that could not be allocated to an existing code on the initial MCF were initially labelled 'other'. At the end of analysis of the transcript, all codes labelled 'other' were re-examined both as individual units of text and as a group. New codes and / or sub-codes were derived from the nature of the utterance in context with reference to the literature as per Step 3 in Table 8.

3.4.2.2 Adding new codes to the MCF

Following an iterative process of analysis, a new version of the MCF was created after each transcript had been coded *only* if new codes or sub-codes had emerged. The newest version of the MCF was then used for analysis of subsequent cases. Previously coded transcripts were re-examined to determine whether the new codes and sub-codes were present. The content of the MCF was finalised when no new codes or sub-codes emerged from analysis.

With the proviso that this phase of data 'management' is considered to have contributed to data analysis, it can be viewed that thematic analysis and the search for wider meaning in the data commenced after all data had been coded in this way and saturation had been achieved, that is, no new codes had been added to the MCF. Thematic analysis used thematic charts and thematic maps to identify main themes both of which are illustrated below in Section 3.4.3.

3.4.3   Thematic analysis

This phase of analysis was predominantly inductive and adopted the framework method of analysis (Ritchie & Lewis 2003) but used thematic maps as per Braun & Clarke (2006) and permitted the use of theory as per Fereday & Muir-Cochrane (2006) to assist in interpretation of therapist-child interaction (see sections 2.3.4.1 – 2.3.4.3 and 2.3.5).

Once the data had been coded and categorised, the process of thematic analysis started. Greater familiarity with the data at this stage of the analysis permitted deeper processing of the metacognitive content of the SCIP intervention sessions and a more abstract conceptualisation was achieved. Main themes emerged from the data as a result of familiarity with the content of the transcripts, storing examples of metacognition in SLT in thematic charts and maps and from consideration of the metacognitive content across and within each of the data transcripts. Key papers in the research literature on metacognition were revisited to determine deeper understanding of metacognitive concepts and their function in teaching strategies. Themes were developed based on salience and meaningfulness of metacognitive concepts within the context of SCIP intervention and not on the basis of frequency of occurrence in the transcripts.

3.4.3.1   *Preparation of thematic charts*

Thematic charts were prepared to assist with data management and thematic analysis as recommended by the framework method (Ritchie & Lewis 2003). Data from all the transcripts that had been allocated to the same code were separated from their original context of the transcript and collected together in one chart. Microsoft software was used to create one chart for each category on the MCF. Each sub-code was allocated to a column on the thematic chart, each participant to a row. The most representative examples of each code and sub-code from each data transcript were included on the thematic chart. Where examples of codes or sub-codes were not found in a transcript, 'not found' was entered to that column on the thematic chart. This process presented the data in the transcripts as separate groups of meaningful units of text. Thematic charts permitted the data to be viewed by category and by case. Patterns within and across cases were identified that might represent emergent themes. For example, the category Prior Knowledge recorded the ways in which the RSLT/ThA asked children what they already knew about the task or strategy they were working on. An extract from the thematic chart for the category 'Talking about Prior Knowledge' is shown in Table 10.

Table 10: Extract from a thematic chart for one code from Category 2 on the MCF

2 Talking about Prior Knowledge 2.1 find out what the child knows by asking		
	2.1.1 about the current task	2.1.2 about the strategy being practised
Video		
Case 1 Session 1	*Do you know about listening?* *What do you have to do when you are a good listener?*	*What do we look at when we are listening?* *Tell him what he needs to do to be a good listener.*
Case 2 Session 11	*So what about all the people at the party? Who was there?* *Were there some friends there?* *Child: yeah my friends …. and I play with them.* *So what did you do at the party? Did you play games?*	*How did you feel before you went to the party?* *Child: nervous* *Were you? Were you nervous?* *Child: yeah, [makes scared noise]* *What did you say to mum?* *Child: I just said, I said to mum, 'I'm nervous' I feel a bit like [unintelligible due to acting scared]* *Why were you nervous? What were you thinking?*
Case 3 Session 14	Not found	*And bits of information that don't help us to work out what's happening can go in the 'irrelevant' column. And I can see in this picture some chairs. Do you think they are relevant or irrelevant?*
Case 4 Session 16	*And I know that last time you looked at some of these pictures with Jacqueline, didn't you? Now… this girl, what is she doing?*	*Have you been trying out playing with other people?* *….* *Child: I did.* *Child: Um… football.* *You played football? Who with?* *Child: James.* *…..* *What did you say?*
Case 5 Session 15	*What I want to do today ….* *What I want to do is I want to think about routines and accidents. Do you know those words?*	*[writes] there is nothing I can do about this. If we had a big rubber we could rub the traffic lights out, but can we do that in real life? [shakes head]* *Child: no [shakes head]* *So can we think of a solution …..but we can feel better? How do we get from being angry and worried to being OK?*
Case 1 Session 8	*Okay, do you remember we've been looking at Charlie Cook's favourite book? And I've been asking you to remember some words….* *How many will we start with?* *Child: Two*	*What else do we think about when we're working?* *Child: [hand in air] ooh! Don't talk at the same time*
Case 2 Session 18	*So, what have you learned about learning new words?*	*And does thinking about the first letter help?*
Case 5 Session 4	*Do you think that conversations sometimes get a bit jumbled?*	*Tell me about taking turns*

3.4.3.2 Preparation of a thematic map

A thematic map was prepared as analysis progressed to represent the data in categories with links between categories and examples from the data. A section of an initial thematic map developed from the analysis of the critical case is presented in Figure 4 as an example of this process. Note that this represents a stage in the process of analysis and not a result of the analysis.

Figure 4: An extract from an initial thematic map of metacognition in the critical case

```
                          ┌──────────────┐
                          │  Monitoring  │
                          └──────────────┘
        ┌─────────────────┐          ┌──────────────────┐
        │ Talking about   │          │ Talking about    │
        │ prior knowledge │          │ strategies       │
        └─────────────────┘          └──────────────────┘
    ┌──────┐      ┌───────┐      ┌──────┐      ┌───────┐
    │ Self │      │ Other │      │ Self │      │ Other │
    └──────┘      └───────┘      └──────┘      └───────┘
```

E.g. *Do you know what is in my box?*

E.g. *Do I know what is in the box?*

I know. I know because I put it in, didn't I?

E.g. *Were you thinking about the work? [points to icon on chart] You were thinking about something else.*

Child: nods and smiles

E.g. *Is Sheep listening?*

Child: Ye, no.

No! Where is he?

Child: Right behind your back

Did he do good sitting?

Child: shakes his head

Links between categories, codes and sub-codes were represented in this way throughout analysis until main themes emerged. Data transcripts were revisited to make sure that the themes arising in analysis were consistent with the interpretation of the data in the original context. Results of thematic analysis and the final MCF are reported in the next chapter.

4 Results

The primary purpose of this research was to determine which aspects of metacognition can be identified in speech and language therapists' interactions during therapy with children with PLI. A metacognitive coding framework was development in order to achieve this. The development of the metacognitive coding framework (MCF) from its initial form to the final version resulting from this analysis is reported in section 4.1. The final MCF is reported in full in section 4.2 (and Table 13).

SCIP therapy content and delivery was found to contain both metacognitive knowledge and metacognitive skills of monitoring and control. Sections 4.3.1, 4.3.2 and 4.3.3 respectively report examples of main themes of metacognitive person, task and strategy knowledge. Section 4.4 reports how a further main theme of metacognitive skills in monitoring and control were represented. Task design and demands were found to play a particular role in adjusting the metacognitive content of the therapy activities. A model was derived during analysis to represent the impact of changes to task on the therapy goal and clinical actions. The model, considered to represent the SCIP therapy process, is presented in Figure 5 in section 4.4.

4.1 The development of the metacognitive coding framework (MCF)

The development of the initial metacognitive coding framework (MCF) from analysis of a critical case was reported in section 3.4.1 in the Methods chapter. The process for coding the remainder of the data sample using the initial MCF was outlined in section 3.4.2.

This section sets out how an inductive and deductive thematic analysis of the remaining cases in the data set added new codes to the initial MCF. Details of the steps taken in the development of the MCF are explained using examples from the transcripts to illustrate key points.

4.1.1 Coding the data transcripts

The remainder of the sample of video data (N=7 recordings) was analysed for evidence of metacognition in the order presented in Table 11. This also shows when new codes were added to the initial MCF.

Table 11: Order of analysis of the video data and when new codes were added to the MCF

Order of analysis	Case no	SCIP session number	RSLT or ThA	New codes added to the MCF
1	1*	1	RSLT	MCF established in initial form
2	2	11	ThA	4 new codes added
3	3	14	ThA	No new codes added
4	4	16	ThA	No new codes added
5	5	15	RSLT	No new codes added
6	1	8	RSLT	No new codes added
7	2	18	RSLT	No new codes added
8	5	4	RSLT	No new codes added

*Case 1 session 1 is the critical case

Transcripts of each video recording were coded in order using the initial MCF. As each new case was analysed, previously unidentified codes or sub-codes were added to the MCF. New codes were added to the initial MCF from analysis of Case 2 session 11 only. No new codes emerged from analysis of subsequent cases. In Case 2, the ThA explained the vocabulary required for the task and a new code *1.7 Explain vocabulary needed to do the task* was added to category 2: Talking about tasks. An excerpt from the transcript of case 2 (lines 262-275) was added to the MCF as the illustrative example, as shown in Table 12.

Table 12: New code 1.7 added to the MCF after analysis of Case 2 session 11

Category 1: Talking about tasks		
Code and sub-code with reference numbers		Example to illustrate
1.7 explain vocabulary to complete the task		*Child: what are hobbies?* *Hobbies are things you like to do* *Child: football?* *Yeah, football, dancing,* *A hobby is not just something* *that you like; it's something that* *you do as well.*

Three further additions to the MCF were made to Category 4: Talking about monitoring from the analysis of case 2 to capture the metacognitive nature of the therapist and child discussion. The discussion was in relation to a recent actual event in the child's life (going to a birthday party and feeling scared of the balloons). This discussion took place during activities SUSI 2.5.1 and SUSI 2.5.2, from the SUSI 2.5 Objective *Personal social scenarios and strategies to cope.* The sub-codes added to Category 4: Talking about monitoring can be seen in the final MCF in Table 13.

4.1.2   Revisiting the critical case for examples of the new codes

On re-examining the critical case, one example of the new MCF code 1.7 was found. The example involved explaining what a thinking bubble was and had been coded as talking about task materials (MCF code 1.2) as it involved talking about post-it notes in the shape of thinking bubbles. The code 1.7 *explaining vocabulary* was considered more suitable and this section was re-coded.

One example of the new code *4.1.6 SLT asks the child to monitor the links between feelings and events* was found in the critical case. In activity SUSI 1.1.1: *Descriptions of social contexts*, the SLT draws the child's attention to the relationship between a girl dropping her ice-cream and feeling sad. This short section had been coded as part of a longer section as MCF code *3.6.1 the SLT models the strategy* (of telling what happens in stories). This section retained its original code and the new code of 4.1.6 was added to the shorter excerpt.

The MCF as it was after coding case 2 was able to capture all of the metacognitive content of the remaining six recordings and no additional codes or sub-codes were added to the MCF. As analysis progressed, thematic charts for each category were created with examples from each case where applicable. An example of a thematic chart was presented in Table 10 in section 3.4.3 .The final version of the Metacognition in SLT Coding Framework is presented in the next section, containing the new codes from case 2 and illustrative examples of each code from across the data set.

4.2 The Metacognitive Coding Framework (MCF)

The final MCF retained the original four categories as shown above in section 3.4.1.2:

Category 1: Talking about tasks

Category 2: Talking about prior knowledge

Category 3: Talking about strategies

Category 4: Talking about monitoring

Each category had a set of codes and sub-codes. For example, for Category 1: Talking about tasks, two of the codes within tasks are 1.1 naming tasks and 1.2. Talking about task materials; sub-codes within 1.1 are 1.1.1 using specific names for tasks, 1.1.2 using non-specific names for tasks and 1.1.3 CHILD names a task. The full MCF with the most illustrative examples from across the data set studied is shown in Table 13.

Table 13: The Finalised Metacognitive Coding Framework

Category 1 Talking about tasks		
Code and sub-code with reference numbers		**Example to illustrate**
1.1 naming tasks	1.1.1 using specific names for tasks	*And what you and I are going to do today, we're going to think about good listening*
	1.1.2 non-specific names for tasks	*We're going to do lots of nice things today, shall I tell you what we are going to do?*
	1.1.3 CHILD names a task	*Child: Good listening*
1.2 talking about task materials		*Ok so today, we've started thinking about our friendship book and you've got some homework in your word wizard book as well.*
1.3 explaining how to do tasks	1.3.1 instructions that use the strategy name	*Ok. So we're going to make a list of bits of information that are important to help us work out what's happening. And that's going to go in the 'relevant' column. And bits of information that don't help us to work out what's happening can go in the 'irrelevant' column.*
1.4 repeat the task to practise the strategy		*So, you were thinking about the work [points at icon on chart]. Let's try one more. This time do you think you can listen for the word 'cat'?*
1.5 role-reversal		*Do you want to try to help Sheep be a really good listener?*
1.6 talking about task demands		*Child: Too much pictures.* *Child: It's too much, I can't do that.*
1.7 explain vocabulary to complete the task		*Child: What are hobbies?* *Hobbies are things you like to do* *Child: Football?* *Yeah, football, dancing,* *A hobby is not just something that you like, it's something that you do as well.*

Table 13 continued
Category 2 Talking about prior knowledge

Code and sub-code with reference numbers		Example to illustrate
2.1 find out what the child knows by asking	2.1.1 about the current task	*Do you know about listening? What do you have to do when you are a good listener?*
	2.1.2 about the strategy being practised	*And I can see in this picture some chairs. Do you think they are relevant or irrelevant?*
2.2 CHILD states what they know	2.2.1 prior knowledge is present	*Child: Listening, you got to look at the teacher*
	2.2.2 prior knowledge is absent	*It helps us work out what's happening in the picture, doesn't it? Do you think the swimming pool is important to help us work it out?* *Child: No.* *No? So if we had no swimming pool there, would we know what was going on?* *Child: No* *No. So it is important, isn't it?*
2.3 feedback to the child on what he/she stated / know	2.3.1 using the task or strategy name	*That's right, so, what, you just said, 'good looking'.*
	2.3.2 feedback that describes what the task or strategy is not	*We don't put them under the desk [models and taps fingers]* *Child: Look at that [referring to his hand shapes]* *We don't put them in our pockets [models]* *We don't put them in our bag [reaches for bag]*
	2.3.3 that uses a visual representation of the strategy	*No, that's right you don't know, so you hold onto that card [gives symbol for I don't know]. Wait a second. You don't know. That says 'I don't know'.*
2.4 explain the link between prior knowledge and the task		*You said, you've got to look at the teacher, good thinking. So when we are together and when you are listening, you will be looking at me won't you? And when I am listening I will be looking at you.*

Table 13 continued
Category 3 Talking about strategies

Code and sub-code with reference numbers		Example to illustrate
3.1 naming strategies	3.1.1 SLT names the strategy	*So, instead of saying exactly what she wants and needs to her friend, she's hinting at it. And when we don't say exactly what we mean, but we hint at it, that's called indirect speech.*
	3.1.2 CHILD names the strategy	*What's he thinking about?* *Child: He's thinking about the pages.* *Brilliant, he's thinking about the pages.*
3.2 describing a strategy by what it is not		*He wasn't keeping his hands still. [puts Sheep's hands back in box] He was fidgeting. That's called fidgeting, isn't it?*
3.3 SLT explains steps in strategies		*And how can we work out what people feel?* *Child: By their look.* *Exactly, well done. By the look on their face.*
3.4 visual representations of strategies		*He's got to think of a way to be calm while he's at the bus stop.* *Child: looking at a newspaper.* *What a good idea. So you think that the solution is that he has got to think about being calm. And absolutely right, he could read a newspaper. Read the paper. [writes it down] That's solution number one.*
3.5 SLT asks the child to use the strategy		*Show me 'keeping your hands still'.*
3.6 using a strategy correctly	3.6.1 SLT using the strategy correctly	*Well. I'm just wondering what would happen if I was waiting for the bus … I might just think about some of the things that I have to do later that day.*
	3.6.2 CHILD using the strategy correctly	*How many syllables has it got?* *Child: Three. Crash down truck [uses gesture with three fingers]* *That first word, it is something 'down truck' [uses 3 fingers for three words]* *Child: Down truck [uses two fingers to show down truck]* *But what's that first word? Not crash down truck, but it's a* *Child: Take down truck.*

Table 13 continued Category 3 Talking about strategies continued…..		
3.7 using a strategy incorrectly	3.7.1 SLT using the strategy incorrectly	*I think I could either have a look, or I could ask for a clue to work it out. Maybe I could have some guesses.* *Child: I'm not going to tell you* *You're not going to tell me? Can I have 5 guesses?* *Child: Yeah* *Is it a telephone?* *Child: No* *Is it a watch?* *Child: No!* *Is it a pencil?* *Child: No!*
	3.7.2 CHILD using the strategy incorrectly	*Child: [makes puppet fidget and moves puppet to the box]* *Child: I got four toys in my pocket* *Were you thinking about the work? [points to icon on chart] You were thinking about something else.*
3.8 SLT gives praise / feedback / extrinsic rewards to the child for using strategies	3.8.1 using the strategy name	*So look, you're keeping your hand still now. [touches child's left hand, still on the desk].* *Oh no! he's not thinking about the work.* *Always angry are they? Where is your thermometer? [gets book of feelings] let's see where it might take you.* *Angry. You look angry even now, just thinking about it.*
	3.8.2 using a visual representation	*No so we've got to think 'there's nothing…* *Child: …to do* *I can do. [writes] there is nothing I can do about this. If we had a big rubber we could rub the traffic lights out, but can we do that in real life? [shakes head]*

Table 13 continued Category 3 Talking about strategies continued…..		
3.9 SLT links the strategy to the task		*So the clue is how many candles. The question is, 'how old is the boy?' and the clue is the number of candles. That's the clue, that's how we work it out. So we always have to look to work it out.*
3.10 SLT asks/tells why the strategy is important		*You were thinking about something else.* *Child: [nods and smiles]* *You were thinking about toys in your pocket. So you missed the [shows picture of hat to child]* *Child: Hat* *I did feel happy. [draws happy against list for clues] Is it a good idea to guess and get all of those wrong answers and sad faces, or is it a good idea to ask for a* *Child: clue* *It's a good idea to ask for a clue. I think so. Cos look, I did 1,2,3,4,5 guesses all wrong [gesture all wrong] and you gave me 1 clue and how did I feel* *Child: Happy* *Because I know. I think it's a good idea to ask for help when we're a bit stuck.*
3.11 SLT asks child to use strategies in new task (using multiple strategies)		*So all the way through telling stories, we're going to be looking at the pictures [pointing at each icon on chart], sitting still, keeping our hands still.*
3.12 SLT links strategies to wider experience		*So even if we are sitting on the carpet, sometimes do you sit on the carpet?* *Child: Yeah* *And can you sit without wriggling?* *Child: Yeah [stops wriggling and turns to SLT]* *Very good, so sitting still. So even if you are on the carpet.*

Table 13 continued Category 4 Talking about monitoring		
Code and sub-code with reference numbers		Example to illustrate
4.1 self-monitoring strategies	4.1.1 SLT asks child to monitor his own use of the strategy	*Were you thinking about playtime?* *Child: [shakes head]* *You were thinking about the* *Child: Work*
	4.1.2 CHILD comments on his own use of strategies	*Child: [points to the thinking about the work icon] What about this?* *Oh yes, you were thinking about the work weren't you, and you were looking at the pictures and you were sitting beautifully* *What were you thinking about?* *Child: I was thinking about listening*
	4.1.3 SLT asks child to monitor their own comprehension	*What I want to do is I want to think about routines and accidents. Do you know those words? What does routine mean?* *Child: [nods, reading friendship book] A routine means you, like, stick together.*
	4.1.4 child monitors his own comprehension	*Can you draw someone's hand for me? Just here. This is our picture that we're making.* *Child: I'm going to copy yours?*
	4.1.5 child monitors his own feelings	*They (balloons) might pop* *Child: Yeah and I'm scared* *Is that why you don't like them?* *Child: Yeah*
	4.1.6 SLT asks CHILD to monitor the link between feelings and events	*It's really normal to be a little bit scared of balloons….* *Child: Yeah* *But do you think it's a reason not to go to a party if there might be balloons? Or do you think you should still go?* *Child: I think I could still go*
	4.1.7 CHILD explains the links between feelings and events	*Child: On a doorway near the door there was pop and it was close to my mouth and I nearly cried. I didn't*

Table 13 continued Category 4 Talking about monitoring continued…..		
4.2 monitoring others	4.2.1 SLT asks CHILD to monitor someone else using a strategy	*He looks angry doesn't he? What is this lady thinking?* *Child: Sorry, I need to look at these.* *She doesn't know that he is angry. Is she looking at his face? Has she got the clue?* *Child: [shakes head] No* *No, she hasn't got the clue has she? So she's thinking [writes] I need to do my*
	4.2.2 CHILD comments on someone else's comprehension	*Child: What is Sheep thinking now?* *Child: You're not a good, you're not a good guesser are you?* *Not really*
	4.2.3 SLT asks child to monitor someone else's comprehension	*Do I know what's in the box?* *Child: No* *I do [smiles nods]* *Do I know what's in your box?* *Child: No* *No I don't know.*
	4.2.4 SLT asks child to monitor someone else's feelings	*I don't like it. So that is what he is thinking.* *Child: [reaches for pen] I want to do the face, I want to do the face* *What is the face? What's the feeling with that sentence?* *Child: [draws]* *Oh, is that a worried or angry?* *Child: Angry* *He looks angry doesn't he?*
4.3 SLT gives feedback on monitoring		*Do you know what's in my box or do you not know?* *Child: I not know* *You don't know, that's right.*

4.3 Main themes of metacognition in SCIP Speech and Language Therapy

Results from the thematic analysis of metacognition in SCIP therapy will be presented in two parts. Main themes of metacognitive knowledge are reported in section 4.3 before findings related to metacognitive monitoring and control are presented in section 4.4. Together these reports address the main purpose of the study, to determine the nature of metacognition in SCIP SLT therapy.

Metacognitive person, task and strategy knowledge are dealt with separately in sections 4.3.1 – 4.3.3. Ways that metacognitive monitoring and control were present in the SCIP data are reported in section 4.4. A model of the therapy process in SCIP is presented as a synthesis of the main way that metacognition was seen to operate in the data in Figure 5 in section 4.4.

4.3.1 Metacognitive person knowledge in SCIP therapy

Metacognitive person knowledge is the ability to reflect on one's own knowledge base, one's strengths and weaknesses and on what others might or might not know. It also includes an understanding of thoughts and feelings and is an important part of being able to recognise when one needs to use a repair strategy. This section aims to report examples of metacognitive person knowledge as a novel finding.

4.3.1.1 Learning mental state verbs to talk about knowing and not knowing: monitoring person knowledge (self)

The tasks LP 5.1.1 and LP 5.1.2 were designed to teach four mental state verbs: *know; don't know; guess; and work out*. The interaction between the RSLT/ThA and the child provided the vocabulary to explain each mental state as it was being experienced.

> *Well, I put something in the box, so no peeking. Do you know what's in my box? [prompts: 'No' using facial expression and shakes head]*
>
> *Child: No*
>
> *No, that's right you don't know, so you hold on to that card [gives symbol for I don't know]. Wait a second. You don't know. That says 'I don't know'.*

> (Case 1 session 1 LP 5.1.1)

Teaching the concept of guessing and experiencing its effect was integral to the activity LP 5.1.2.

> *Child: Is it a sandwich?*
>
> *No, so I need to give you a clue.*
>
> *Child: Is it cheese?*
>
> *Are you guessing? Shall we have a go at guessing? Let's see how good it is to guess. I'm going to give you 5 guesses because you might be lucky. 1,2,3,4,5.*
>
> *Child: Is it? Is it? Is it a piece of chicken?*
>
> *Piece of chicken, sorry it's not a piece of chicken. Have another go…*
>
> *Child: Is it attend [pretend] sandwich? [gesture hands wide apart]*
>
> *Pretend sandwich [writes on list]. Sorry that's a good guess but that's not right.*
>
> *Child: Aww, is it ….*
>
> (Case 1 session 1 LP 5.1.2)

The strategy 'work out' the answer from a clue was taught.

> *One of the other things that you could do to find out is, you can ask for a clue [writes 'ask for a clue' on chart]. Shall I give you a clue?*
>
> *Child: Yeah*
>
> *This, in my box there is something that you can read.*
>
> *Child: Is it newspaper?*
>
> *No it's not a newspaper. What do we read in school?*
>
> *Child: Books?*
>
> *[smiles, points to chart and puts a tick by symbol for working it out] I think you worked it out. Let's see if you are right [opens box]*
>
> *Child: Yes, a little book.*
>
> (Case 1 session 1 LP 5.1.2)

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Metacognitive person knowledge was explicit in discussion with children in activities from other sections of the SCIP manual and examples are reported here from LP, PRAG and SUSI activities at different time-points in delivery. For example, children were asked whether they knew specific vocabulary.

What I want to do is, I want to think about routines and accidents. Do you know those words? What does routine mean?

(Case 5 session 15 SUSI 3.1.1)

Do you know what this is called? Do you know what they are playing on?

Child: No

No? It's called a Li-lo.

(Case 3 session 14 SUSI 4.2.1)

When children failed to understand, vocabulary and strategies taught in LP5.1.1 and LP5.1.2 were used to help them reflect on their knowledge and what they could do to understand.

And if I say, oh that looks like fun. What do I want?

Child: You want to open the window as well.

No, have a listen to the question. [points to listening chart] If you don't know, you need to ask.

(Case 2 session 11 PRAG 5.3.1)

Now, what do you do when you don't know what to do? When you find it difficult, what can you say?

Child: Please can you explain it?

Please can you explain it? Or I don't know what you mean. Or please can you help me? Yes.

(Case 4 session 16 LP 4.2.3)

4.3.1.2 Talking about what other people know: monitoring person knowledge in others

Children were also engaged in discussion about what others may be thinking or feeling.

Role reversal provided the opportunity for the child to talk about what others know.

Would you like to hide something? ….Do I know what's in your box?

Child: No

No, I don't know. Do you know?

Child: Yeah

Yes you do

(Case 1 session 1 LP 5.1.1)

RSLT/ThAs explained to children how to think about other people's thoughts and feelings.

So when she says "That looks like fun!" what could she be thinking?

Child: [no response]

What's the boy doing?

Child: Playing on his bike.

Hmmm. And she likes the look of that. She thinks that might be fun. So what do you think she wants to do?

Child: Play on it.

Yeah, so she's thinking "I want to play on the bike."

(Case 3 session 14 PRAG 5.3.1)

Feelings related to different states of knowing, not knowing, guessing and working out were made explicit.

> *(after three wrong guesses)…Is it a pencil?*
>
> *Child: No!*
>
> *[SLT marking guesses wrong with an 'x' and draws a sad face next to the 'x'] Oh, I feel a bit sad now.*
>
> *Child: Yeah [very quiet, looks at RSLT with concern]*
>
> *I'm beginning to feel a bit sad now because my guesses are wrong*
>
> *Child: Oh*
>
> *Is it some music?*
>
> *No!*

The child was asked to monitor the RSLT's feelings after repeated guessing.

> *Oh! How do I feel at the end?*
>
> *Child: Sad!*

> (Case 1 session 1 LP 5.1.2)

4.3.1.3 *Learning what to do when you don't understand: metacognitive control of person knowledge (self)*

Strategies to repair breakdown in comprehension were modelled and the benefit of using a strategy was made explicit. In this extract the RSLT modelled asking for a clue and the effect on feelings of getting the answer right.

> *Well, let's try a different way. Let's try working it out. Ready? So I want you to give me a clue and we can have five clues and let's see how I feel.*
>
> *Child: You do this [holds hands together and shakes them] and you got to count the numbers.*
>
> *Oh, so, it's got numbers on and it's like a cube, and do you use it to play games?*
>
> *Child: Yeah*
>
> *Is it a dice?*

> (Case 1 session 1 LP 5.1.1)

In discussion the RSLT named the strategy and explained the benefits of asking for help over guessing.

> *Did I work it out? [uses 'I know' card as prompt]*
>
> *Child: Yeah*
>
> *I did, so how do you think I felt?*
>
> *Child: Happy*
>
> *I did feel happy….Is it a good idea to guess and get all of those wrong answers and sad faces, or is it a good idea to ask for a*
>
> *Child: Clue*
>
> *It's a good idea to ask for a clue. I think so. Because, look, I did 1,2,3,4,5 guesses all wrong [gesture all wrong] and you gave me one clue and how did I feel?*
>
> *Child: Happy*

The SLT went on to explain the link between using the strategy ask for a clue and her mental and feeling states and explained when the strategy would be helpful.

> *Happy. Because I know. I think it's a good idea to ask for help, when we're a bit stuck.*

> (Case 1 session 1 LP 5.1.1)

The examples presented show that children were taught and prompted to use metacognitive person knowledge to reflect on their knowledge to recognise when to use a repair strategy. Part of learning to use repair strategies involved monitoring other people's failure to understand and seek clarification. Children were also taught how to work out what others were thinking and feeling. Examples of metacognitive task knowledge follow.

4.3.2 Metacognitive task knowledge in SCIP therapy

Metacognitive task knowledge assists one to understand task design and demands. Tasks may be perceived as familiar, achievable, logical or not. In SCIP therapy, tasks were referred to in general terms rather than by using specific names. Terms such as jobs or work were common.

> *Well, and the last one is a big job, we've got to do lots of work.*
>
> *Child: Five, six jobs?*

<div align="right">(Case 1 session 8 SUSI 1.4.1)</div>

4.3.2.1 Naming tasks

Some tasks were given a specific name: working on a *Friendship book* (Case 2); *Good listening* (Case 1); and *Conversations with problems* (Case 5). More often, tasks were described using the vocabulary and concepts being taught rather than by a specific name.

> *Last week, we were thinking about things that can make us sad, or make us happy or make us angry. And can you remember we talked about what happens when someone broke a cup and told a lie?*

<div align="right">(Case 3 session 14 SUSI 2.5.1)</div>

Tasks were described in terms of the demands of the task, the materials needed and a strategy that would help to achieve it.

> *Now today, we're going to start with something you've done a bit of work on. So, I need to find the people that I need first. … So for this, we have to think really, really, really hard. So you might want to close your eyes and picture it in your head as well.*

<div align="right">(Case 4 session 16 LP 4.2.3)</div>

4.3.2.2 Explaining steps to complete tasks

Steps to do tasks were explained alongside a demonstration of what to do.

> *So I want to show you this one, so that you know what we are going to do with these. OK?*

<div align="right">(Case 5 session 15 SUSI 3.1.1)</div>

I wanted to think a little bit more about that today, and your mummy told me that when you get poorly in bed, and when you're not very well, that it makes you sad [ThA drawing picture in notebook] and that's why you've got a sad little face on you there, haven't you?

And you might say, [ThA sticks speech bubble post-it note onto picture] I've got a sore tummy. And you might be thinking [sticks post-it note on and writes] I don't like being poorly. So when you have feelings, you often have thoughts and words that go along with the feelings.

(Case 3 session 14 SUSI 2.5.2)

A full description of the steps in a task was provided at the end. In this example the task is to make inferences about people based on their occupation; the steps in completing the task are the strategies needed to generate a definition and description of people and their occupations.

So we, we've thought about all the different things to try and remember what a mechanic is and what an author is. Think about what it begins with, what group it's in, what they do, what they look like, where you might find them and other things in that group. And also what they might use.

(Case 4 session 16 LP 4.2.2)

4.3.2.3   Task demands
Children and therapists talked about the demands of tasks.

Ok, let's have a go. These are very simple little stories. I think

Child: It's too much, I can't do that

It's not too much.

(Case 1 session 1 LP 2.1.2)

A cup of tea. Well done. That was really quick. You picked out the clues straight away.

Child: it's easy

It's easy when you look at the clues and you work it out.

(Case 4 session 16 SUSI 4.2.1)

4.3.2.4   Task design

Task materials were designed to be familiar to school-aged children and delivered to include opportunities to practise specific skills. For example, pictures of typical family experiences were used to engage the child in an expressive narrative task.

> *Let me tell you a story about going swimming…*
>
> *"They wait until everyone is ready. Mum says, 'Stay behind me, and remember to stop at the red light.'"Ok, so they are setting off.*
>
> *The next thing. "The children have arrived at the pool and they need to buy their tickets. Mum goes to the counter and she says, 'One adult and two" [pause for child to complete]*
>
> *Child: Boys and girls*

Role-reversal was built into task design to provide both modelling of the target skill and opportunities for the children to practise with support.

> *Do you want to tell me what happens?*
>
> *Child: Daddy was drinking his cup of tea and the girl was eating his dinner and the boy was eating and so was mummy.*
>
> *What did they say to each other?*
>
> *Child: Mm, mm, nice*

<div align="right">(Case 1 session 1 LP 2.1.2)</div>

4.3.2.5 Using the child's actual experiences in therapy tasks

Tasks were adapted to include examples of events from the child's actual experiences. In an activity to make inferences about people based on their occupations, the activity used the child's father's occupation (mechanic) as the model for discussion of strategies to generate inferences from other occupations.

> *Now, a mechanic is somebody that you find that fixes cars.*
>
> *Child: Oh, my dad's gone to fix some cars.*
>
> *Is he a mechanic?*
>
> *Child: He just gets the bruises out of them.*
>
> *Ah, so, he [writing] fixes cars. Where do you think you would find him? Where?*
>
> *Child: Errm… at a car shop.*
>
> *A car shop?*
>
> *Child: A car farage… garage.*
>
> *Brilliant! At a garage. That's where he fixes the cars. What does he look like? What do you think he would wear?*
>
> *Child: Old dirty clothes.*
>
> (Case 4 session 16 LP 4.2.2)

Information on actual events in the child's life was provided by teaching staff, parents and children. In the first example, an LSA contributed information to be included in the activity and in the second, the child volunteered details of his usual route to school to add to an activity on routines and changes to routines.

> *That's a new word for me. I've never heard of woggles before.*
>
> *Child: Hmmm.*
>
> *LSA: Can you tell ThA what a woggle is that we use at swimming, when we have fun swim?*
>
> *You'll have to put that in your wordbook and show me.*
>
> (Case 3 session 14 PRAG 5.3.1)

> *Ok, so let's drive. I think I saw your mum this morning.*
>
> *Child: Yeah, she always drives.*
>
> *So there's the car, [drawing] and in the back, there'll be you*
>
> *Child: No I'm not in the back, I'm in the front.*
>
> *Are you? [drawing] There's mummy in the front driving, and you on the other side and your sister is in the back. Is there anyone else in?*
>
> *Child: No.*
>
> *Ok, just you three…..*

After discussion about the child's actual routine a fictional problem is introduced for him to solve.

> *I know, that's your routine, that's right. OK, so once you get in the car, you always drive the same way. But, one morning, [drawing] there are some road works.*
>
> *Child: No! We don't have road works at my school.*

<div align="right">(Case 5 session 15 SUSI 3.1.2)</div>

4.3.2.6   *Including rule breaks in tasks: error-detection and problem-solving*

Tasks were adapted by the RSLT/ThA to present children with a problem to solve as in the extract above, or to demonstrate to children the impact of breaking the communication 'rule' that was being targeted. In the first example presented below, the therapy target is to reinforce the child's metapragmatic awareness of their own listening skills (PRAG 1.1.1). This extract shows how the child was engaged in monitoring another 'person's' skills.

The RSLT operated the puppet to fidget while listening. After the incorrect modelling of the strategy, 'keep your hands still while listening', the RSLT explained what the puppet had 'done wrong' and told the child the name for this behaviour. The child attempted to name the strategy that was needed for the puppet to be successful as a listener.

> *[Whisper to child] what happened there [pointing to hands still on chart]. What was he doing? He wasn't keeping his….*
>
> *Child: Hands*
>
> *He wasn't keeping his hands still. He was fidgeting. That's called fidgeting, isn't it?*

<div align="right">(Case 1 session 1 PRAG 1.1.1)</div>

Pictures depicting others breaking rules were discussed and used as the basis of role play. In this extract, a picture of children not listening in class is discussed then acted out. The child is monitoring the feelings of the teacher in the picture and attempted to explain what would happen to children in his school who are rude in class.

> *How are the people feeling in this picture? …*
>
> *Child: Annoyed*
>
> *Annoyed, the teacher **is** annoyed,…What's going to happen next? …. So the teacher has turned around. You do it. I'll turn around [acting out the scene]*
>
> *Child: [pulls a face and gets caught by ThA, laughs]*
>
> *What's going to happen next?*
>
> *Child: She's going to go to Mrs Barkers.*
>
> *Is that your teacher?*
>
> (Case 4 session 16 LP 4.2.4)

Rarely, in this data, were tasks referred to by name and the children learned how to complete tasks through explanations and demonstrations of the strategies they needed to learn. The RSLT/ThA made adjustments to tasks to focus the child's attention on a particular skill. Tasks were used to teach specific skills and rule breaks were used to teach children to monitor the effect of incorrect strategy use. Role reversal and role play provided the means of practising strategies to enhance language and social communication skills. Examples of metacognitive strategy knowledge follow.

4.3.3   Metacognitive strategy knowledge in SCIP therapy

Metacognitive strategy knowledge is knowledge of what strategy to use, when and how to use it and why it is important (the WWW&H rule). This section starts by reporting the strategies that were explicitly named by the RSLT/ThA before exemplifying how strategies were identified in the transcripts. A list of potential strategy names derived from the RSLT/ThAs utterances is reported as an output from the data management phase of analysis. The section then reports how RSLT/ThAs modelled strategies correctly and

incorrectly in therapy and the metacognitive nature of different types of modelling is illustrated with examples from the data.

4.3.3.1   Strategy names

Where strategies were explicitly named by the RSLT/ThA, they were referred to as rules or things we have to do.

So that's our rules. (Case 1 session 1 PRAG 1.1.2)

So this is the little person and we have to think about what they might be feeling

(Case 5 session 16 SUSI 3.1.2)

Analysis using the MCF provided a means of identifying the name of the strategy being taught in the course of delivering the therapy activities. In general, the RSLT/ThAs did not explicitly tell the child names for strategies, but potential names for strategies were derived from sections of the transcript coded MCF 3.5 SLT asks the child to use the strategy. When this code had been allocated it was possible to see what strategy the RSLT/ThA wished the child to use. The words used by the RSLT/ThA were collated in this phase of analysis as potential strategy names. Table 14 shows how a section of text coded as MCF 3.5 SLT asks the child to use the strategy revealed the phrase 'think about the work' as the strategy name.

Table 14: Coded transcript to illustrate how strategy names were identified

Line Number	Transcript Case 1 Session 1	MCF Code
275	*Do you think you can help Sheep to learn this one [points to icon on chart] think about the work?*	3.5 SLT asks the child to use the strategy
276	*Child: Yeah*	
277	*Think about the words?*	3.1.1 SLT names the strategy
278-279	*Ok, so, this is what we are going to practise. I'm going to read a story [shows child small picture of a hat] and I want you to think about the word 'hat'*	3.9 SLT links the strategy to the task

Repeated RSLT/ThA utterances in the transcripts were examined to determine strategy names for tasks. A sample of strategy names from the critical case are shown in Table 15.

Table 15: Strategy names derived from the data transcript of Case 1 session 1

SCIP Activity	Strategy names
PRAG 1.1.1 Good Listening skills	Look at the speaker (when listening)
	Sitting still (helps when listening)
	Keep your hands still (when listening)
PRAG 1.1.2 Listening for content	Think about the words / work (when listening)
	Look at the work (when listening)
LP 5.1.1 Understanding the concept of knowing and not knowing	What do we do when we don't know?
	Ask for a clue (if you don't understand)
LP 5.1.2 Understanding the concepts of guessing and working out	Work answers out from information you already know
	Ask for help (if you don't know)
SUSI 1.1.1 Making simple inferences from familiar sequences	Look for clues in pictures (to work things out)
	Tell what happens (when telling stories)
	Tell what people say (when telling stories)
	Tell what people feel (when telling stories)
LP 2.1.2 Simple sequencing	Put events in the right order
	Work out what will happen

The strategy 'ask for help' (LP 5.1.2) introduced in session 1, was used in session 14 in activity SUSI 4.2.1 Solving problems in complex social contexts (personalised). The ThA gave information about what strategy to use, when to use it and why it will help.

> So that's a solution for when we get lost. We can ask for help. And then… when we've fixed the problem and find each other we can feel happy again.

(Case 3 session 14 SUSI 2.5.2)

The strategy 'Play with other children' was derived from the therapeutic interaction in Case 4. In this extract the ThA is reviewing the target from an activity, SUSI 5.2.1 Role play of friendship skills, completed in the previous session.

> *Have you tried out playing with other people?*
>
> *Child: I did.*
>
> *You did? What did you play?*
>
> *Child: Um… football. …*

The steps in the strategy are reiterated by the ThA.

> *So did you go over? What did you say?*
>
> *Child: Do you want to play football?*
>
> *Do you want to play football? That was really good… because we talked about that last time, didn't we? Going up to other people and saying, "Please can I join in?"*

> (Case 4 session 16 review of SUSI 5.2.1 from previous session)

The steps in strategies were discussed and modelled through role play and were represented using drawings and symbols. Strategies were modelled to the child correctly and incorrectly in tasks. Sabotage is the term to describe incorrect strategy use or rule breaks. Section 4.3.3.2 reports examples of devising images for strategies with the children. Section 4.3.3.3 shows how steps in strategies were modelled correctly by the RSLT/ThAs and section 4.3.3.4 presents examples of how sabotage was used in therapy delivery.

4.3.3.2   Symbolic representations of strategies

Symbols and drawings were used to help explain what a strategy was, when it should be used and why it is important. Symbols were drawn on a chart in session one.

> *Let's have a talk about thinking bubbles. [RSLT drawing on chart] There is a little person and he is happy, and he is in school, so here's his teacher, and the boy is thinking about his work. So that means he is doing good listening and the teacher is happy.*

> (Case 1 session 1 PRAG 1.1.2)

As new strategies were introduced RSLT/ThAs drew the symbol and explained its relation to the strategy. The second extract shows the child engaging in drawing the symbol with support.

> *So what I am going to show you is a little bubble. It's a new thing, ready? [RSLT drawing] So this is the little person and we have to think about what they might be feeling in a minute, so in their head, so that's their thinking bubble, so what they are doing in their heads, they are giving themselves a message. So we have a speech bubble **inside** a thinking bubble…. Well, what it is, is to help us think that we can sometimes tell ourselves things…. Ok, so one of the things we can do, is we can say to ourselves, 'never…*
>
> *Child: Never mind…….*
>
> *Yeah, it's in a lovely relaxed voice*
>
> *Child: No, it's OK, never mind, I'm calm. OK, I'm calm [using calm voice]*
>
> *Oh, that's beautiful, I really like that. And if your little sister was upset, you would be able to help her calm down, wouldn't you?*
>
> *Child: Tell her to take three deep breaths [writing]*
>
> (Case 5 SCIP session 15 SUSI 3.1.2)

Children were taught how to draw their own versions of symbols for strategies as shown here.

> *So I want you to draw a big thinking bubble and then put a speech bubble on the inside. Make sure there is enough room for your speech bubble.*
>
> *Child: [drawing]*
>
> *Brilliant, perfect.*
>
> *Child: [drawing]*
>
> *Brilliant.*
>
> *Child: That's the best one yet.*
>
> (Case 5 SCIP session 15 SUSI 3.1.2)

4.3.3.3   Using strategies correctly: modelling

This section reports how the RSLT/ThAs modelled strategies correctly using extracts from the data that also illustrate the use of visuals to support strategy learning.

The steps in strategies from SCIP section SUSI 1 Understanding social context cues and LP 5 Comprehension monitoring were explained together in activity LP 2.1.2.

> *So the clue is how many candles. The question is, 'How old is the boy?' and the clue is the number of candles. That's the clue, that's how we work it out. So we always have to look to work it out. [points to the child's listening chart]*

> (Case 1 session 1 LP 2.1.2)

Children were told what strategies they were using and how these were assisting them in achieving the tasks.

> *Child: It's in a café*

> *It is in a café, isn't it? So what are the clues that tell you where it is?*

> *Child: Cos there's drinks, and people, order taking people….*

> *Brilliant. So you are looking at the picture and you are doing some working out as well.*

> (Case 5 session 15 LP 4.2.4)

Strategies to manage feelings were recorded in the child's book of feelings. Here, the RSLT is demonstrating how to use the book of feelings to cope with an upset. Three steps are identified: find a blank page; draw the feeling; and think about what will help you feel calm.

> *If you have a strong feeling like being angry or upset or something,…what you could do is turn to a blank page in your book and you could draw the feeling, draw the big triangle*

> *Child: I remember I drew that*

> *And have a think about what might make you feel calm.*

> *Child: I remember you doing that.*

> *I did draw that didn't I? But you've written nice and quiet.*

> (Case 5 SCIP session 15 SUSI 3.1.1)

Strategies to make friends were recorded in a friendship book. One child's goal of having a friend to stay at his house is included in the activity SUSI 5.1.1 Understanding shared interests.

> *Child: Yeah, cos like, I want a friend to sleep at my house.*
>
> *You want, and what does mum say?*
>
> *Child: Say OK, let's find a friend to sleep.*
>
> *So who do you want to invite?*
>
> *Child: Thomas*
>
> *Have you asked him?*
>
> *Child: Not yet, haven't asked him.*
>
> *Ok so maybe when you are doing your friendship book, when you are asking Thomas about his favourite food and all his favourite music and his favourite games, you could say to him, 'Thomas, do you want to come to sleep at my house?'*
>
> *Child: Yeah*
>
> *And then he could come and stay, couldn't he? Would that be good?*
>
> *Child: [nods]*
>
> (Case 2 SCIP session 11 SUSI 5.1.1)

4.3.3.4   Using strategies incorrectly: Sabotage

Sabotage was used frequently in the data and in all sections of the SCIP manual. Extracts are presented below to show sabotage as it was used in LP, PRAG and SUSI activities. Sabotage was introduced to therapy tasks in three ways; the RSLT/ThA deliberately used the strategy incorrectly, pictures showing others using strategies incorrectly were discussed and the child's naturally occurring failed attempts at using a strategy were reviewed. Sabotage was used to engage the child in considering the effect of strategies on performance, feelings and interactions.

In the first extract, the RSLT models sabotage of the strategy 'ask for help' to show that guessing is less effective than asking for help when you don't know something.

Can I have 5 guesses?

Child: Yeah

Is it a telephone?

Child: No

Is it a watch?

Child: No!

[SLT marking guesses wrong with an 'x' and draws a sad face next to the 'x'] Oh I feel a bit sad now.

Child: Yeah [very quiet, looks at SLT with concern]

I'm beginning to feel a bit sad now because my guesses are wrong

(Case 1 session 1 LP 5.1.2)

The following extract shows how pictures showing difficulties in social interaction were used to engage the child in monitoring the interaction in a complex picture. Role play was used to assist the child in identifying the problem. This extract also shows how strategies from PRAG 1.5.3 Conversations with problems were embedded in the activity LP 4.2.3 Making inferences from complex pictures.

Do you know that sometimes we have conversations with problems? And we sort them out. I'm going to be him and you can be her, OK, are you ready?

Child: Pardon, excuse, hello

Can you just stop squashing me? [angry voice]

Child: Sorr – eee! [angry voice]

Was that a problem?

Child: [nods]

(Case 5 session 15 PRAG 1.5.3 within LP 4.2.3)

RSLT/ThAs also used the child's failed attempts at using strategies correctly as an opportunity to talk about what strategy was needed and why it would be helpful. This extract follows a long discussion about the child's anxiety about birthday parties and specifically his reaction to a balloon bursting at a party he recently attended. The ThA explains the strategy 'keep feelings in proportion' and when to use it.

> *And there were balloons, weren't there?*
>
> *Child: Yeah*
>
> *Did any pop?*
>
> *Child: once … near the door there was pop and it was close to my mouth and I nearly cried. I didn't……*
>
> *So you don't need to feel a 'big nervous', do we?*
>
> *Child: No*
>
> *Just a 'small nervous'*
>
> *Child: Yeah*
>
> *Ok, so let's see if next time there's a party, see if you can, if you can keep*
>
> *Child: Calm*

(Case 2 session 11 SUSI 2.5.2)

In this extract, the ThA explained the impact of not using the strategy 'look at the work' in the task LP 4.2.3 Understanding inferences from words.

> *I have got some more pictures, so this, [pointing at listening skills chart] looking, is going to be very important now. Cos if you're not looking you can't work it out.*

(Case 4 session 16 LP 4.2.3)

In summary, strategy names could be derived from the talk of the RSLT/ThA and some of these names were used by the children. Visual representations of strategies were a feature of the intervention sometimes using symbols and sometimes elaborate drawings that emerged over the activity to represent a communication breakdown or repair strategy. The

need for a repair strategy was taught through introducing sabotage to the task and discussion of the impact on performance, feelings and social interactions. How monitoring of strategy use was observed in the data is reported next.

4.3.4 Metacognitive skills in SCIP intervention: monitoring and control

Metacognitive skills of monitoring and control assist an individual in making changes to their performance for greater success. Metacognitive *monitoring* is the ability to reflect on elements of person, task and strategy knowledge. Metacognitive *control* is the ability to use the information gleaned from monitoring to improve one's use of strategies for maximal performance.

4.3.4.1 Monitoring and controlling of listening skills

Children were engaged in monitoring themselves and others using strategies for listening at all time-points in the therapy period. Three extracts from Case 1 session 1 are used here to illustrate the child: a) monitoring a puppet using strategies for listening to a story, b) controlling the puppet to improve its listening and c) monitoring his own listening skills.

a) monitoring a puppet using strategies for listening to a story

> *What was Sheep looking at?*
>
> *Child: Looking at me.*
>
> *Was he looking at the pictures?*
>
> *Child: No [shakes head]*
>
> *Was he looking at the work?*
>
> *Child: No*
>
> *Was he looking at me, the teacher?*
>
> *Child: No ……*

b) controlling the puppet to improve its listening

> *Ok, Sheep, are you ready next time?*
>
> *Child: Yeah, I am holding onto the face.*

That's a good idea, help him to listen, he needs to look at the work. What's he thinking about?

Child: he's thinking about the pages

c) monitoring his own listening skills

Child: [flicking listening skills chart back and forward across the desk]

Are you keeping your hands still at the minute? Let's have a look. You did really good looking [draws a smile]

Child: Yeah

You did good sitting, sitting still. [draws a smile] What about keeping your hands still?

Child: Yeah

Yeah you did.

So well done, keeping your hands still. What were you thinking about?

Child: I was thinking about listening

You were, you were thinking about the work.

<div align="right">(Case 1 session 1 PRAG 1.1.2)</div>

The final extract in this section shows how the visual chart of listening strategies was used throughout the intervention period to prompt children to self-monitor. This extract is from session 15 (out of a maximum of 20) and shows that this child has learned strategies to be 'ready to listen' and knows the strategy name 'think about the work'.

Shall I find your chart and see whether or not you are ready to listen?

Child: [sits up straight and folds arms and looks at RSLT]

Oh, yes, you look like you are. Sitting up, looking at me, thinking about?

Child: Work

The work. Exactly.

<div align="right">(Case 5 SCIP session 15 SUSI 3.1.1)</div>

4.3.4.2 Monitoring feelings: self and others

RSLT/ThAs used pictures and role-play to teach children how to monitor other people's feelings and their use of social conventions in interactions. In this extract social conventions regarding proximity in interaction and the impact of breaking these conventions are the focus of discussion.

*So we are going to look at their faces and see who is OK and who is not OK. This man **is** having a problem … This woman, what is she looking at?*

Child: She's looking at this piece of paper and checking her work…

And she is standing, how close do you think she is standing to him?

Child: Really close

Is it a bit too close?

Child: Mmhmm, cos he's bending over [bends over]

He is, he's trying to get out of her way.

<div align="right">(Case 5 session 15 LP 4.2.4)</div>

The RSLT went on to explain the impact of standing too close on other people's thoughts.

What do you think he's thinking?

Child: Stop that! [cross voice]

Right. Stop that I don't….

Child: Like it

I don't like it. So that is what he is thinking.

The child was able to monitor and comment on how people feel when others stand too close.

> Child: [reaches for pen] I want to do the face
>
> What is the face? What's the feeling with that sentence?
>
> Child: [draws angry face]
>
> Oh, is that worried or angry?
>
> Child: Angry

<div align="right">(Case 5 session 15 LP 4.2.4)</div>

Children were able to monitor their own feelings and describe, as shown in the second extract, what they could do to help themselves.

> Shall we write that down in your book, under nervous?
>
> Child: Yeah …. I'll find it
>
> Can you tell me what they are? Can you remember?
>
> Child: Mmm, they're like, [gesture hands over tummy] they're like, you get a bit of sadness in your tummy. If it goes up you feel nervous. …..
>
>
> OK, so what do you do when you feel nervous?
>
> Child: [stays quiet, looks up and looks like he is thinking] Like, like, what to do if you're nervous, keep breathing.
>
> Keep breathing, yeah.
>
> Child: Like, close your eyes and keep calm and calm and calm then go downstairs and you won't feel nervous anymore.

<div align="right">(Case 2 SCIP session 11 SUSI 2.5.2)</div>

In the same activity, this child was able to comment on the effectiveness of strategies to stay calm.

> *What about when you are driving to the party … and you start to feel really nervous, and you're breathing slowly and you still feel nervous*

> *Child: Yeah, it doesn't work*

4.3.4.3   Monitoring use of language strategies

Extracts from two video recordings from Case 2 show how strategies for word-finding (LP 1) were used in therapy as needed and how he was engaged in monitoring their effect. In the first extract, the ThA supports the child to use strategies to find the word 'breakdown truck' to complete an activity to teach how to predict the thoughts and intentions of others (SUSI 4.2.1).

> *So, what's this girl thinking?*

> *Child: He's thinking that, he's thinking that the car has broken down. ….yeah, and her mum ring her phone*

> *Who do you think mum's on the phone to?*

> *Child: To the car do you know, what that thing, cross, crash-down truck, not like crash down.*

> *Not crash down, there's another word instead, isn't there?*

> *Child: Oh, I forgot, what is it?*

> *Do you know what it begins with?*

> *Child: [shakes head no] …*

> *How many syllables has it got?*

> *Child: Three. Crash down truck [uses same gesture with fingers]*

> *That first word, It is something 'down truck' [uses 3 fingers for three words]*

> *Child: Down truck [uses two fingers to show down truck]*

> *But what's that first word? Not crash down truck, but it's a ….*

Child: Take down truck?

It begins with a 'b'…. and it rhymes with take

Child: Take, ba, brii …..

Br ake

Child: Break down truck! Aw, I know it.

That's it, break down.

In session 18, the same child is asked to monitor the effect of using the strategy 'think of the first letter' in an activity on understanding inferences:

And does thinking about the first letter help?

Child: Yeah, sometimes, but sometimes, I just don't get it.

4.3.4.4 *Monitoring social interactions: self and others*

Task materials were created to simulate the child's recent experiences of interaction difficulties. The extracts presented here show how a therapy activity had been designed to simulate a recent example of an upset in social interaction. As the activity progressed the task integrated details of an actual breakdown in the child's social interaction. For continuity, the series of extracts are all taken from Case 1 session 8 activity SUSI 1.4.1 Solving problems in recent personal social situations.

Do you remember the two boys and they were fighting about PlayStation, weren't they?

Child: PlayStation, yeah

Can you remember we had a sad ending, because, look, how is everybody feeling here?

Child: Angry

The RSLT then explained that the goal of the current task is self-monitoring.

Now we've got to draw a story that happened to you on Saturday….What happened to you at your house on Saturday? … Well I'm going to draw the same picture as we've got, one of these big pictures, and I know …

Child: [interrupts RSLT] Frustrated.

Frustrated? Is that how you were feeling on Saturday? I think it was as well wasn't it? …. So here's you and you're a big brother just like in the story….. And here's Fred. Who is Fred?

Child: [points to page] Freddie, my brother..

Your brother. So here's a F for Fred and a J for Jamie, and how are those two boys feeling?

Child: Frustrated

The RSLT prepared the task materials with the child's input.

And here is a hot wheels car. Have you got a hot wheels car?

Child: Yeah

And who has a hot wheels fire engine?

Child: Me and my brother.

The problem was discussed and the child asked to monitor his feelings and behaviour.

Did you pull Freddie's hair?

Child: No. I just annoyed him.

You just annoyed him

Child: Yeah ..

Right, so one of the sad endings would be like that [shows picture of PlayStation fight]. Look at those children, angry faces. So, kicking. I wonder if anyone kicked anybody? Did anybody get kicked?

Child: Yeah

The RSLT asked the child to monitor other people's thoughts and feelings and words. The child added words and facial expressions to the task materials.

> *So that's one sad ending, a big fight. What would mummy say?*
>
> *Child: Mummy say don't be a naughty boy.*
>
> *Did she, how did she feel?*
>
> *Child: Sad.*
>
> *Do you want to draw a sad face for mum? And mum says please stop… what does she say?*
>
> *Child: Stop doing it ….*
>
> *So that's one of the sad endings.*

Problems were discussed by referring back to the task that had used a simulated account of the child's experience.

> *So that's a bit like the boys fighting over the PlayStation, isn't it?*
>
> *Child: Yeah*

The simulated account was used to provide a model for solutions in the real experience and strategies for resolution of the problem are named.

> *How did our boys over here make a happy ending? Can you remember?*
>
> *Child: [continues to draw]*
>
> *[looking at pictures from previous story] Right, so what did they do? We have two ideas on here, do you remember? One of them is we have to take …*
>
> *Child: Turns*
>
> *Take turns, and one of them was we play nicely with our …*
>
> *Child: Toys*
>
> *With our own toys.*

The RSLT returned the discussion to the child's actual experience.

So … what would be a good idea for you and Fred? How could you make a happy ending?

[role play swapping pencils]

So that's how you're going to be sharing at home. You're going to be saying can we swop? Can we share? So that means you have the fire engine, the ladder, and you feel …

Child: Happy.

And Freddie has ….

Child: Hot wheels.

He has hot wheels and how does he feel?

Child: Happy.

Yeah he does, because that's a happy ending. What does mum think? Let's draw mum in the corner

Child: Happy

Yeah, what will she say? You are playing …

Child: Nicely.

That's right, she will. She'll say you are playing nicely.

(Case 1 session 8 SUSI 1.4.1)

RSLT/ThAs were sensitive to children's response when discussing details of recent upsets. This extract shows how the RSLT increased the focus on the simulated events when the child became upset.

> *But, one morning, [drawing] there are some road works.*
>
> *Child: [interrupts RSLT] No! We don't have road works at my school.*
>
> *I'm just thinking of a pretend situation, like the batteries, and like the man getting the bus.*
>
> *Child: [looks cross] No.*

<div align="right">(Case 5 session 15 SUSI 3.1.2)</div>

The following extract shows how the simulated situation enabled the child to talk about their actual experience.

> *This is another story that is talking about an upset to routine. A diversion….*
>
> *Child: but we can't go on a different way.*
>
> *Is that what you are thinking?*
>
> *Child: We can't go a different way. We can only go the same way to school, else we'll be late.*
>
> *Ah, that is exactly what **these** children are thinking.*
>
> *That's what these children are thinking, Oh no,*
>
> *Child: [interrupts SLT] Not children, mum and me and my sister!*
>
> *And what is the feeling that needs to be in that thought bubble?*
>
> *Child: [takes pencil and draws] My family are always angry when this happens*

The SLT then made it clear that this task was about the child's real experiences.

> *Has it sometimes happened that you are late?*
>
> *Child: [agitated and looks cross] Sometimes happens when my mum wants to go to Tesco.*

<div align="right">(Case 5 session 15 SUSI 3.1.2)</div>

4.3.4.5 Self-monitoring in real-time: using the child's mistakes to promote repair

Children were taught to notice when they had failed to use a strategy. The ThA in this extract explained to the child that he had not used a strategy to signal a new topic (PRAG 4.2.1) and explained the impact of this on the interaction with her.

> *How did we start talking about wrestling?*
>
> *Child: By playing PS2 wrestling.*
>
> *Because we were talking about noise weren't we?*
>
> *Child: Yeah, when when, [gestures and mock screams]*
>
> *Ok, and I said, you didn't like noise, but there was noise at Thomas's party and you had a good time. And then, you started to tell me all about the game and how you were making the noise. I got a bit lost because I didn't know what you were talking about.*
>
> *Child: Right*

The ThA modelled and explained the strategy that will repair the problem.

> *So if you were going to tell me about the wrestling game on the PlayStation you need to say, 'The reason we were making lots of noise was this really noisy game'.*
>
> (Case 2 session 11 using a strategy from PRAG 4.2.1 in SUSI 2.5.2)

Examples of metacognitive monitoring and control presented above illustrate that this was an explicit feature of SCIP intervention. Throughout the intervention period children were engaged in monitoring their use of skills both when strategies had been used correctly and incorrectly. Some children did not rely on pictures and drawings to assist them in reflecting on how they had used strategies and some could reflect in real-time with the RSLT/ThA on their skills. Children were engaged in self-monitoring by creating task materials to represent recent events in their lives when they had failed to use a specific strategy.

4.4 Manipulation of task demands: metacognition in Speech and Language Therapy

Detailed reporting of metacognition in the SCIP intervention delivery and content in Section 4.3 permitted deeper processing of metacognition in relation to therapy tasks, goals and therapist actions. Through repeated reading and interpretation in analysis, relationships between these components were identified and changes in task delivery through changes in materials or therapist actions came to be understood as associated with changing task demands. Tasks were found to be delivered in different ways to teach skills or teach monitoring skills.

The ways in which tasks demands are manipulated by the RSLT/ThA are viewed in this analysis as the sources of teaching communication skills and building monitoring (of self and others) into therapy tasks. A model was developed to explain how tasks can be manipulated and is presented here as a synthesis of the overall nature of metacognition in SCIP SLT.

Figure 5, below, aims to show the therapy task as a construct which has design variables represented on the x and y axes, and task demands within each of the four quadrants (Q1-Q4) expressed as the intervention goal. The RSLT/ThA role and possible therapy materials are also shown. Task variables are: adding or removing details of actual communication and interaction breakdowns (x axis) and adding or removing error detection by presenting strategies used incorrectly or correctly (y axis). In general, adding sabotage promotes monitoring and problem-solving skills as shown in quadrants Q3 and Q4. Adding details of the child's actual performance changes the therapy targets to include self-monitoring and learning to self-repair (Q4). If skills can be said to be acquired in therapy separate to developing the skills to monitor their use and effect, then this takes place in Q1. Role reversal in Q2 provides the context for the child to practise using a new skill. Therapy goals, method and materials are presented in Figure 5 along with the RSLT/ThA role for each of the four task design options. This model is considered to represent a theory of SCIP therapy derived from thematic analysis of metacognition in both the content of the therapy activities and in the interaction between the RSLT/ThA and the child during delivery.

Interpretation of this model and the insights gained into task design, demands and manipulation within the process of delivering SCIP therapy will be presented in the Discussion in Chapter 5.

Figure 5: The SCIP therapy process of modification of task design and delivery variables

SLT or child is using strategies correctly

Skills Acquisition Q1	Skills Acquisition Q2
Goal: Learning what strategy to use and how	Goal: Learning how to use strategies
SLT role: modelling the strategy	SLT role: give feedback on strategy use
Method: Role play	Method: Role reversal
Materials: visual representations of skilled use of strategy	Materials: visual representations of skilled use of strategy
	Self-monitoring
	Engage child in monitoring own successful performance

Not using real events in therapy tasks   Using real events in therapy tasks

Monitoring others Q3	Self-monitoring Q4
Goal: Learning how to detect errors in other people's strategy use and learning what repair strategy to use, when and how	Goal: Learning how to detect errors in own strategy use and how to use repair strategies
SLT role: incorrect modelling of the strategy (approximating child's errors)	SLT role: give feedback on strategy use
Method: Role play plus sabotage	Method: Role reversal plus sabotage
Materials: visual representations of inaccurate use of strategy by others	Materials: visual representations of inaccurate use of strategy by the child in a genuine context

SLT or child is using strategies incorrectly

Examples of intervention from each of the four quadrants of this model have been presented in the Results chapter. The intervention present in Q1, teaching a new skill, is represented by the extract from Case 3 session 14 on page 99. An example of therapy from Q3, which also shows the SLT moving between self- and other-monitoring (Q3 – Q4), is provided on page 121 (Case 5 session 15). Learning how to use strategies (Q2) is exemplified by Case 2 session 11 pages 116-117). Sufficient data have been found to claim that self-monitoring of skilful strategy use is present in SCIP delivery, seen here in Q2 and shown below a dotted line (see example Case 1 session 1 page 113). It may be that self-monitoring of skilful behaviour preceded self-monitoring of errors, but this is not clear from the data available. In SCIP, the child's errors in performance were the focus of discussion in two ways: either as spontaneous feedback from the SLT/A on faulty use of a specific strategy in real-time, or by adding details provided by parents or school staff. For examples of therapy from Q4 see extracts from Case 2 session 11 (page 122) and the extended report from Case 1 session 8 in section 4.3.4.4 on pages 117-120.

4.5 Summary of main findings

Metacognition was a key component of the therapy process and was employed to develop the children's ability to monitor language, pragmatic and social interaction skills in themselves and other people. Therapy tasks were adjusted by the RSLT/ThA to focus on skills acquisition or metacognitive skills of self- or other- monitoring. SCIP therapy agents changed the task design and delivery to include a particular focus on self-monitoring as a distinct part of the SCIP therapy process. When error-detection was included in tasks, children were engaged in metacognitive monitoring of that particular communication behaviour. When details of actual events in the children's lives were included, the children were learning to self-monitor; details of actual breakdowns in communication and interaction provided opportunities for the children to practise self-monitoring and repair. Therapy tasks included explicit reflective discussion and problem-solving of real examples of the child's communication and interaction difficulties, that is, SCIP therapy tasks provided a rich metacognitive experience for the child to learn the WWW&H rule for targeted language and social communication skills.

In these data, metacognitive person knowledge of self and others was an explicit theme running through the interactions between RSLT/ThA and each child. Children were engaged in talking about what they knew about their own knowledge and what they could work out about other people's mental states. Discussions between the RSLT/ThA and children with PLI contained explicit references to the mental and feeling states of the child, the therapist and people in scenarios presented as part of the task. In these data, discussion about person knowledge of self and others was present in activities from LP, PRAG and SUSI for children with and without LI and ASD and in sessions throughout the intervention period.

Metacognitive task knowledge for SCIP activities was largely implicit in the interaction between RSLT/ThAs and children with PLI. Tasks were infrequently named and were usually referred to as jobs or work. Explanations of how to do tasks were integrated with modelling by the RSLT/ThAs and the steps in tasks were the strategies needed to complete the task successfully. Task demands were expressed by children in terms of whether they found the tasks easy or hard. Role-play was used in tasks to show communication and interaction skills being used correctly and incorrectly.

Tasks were designed to include familiar routine experiences, communication rule breaks and other information relating to the child's actual experiences. Children's real experiences were introduced to tasks and served as the context in which the children were practising specific strategies and understanding why they were important. Metacognitive analysis of tasks as delivered in SCIP provided the main means of understanding the nature of metacognition in SLT and is returned to in a discussion of Figure 5 in Chapter 5.

Metacognitive strategy knowledge was also largely implicit in the interaction between RSLT/ThAs and children with PLI, except in those activities designed to teach metapragmatic listening skills and comprehension monitoring (PRAG 1 and LP 5). In these activities, strategy names were used repeatedly by the RSLT/ThA and children were observed at different time-points in the data to use these strategy names to talk about their own and others' behaviours. While strategy knowledge was largely implicit in the data, analysis using the MCF revealed potential strategy names for different tasks from the language used by RSLT/ThAs and children with PLI. Deriving names for strategies provided the means to see where multiple strategies were being targeted in activities and showed that the listening and comprehension monitoring strategies developed in PRAG 1 and LP 5 were integrated as core skills throughout the intervention period.

Strategies were modelled and explained using the steps required to complete them. RSLT/ThAs were observed to use sabotage to engage the children in monitoring strategy use. When RSLT/ThAs deliberately made errors in using a strategy, children were expected to detect the error and understand the impact of incorrect or absent strategy use through discussion and explanation. Children's failed attempts at using strategies in sessions were used as opportunities to reflect on what they needed to do differently. Although largely implicit in these data, it was possible to see that discussion about strategies did take place and was used to engage the child in monitoring their ability to use a strategy, or not, and notice how this affected their performance.

Metacognitive skills of monitoring and control were revealed as an explicit theme in interactions between RSLT/ThAs. Error-detection and correction were re-conceptualised as having a metacognitive function and this allowed the data to reveal the nature of metacognition in SCIP therapy content and delivery. Sabotage had been written into activities and was used to develop the children's ability to monitor language, pragmatic and social interaction skills in themselves and other people. By applying strategies taught in therapy sessions, the children learned to control strategy-use for enhanced performance.

Opportunities to self-monitor also arose when the RSLT/ThAs used the children's failed attempts at using strategies. Scenarios actually experienced by the child were used in tasks to provide opportunities for self-monitoring; scenarios using similar events were used to enable the child to monitor others using a strategy (or not), and its impact on success. Metacognitive self-monitoring and control was found to be present when sabotage and personal information were included in task design and delivery.

The definition of metacognition adopted for this study as the ability to monitor and control person, task and strategy variables in tasks has been demonstrated in this summary of the main findings in that it is difficult to talk about metacognitive knowledge and skills as distinct components. The following chapter discusses the main findings and uses this definition so that, unless specified, the term metacognition will be used to refer to the monitoring and control of person, task or strategy knowledge as needed to succeed on a given task.

5 Discussion

This chapter aims to summarise and discuss the results of the thematic analysis carried out in this thesis. A discussion of main findings in light of what is currently known about metacognition in SLT delivery and with reference to current theories of therapy follows. The implications of metacognition as a component of therapy are discussed in relation to mechanisms of change and the available options for achieving generalisation. Findings from this analysis have helped to clarify the potential place of metacognition in a model of therapy and the dynamic nature of the SLT process. A model (Figure 6) adapted from McCauley & Fey (2006) and showing the contribution of this analysis to understanding components and process of therapy is presented to summarise the nature of metacognition in SCIP SLT. Clinical implications arising from a greater understanding of metacognition as a component of therapy with an influence on the therapy process are presented.

The Metacognitive Coding Framework (MCF) will be discussed in relation to an appraisal of the method used in this study. Steps taken to reduce bias in analysis will be noted and reflections on the role of the researcher as data-generator and data-analyst presented. The benefits of detailed analysis of clinical practice from a theoretical standpoint will be discussed in relation to developing the evidence base for SLT practice. Suggestions for future research following this analysis of metacognition in SLT will be outlined.

5.1 Discussion of main findings

Law et al. (2008) made two claims about metacognition in SLT: firstly that it was a largely implicit component of SLT practice utilised by therapists to develop self-monitoring skills; and secondly, that tasks fell into one of two categories: skills acquisition or metacognitive. Results from the current study support Law et al.'s claim that metacognition is present in SLT and provide evidence to explain how monitoring as a concept and self-monitoring in particular are built into therapy delivery. Detailed focus on the metacognitive content of SCIP therapy activities revealed that, unlike Law et al, therapy tasks can be used to teach a specific communication skill *and* teach the skills to monitor and control its use. This result is more in line with Byng & Black (1995) (Section 2.1.6) who claimed that therapy tasks had dual processing demands: to learn the skill and to self-monitor one's use of the skill. The manipulation of these dual demands of tasks takes place as part of the therapy *process*.

The process of therapy in Byng & Black's model is the interaction between the SLT, the task and the client's performance which is focussed on adjusting the task and the therapy goal to ensure that the individual is making progress. Although not writing about a developmental disorder, this description of the therapy process is in line with how paediatric SLTs are said to maintain therapy tasks within the child's Zone of Proximal Development (Paul & Norbury 2012). Tasks within the child's ZPD are achievable in collaboration with, or with support from a teacher (Vygotsky 1987). Tasks should therefore change as the child gains skill and conclude when the child can self-monitor (Van Kleeck & Richardson, 1986).

Through reflection on the results of this study and the hypotheses put forward by Byng & Black, a deeper understanding and abstraction of the meaning of metacognition as having a function within the therapy process was gained. Three conditions were extracted from Byng & Black's concept of therapy process. Firstly, therapists manage the presentation of therapy tasks for therapeutic gain. Secondly, that the SLT is working strategically with knowledge of the *therapy goals* for the client, the *task materials* that provide the means of focusing on the target *strategies*, and finally, that throughout the interaction the SLT is assessing which aspects of the therapy goal the client has mastered and which remain to be taught. By integrating metacognitive terminology into an understanding of the therapy process, it can be seen that the SLT, whether explicitly or implicitly, has a metacognitive understanding of the client's person knowledge, the task design and demands, and the

strategies that are the targets of therapy. The SLT can further be considered to be monitoring all of these in delivering the task and controlling elements of task design and demands and her interactions with the client to maintain the therapeutic thrust of the interaction towards independent self-monitoring and mastery of skills.

By using the findings on how tasks were presented in SCIP, that is, to include error-detection or not, it has been possible to use data to demonstrate and explain the dual processing of tasks. Tasks with errors in strategy-use by either the SLT or the child were used to promote monitoring skills, i.e. they have a specific metacognitive function in therapy. Further, SCIP tasks had been found to have another particular element in their design: scripts of actual, recent events where the child had failed to use a strategy for language, conversation or social interaction. These findings together with a metacognitive perspective on the therapy process permitted the construction of Figure 5 which positions the therapy task as the vehicle for controlling task demands (therapy goals) in line with the client's independent mastery of the target strategy. That is, Figure 5 is considered to represent the therapy process as it was enacted in the SCIP RCT.

Within each quadrant, the therapy goal, the task materials and the SLT role are represented. As the therapy task proceeds, the SLT observes the child's performance and decides how to respond. Each of the four quadrants in this model of the therapy process represents a response option for the SLT. The SLT has the over-arching option to change the therapy goal or not. The requirement to change the therapy goal arises from observation of the client's performance. Changes to the therapy goal are made by changing the therapy materials and the mode of presentation of the materials from modelling to sabotage. These changes cause the therapy goal to change from skills acquisition to monitoring. The therapy goal becomes concerned with *self*-monitoring and control in discussing actual breakdowns in communication and interactions. The therapy process then is when the SLT is engaged in cycles of observation and adjustment, moving between all four response options in Figure 5 to maintain the over-arching goal of therapy, progress towards independent use and monitoring of new skills.

This over-arching goal of SLT, to learn the target skill and generalise the use of that skill appropriately, is said to be achieved through the therapeutic mechanism of change (Kazdin 2007). Byng & Black (1995) described the mechanism of change in studies of aphasia therapy as the process of making explicit to the client the cognitive and linguistic processes required for understanding the task by engaging clients in "facilitated problem-solving"

(Byng & Black 1995 p312). Veenman et al. (2006) used the WWW&H rule to express the same idea. In Figure 5, Quadrant 1 can be considered to teach *what* strategy is needed, Quadrant 2 to provide the opportunity to learn *how* to do it, Quadrant 3 to illustrate *when* it is required and Quadrant 4 to demonstrate *why* it is important. Thus, the WWW&H Rule can be seen to be present in the SCIP therapy form and process.

Byng & Black had insufficient data to demonstrate that the mechanism of change arose from that part of the therapy process that focuses on problem-solving skills through a conscious and deliberate reflection with the client on the area of difficulty and the skills needed to improve that function. By using video-recordings of actual therapy delivery, the current analysis has been able to provide examples from the data to support this claim. In the SCIP therapy process, the RSLT/ThA taught children *what* language, pragmatic or social interaction skill was needed, *how* and *when* to use it, and *why* it was important by skilfully selecting the most appropriate response to the child's performance from the four quadrants of the model presented above. Quadrant 4 of the model (Figure 5) identifies the therapy target and therapist actions required to bring the child's awareness of their own needs to the fore and develop self-monitoring and self-repair for language and social interaction skills. Therapy tasks in Q4 provided the context for these discussions to take place. Thus, the 'deliberate reflection with the client on the area of difficulty' assumed to be the mechanism of change that will bring about therapeutic change and generalisation can be seen to be being enacted in therapy tasks in Q4.

This analysis therefore has provided a means to conceptualise how metacognition is present as a part of the therapy process in SCIP. Figure 5 shows how the therapy process is enacted by identifying the variables in the task that are manipulated by the SLT and the impact of these variables on the therapy goal, materials and therapist actions. The adjustments made are intended to keep the task within the child's ZPD while working towards independent self-monitoring of new skills. This model of the therapy process as a fluid combination of task design and delivery variables developed from analysis of the metacognitive content of SCIP intervention data has shown how the explicit focus on problem-solving strategies and self-monitoring proposed as the mechanism of change in SCIP therapy is achieved. If therapy delivery in Q4 does represent a mechanism of change in SCIP therapy, it is important to discuss further how therapy within this Quadrant differs from existing expert opinion on utilising different contexts to achieve generalisation.

The context of intervention is construed in models of therapy and expert practice as both the physical and social settings in which the therapy takes place (Fey, 1986; McCauley & Fey, 2006, Paul & Norbury, 2012; Timler et al., 2007) (See Section 2.1). Generalisation of new skills is achieved when the skills transfer into contexts other than the primary therapeutic setting. A comparison of how context is commonly used in SLT to achieve generalisation with the SCIP delivery model has revealed what is considered to be a new way of embedding therapy practice in context.

Four intervention contexts to support school-aged children with SCDs to achieve generalisation were identified from a review of expert practice (Timler et al., 2007). The four contexts for intervention are:

- an environment adapted to provide increased opportunity for social interactions,
- teachers who use specific strategies to enhance social communication in class,
- small group interventions led by the SLT including peers as role models and
- direct intervention delivered by the SLT in a clinical setting.

Timler et al. (2007) (See Section 2.2.3) tested the effect of a therapy that worked across these four contexts in a single case study. Therapy started by training specific skills in a clinic setting using peer role models in small group role play. Through this, a visual checklist was developed which represented the strategies in the order they were to be used. After each clinic session, the SLT moved to the classroom with the child and supported him to engage in interaction with a peer group of his choice by prompting and reference to the checklist of strategies.

A comparison of this expert model of intervention and the model of SCIP delivery has revealed an interesting finding about how the child's context was integrated into SCIP delivery (Q4 in Figure 5). Like Timler et al., SCIP therapy was designed to engage parents and teachers in understanding and supporting therapy targets, and teachers did use strategies in class (Baxendale et al., 2013). Also like Timler et al., visual checklists and children's workbooks containing details of the skills being learned were available for use in the home and classroom contexts. SCIP therapy sessions were, however, exclusively delivered in withdrawal rooms in school, not in the children's classrooms, and puppets and small figures acted the part of peer role models to demonstrate strategies correctly and incorrectly.

An additional consideration then, when understanding how metacognition can be integrated into a model of therapy that includes therapy context as one of the variables, is that, in SCIP therapy, practising new skills in context was achieved in a different way to the four contexts identified by Timler et al. (2007). Using details of the child's recent experiences of communication breakdown changed the task from being a generic context to a highly relevant and specific context. The generic context can be likened to Timler et al.'s clinic-based intervention where the child learns the skills through practice and learns to monitor others through role play, observation and feedback. The highly relevant and child-specific context created by adding details of personal experiences of communication or interaction failure is the SCIP version of delivering therapy *in situ*. In SCIP, this has the same purpose as Timler et al., to enable the child to understand w*hat* skill was required, *when* and *how* to use it and to experience the benefits of *why* this is the right skill to use at a particular point in time. Timler et al.'s context was the concrete experience of using skills in class for peer group entry; the SCIP method provided a virtual experience of the effect of not using targeted skills with the chance to repair that imagined situation through joint working and reflection with the SLT.

It appears, therefore, from this analysis that tasks were designed and delivered to bring the context where the child needed to use the new skills into the therapy room, and not, as Timler et al. did, deliver therapy in the child's context. This is an important new finding in SLT. Timler et al. (2007) showed that their method of using the concrete experience of a real context developed mastery of skill and generalisation for one child with SCD. Generalisation for children with SCDs is an important priority for SLT research and practice, contributing as it could to alleviating the long term negative impact on academic success and social integration currently reported (Timler et al., 2007; Whitehouse et al., 2009; Williams White et al., 2006). No investigation of the generalisation effect of the SCIP therapy method of using context as described has been undertaken. However, if, as may be the case that this element of the therapy process does represent a mechanism of change, it may be important to develop a means to determine its role in achieving generalisation for children with PLI. If evidence could be accumulated to show an effect of delivering therapy tasks to develop self-monitoring in this way, this could provide an alternative means of achieving generalisation for children with SCD, especially for older children whose tolerance for direct support in the classroom may be low.

Within a model of therapy components, the contexts described by Timler et al. (2007) can be arranged on a continuum of most natural to most contrived (Fey 1986; McCauley & Fey 2006). The means of integrating context into therapy as delivered by SCIP is a new development in SLT and its place on this continuum is unclear. However, what is clear from this analysis is that metacognition can be considered to have a position in a model of therapy and an impact on the therapy process.

Metacognition has been found to play a crucial role in learning, but is not described as a learning theory *per se*. However, the role of a learning theory in therapy was raised in an earlier version of McCauley & Fey's (2006) model of therapy (Fey 1986). It is this point, that therapy, by its very nature, is a process of learning which is discussed in a clinical forum devoted to improving clinical practice in paediatric SLT (e.g. (Apel, 2014; Hoffman, 2014; Kamhi, 2014). In a review of evidence across paediatric SLT Kamhi (2014) encouraged SLTs to examine their use of theory in practice for client benefit. He argued that theories of impairment, typical development *and* learning have important roles in explaining and enhancing therapy practice. Apel (2014), like Fey (1986), goes further and claimed that learning theory is "core to one's clinical practice" and as such should be considered as a central component of clinical practice (Apel 2014 p. 104).

The current study may be considered to answer the call from Kamhi and Apel to examine theory in practice, and specifically to explore the learning theory integral to therapy delivery. Kamhi (2014) brings together the positions of Law et al. (2008) that theories of impairment are crucial to clinical decision-making and Paul & Norbury (2012) that developmental norms guide goal selection. The results from this study, in line with the positions of Fey (1986) and Apel (2014) that learning theory is also central to clinical decision-making and the therapy process, suggest that metacognition may be considered to have a role in learning in therapy and therefore may be included in a new model of therapy. This model is presented in Figure 6 below and is adapted from McCauley & Fey (2006) to show how metacognition impacts on the form and process of therapy.

In this model, I propose that the over-arching goal of therapy for all specific targets is the generalisation and independent self-monitoring of skills taught in therapy. In the McCauley & Fey model, Basic goals are the general areas of impairment that will be addressed in therapy. If the general area of impairment can be seen as both the inability to use the skill, and a failure to monitor and control its use, as is implied by the dual processing demands of therapy tasks, it follows therefore that metacognition may have a role to play, along with

theories of impairment and typical development, in how SLTs plan and deliver therapy. Evidence has been documented throughout this thesis to show that metacognition influenced the design and delivery of therapy activities. Further, the method of task manipulation explained by this exploration of metacognition in SCIP therapy showed that a new therapy context was created. A description of the therapy process using metacognitive terms showed that the SLT can be considered to be engaged in a metacognitive analysis of therapy through the acts of monitoring and controlling person, task and strategy variables. An influence of metacognition on the therapy *form* and *process* has been demonstrated through this analysis, that is, metacognition has been seen to have exerted an influence on therapy activities, therapy procedures and the therapy context through the clinical actions of the therapy agent.

In line with new understanding of the therapy process revealed through this analysis of metacognition in SCIP therapy, the shaded components in this adaptation of McCauley & Fey's model represent where metacognition has been found in this analysis to have exerted influence, that is, on the therapy agent, the activities, procedures and context of therapy delivery. Further an interaction between these components has been found arising from the therapy agent's continual, metacognitive, assessment of the child's performance. Modification of the therapy task in response to reassessment in the current proposed model is the modification of tasks from skills acquisition to monitoring and from monitoring others to self-monitoring.

Figure 6: A model of therapy to show metacognition as a component of clinical decision-making adapted from McCauley & Fey (2006)
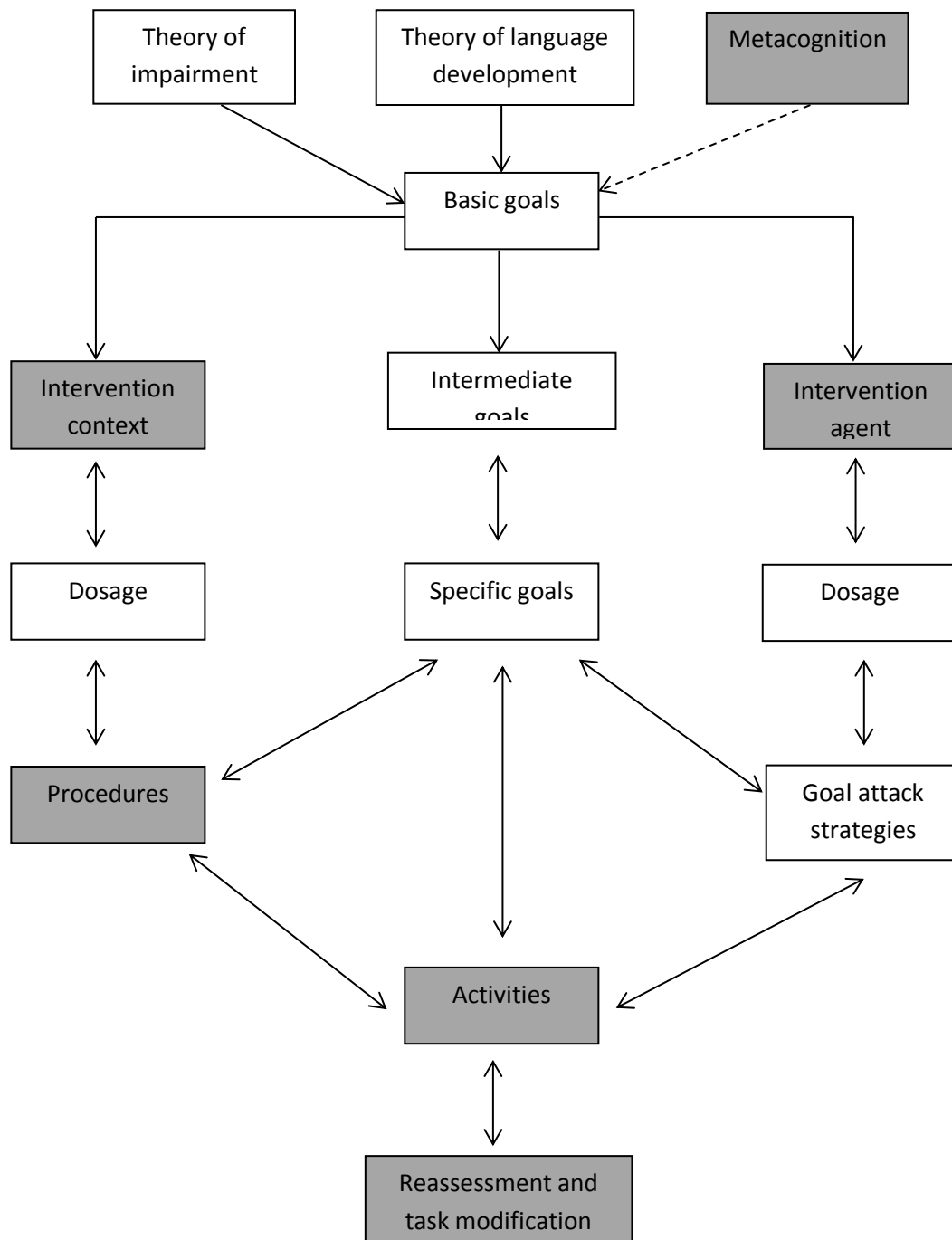
Fey's longstanding intention in modelling the components of therapy has been to identify the elements so that the relative effectiveness of each can be determined. This has supported the comparison of dosage in terms of frequency and intensity of sessions as well as varying the context, timing and frequency of therapist feedback (see Kamhi 2014 for examples). Comparisons of therapy agent have also been conducted and differences between effectiveness reported. To some extent, studies where parents and therapy assistants were trained specifically in how to respond to the children's attempts at the therapy tasks, treatment was effective (e.g. (Green et al., 2010); Adams et al. 2012a; Gardner, 2006). In studies where the nature of the training provided to the non-professional therapy agent was less specific or sustained, therapy was not effective (Gallagher & Chiat, 2009; McCartney, Boyle, Ellis, Bannatyne, & Turnbull, 2011). The addition of metacognition to a model of therapy suggests a means of designing intervention studies that can examine its effect in therapy directly. This discussion now turns to consider the clinical implications of metacognition as a component of therapy with influence on the therapy process.

5.2   Clinical implications

Several findings from this analysis of metacognition in therapy point to possible changes to clinical practice that may assist in the process of generalisation. Firstly, while task and strategy knowledge were largely implicit in SCIP, this analysis has shown how task and strategy names could be derived and the potential benefits of this are discussed. Secondly, a novel means of practising new skills in context has been revealed. How this may be applied to supporting parents and teachers of children with PLI to develop the reflective skills necessary to make changes in real world contexts is described. Thirdly, the explicit nature of metacognitive person knowledge in SCIP provided deeper insights into how children with PLI respond to comprehension failure. Descriptions of responses have been extracted from the data and presented as a means of assessing children's response to comprehension breakdown. Alongside this, therapy activities to assist at each level of breakdown are presented. Finally, through this analysis, the complexities of the therapy process in responding appropriately in order to keep the task within the child's ZPD has been highlighted. This has implications for determining who is suitably skilled to deliver

therapy and how more effective use of therapy partners can be developed as an essential component of therapy. These implications are discussed in turn.

A key finding from training studies in metacognition is that children who are taught names for strategies and know the WWW&H rule, generalise strategy-use to other similar tasks (Dignath & Büttner, 2008; Hattie, Biggs, & Purdie, 1996; Palincsar & Brown, 1984). Within SLT, the Junior Detective Training Program (JDTP) exemplifies the use of metaphors to describe strategies children need for successful social interaction (Beaumont & Sofronoff, 2008). In this therapy children play a computer game and 'help' the central character, 'the junior detective' to work out other characters' thoughts and feelings. The program uses symbols and metaphors for a range of actions the child needs to take to succeed: explore 'relaxation gadgets'; use 'thought missiles' to deal with unhelpful thoughts, and identify emotions from voice quality and intonation in a 'walkie talkie' game (Beaumont & Sofronoff 2008 p. 752).

With the exception of strategies for listening and comprehension monitoring, SCIP RSLT/ThAs rarely named strategies for language, conversation and social interaction skills explicitly. Analysis using the MCF revealed potential strategy names, but these cannot be said to be an explicit part of the SCIP intervention. Strategy names are different to the therapy targets in that they are designed to help the child remember what they are aiming to achieve rather than specify the linguistic or social goal of the task. For example, PRAG 1.1.1 therapy target is: *The child will understand the concept of listening to the interlocutor and will be familiar at a metapragmatic level with the features of good listening skills*; whereas the strategy name derived from the transcript of this activity is: *Think about the words*, a phrase many of the children used with the SLT/A to reflect on their own and others' behaviours. A more deliberate approach to teaching children names for strategies may therefore be helpful in developing self-monitoring skills which may in turn aid the transfer of skills from clinical to real world settings.

Visual representation of strategies is a common technique in SLT delivery e.g. (Archibold & Gathercole, 2006; Ebbels, 2007; Ganz, Kaylor, Bourgeois, & Hadden, 2008; Timler et al., 2007). In this analysis, SCIP RSLT/ThAs used symbols and drawings for strategies and children were assisted to create their own representations of strategies. Symbolic representation of strategies is considered to aid transfer of the skill to wider contexts (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; Paris, Cross, & Lipson, 1984; Paris & Jacobs, 1984). Engaging children in designing symbolic representations of strategies may be

a useful therapy activity that imparts not only strategy knowledge but may also motivate the child to adopt the strategy. Motivation is closely aligned with metacognition (Hacker et al., 1998) and although not studied here, this aspect of self-efficacy may be important to consider in future work.

The physical and social context of therapy is considered to be an important factor in achieving generalisation (McCauley & Fey, 2006; Paul & Norbury, 2012). A new means of integrating context into therapy has been identified through this analysis, where details of the child's recent actual communication and interaction breakdowns were used in sessions. Other intervention studies have reported how the child's real-time errors are used as part of therapy delivery (e.g. Gardner, 2004; 2006) but the author knows of no other intervention where real events are reported and then developed into therapy tasks. In essence this creates a context within which to discuss the reason for the breakdown, the implications of breakdown and the means of repair. It may be that the method developed in SCIP can be used to train parents and school staff in a procedure for reflecting on real-time communication breakdowns. Discussing the communication failure in a systematic way after the actual event with reduced emphasis on correction, and increased emphasis on engaging the child in collaborative problem-solving with the adult may be an important additional therapy component. Whitebread et al. (2009) refer to three levels of self-regulation: self, other and shared, where shared regulation is defined as learning in collaboration. Working collaboratively has the potential to reduce processing demands and may assist with using metacognitive strategies (Whitebread, 1999). If this is the case for children with PLI, a collaborative approach to problem-solving delivered by parents and staff may be a useful adjunct to direct therapy delivered by the SLT.

As an explicit component of SCIP therapy, multiple examples of metacognitive person knowledge were found in the data which revealed differences in how children with PLI respond to breakdowns in their comprehension. Six different responses to comprehension failure (i.e. monitoring) and the children's attempts to request clarification (i.e. control) were identified and are presented in Table 16 as a series of skills with corresponding therapy goals taken from the SCIP manual. Topic change and being non-responsive in response to comprehension breakdown are known as decompensation strategies (Perkins, 2007). It is important to identify whether these particular pragmatic errors arise in children with PLI as a result of non-comprehension, or whether they arise from pragmatic difficulties. Implications for therapy planning arise from a clearer understanding of these

responses in children with PLI. The actual data used to determine these different responses are in Appendix 4.

This checklist may be useful as an informal record of children's response to comprehension breakdown used alongside activities such as those proposed by Dollaghan & Kaston (1986), Skarakis-Doyle (2002) or Skarakis-Doyle & Dempsey (2008). By observing the child's pre-therapy skills in comprehension monitoring and specifying the therapy target more clearly, progress can be measured and outcomes more readily reported.

Table 16: Response to Comprehension Failure Checklist

Level	Description	Therapy goal
1	The child gives no response to questions and does **not** know that they don't know	Understand the concept of know don't know (LP 5.1.1)
2	The child changes topic or refuses to answer when they don't know	Understand the concept of know / don't know and link topic change, non-responsive behaviours to not understanding (LP 5.1.1 plus PRAG 4.3.1 (Understanding irrelevant topics)
3	The child uses guessing as a main, but ineffective, strategy	Understand the concepts of guessing and working out (LP 5.1.2)
4	The child knows they don't know but does not seek information to improve their understanding	Use strategies to repair comprehension: ask for repetition, more information, clarification (LP 5.2.1)
5	The child knows they don't know and knows that there at least one strategy to help but may rely solely on one strategy	Use multiple, personalised strategies including dictionary skills (LP 5.2.2, LP 5.3.2)
6	The child knows they don't know and uses the right strategy to help themselves	Use multiple, personalised strategies including dictionary skills in independent tasks in a range of contexts

SCIP therapy for comprehension monitoring was found to differ from the model proposed by Dollaghan (1987) in two ways: Section LP 5 included a specific focus on teaching vocabulary for different mental states; and the strategies, once established in basic activities, were integrated into all other SCIP activities where their usefulness was experienced and reinforced.

It may be that the SCIP model of training comprehension monitoring skills adds a level of metacognitive person knowledge not present in the Dollaghan model. This may be by

specifically training the child in understanding the mental state verbs needed to talk about their knowledge state, by engaging the child in monitoring other people's knowledge states, by creating a symbolic chart of the strategies which the child takes to class, or by embedding the strategies in all other therapy activities. As an essential but under-researched area of SLT practice, these data may provide the means for clinicians to observe baseline skills and provide intervention programmes that generalise to new contexts.

This analysis has shown how complex the therapy process is. Skilled and timely actions by the RSLT/ThA keep the task within the child's ZPD and provide support for them to learn the key metacognitive components of therapy, self-monitoring and controlled use of strategies. SLT delivery for school-aged children is largely done using a consultancy model in which the SLT provides training and advice to school staff (indirect therapy) together with a set of activities selected to develop the child's language skills (direct therapy) (Lindsay et al., 2002). The language-learning activities are most commonly delivered to the child by a member of the school staff, usually a teaching assistant (TA). This method lacks evidence of effectiveness (Gallagher & Chiat, 2009; McCartney et al., 2011). It may be that difficulties in delegating the therapy role effectively arise from a lack of clarity about the complexities of the therapy process and the ways that task delivery is modified in response to the child's performance to change the therapy goal from learning the skill to learning how to monitor and control one's use of the skill. The model proposed in Figure 5 may enable SLTs to separate out practice activities (Q1 and Q2) from monitoring activities, (Q3 and Q4) or to provide specific guidance, as Gardner (2006) did, on the specific responses required in each quadrant of the model. Recent cuts to NHS SLT services have increased the need to train parents and school staff as effective therapy partners. The explanation of therapy tasks as skill acquisition and self-monitoring with different therapy goals and therapist actions may enable SLTs to delegate their highly skilled roles with more confidence.

5.3 Methodological appraisal

The research aims for this study arose out of the experience of and findings from the SCIP RCT of the effectiveness of intervention for children with PLI. As a member of the SCIP team, further research into its delivery required specific actions on the author's behalf to guard against bias at all stages of design and analysis. The potential for bias and actions

taken are discussed here with regard to the research aims, sample selection, analysis and interpretation of the results. A reflexive account of the experience of analysis of self-generated data is also provided.

Metacognition was judged to be a worthwhile line of enquiry, both within the SCIP data and within SLT practice as a whole, for several reasons. Firstly, Law et al. (2008) highlighted metacognition as a potential implicit variable in SLT delivery which has evidence of successful generalisation of reading comprehension strategies (Palincsar & Brown 1984; Paris et al., 1984). Findings from Baxendale et al. (2013) raised awareness of the potential links between specific metacognitive intervention content and perceived generalisation of skills, which taken in light of review findings that generalisation of skills for children with SCDs is difficult to achieve (Williams White et al., 2006) provided the impetus to investigate SCIP delivery further.

Presuppositions and unacknowledged preferences or values can limit the trustworthiness of a study from the start (Norris, 1997) and so, to counter for tacit knowledge of SCIP intervention and metacognition in the researcher, two actions were taken. A reflexive account of pre-research knowledge and assumptions was written (see Sections 1.5.1 and 1.7) and a literature review was undertaken to find a suitable method that could offer some means of controlling for bias arising from tacit knowledge (see Section 2.3). The decision to conduct a mixed inductive and deductive thematic analysis was taken which enabled key theoretical concepts in metacognition to be identified and integrated into analysis at an early stage.

Even after identifying a suitable methodology several limitations are considered still present in the current study's method. The principal limitation is the potential for bias in this study arising from extensive knowledge of the SCIP intervention manual content and delivery before this study commenced. When the researcher has had extensive prior knowledge of the data, sample selection can be subject to researcher bias (Ritchie & Lewis 2003). After all ethical procedures had been followed, each family who consented to their video data being used for study was considered along a typology of features (age, impairment profile, intervention agent, period of sampling). The use of the typology was intended to gain as representative a sample of the SCIP cohort as possible, and in so doing to mitigate against bias in the selection of video data the content of which may have been used in supervision of ThAs and was therefore well known by the candidate.

Inclusion of deviant cases is intended to test the theory being developed and to limit bias arising from selecting only cases that will prove it (Silverman 2000). Comprehension monitoring, a metacognitive skill, is delayed in children with LI (Skarakis-Doyle & Dempsey 2008) and so three children in this sample (Cases 1, 2 and 5) could be considered to be suitable tests of the question of metacognition in SLT delivered to them. The youngest child in the SCIP cohort was selected as the critical case on the basis of the content of the intervention. A later session with the same child was included to determine whether the metacognitive content of SCIP could be observed to differ across the age range.

These steps are considered to have mitigated against bias in the selection of video data. After the data set was complete, a comparison with the entire SCIP intervention content showed that, although this data set contained a limited amount of therapy content, (30 activities) all of the six most frequently used components of intervention reported by Adams et al. (2012b) were present in the current study sample. The full list of the activities (and their goals) included in this analysis is in Appendix 5.

The prediction that the critical case would be a rich source of data was borne out and sufficient examples of metacognition were found to develop the MCF in its initial form. The MCF, with minor adjustments only, was able to capture the metacognitive content of the remainder of the data set. This process of using insider knowledge of research data to generate new knowledge can be seen to have been beneficial in this study.

Qualitative research practice is increasingly called upon to demonstrate rigour through more explicit explanation of stages and processes of analysis (Koch & Harrington, 1998; Malterud, 2001b; Rolfe, 2006). Every effort was taken in this study to make data analysis explicit and available for scrutiny. In the Methods chapter, stages in the development of the MCF were reported in full and mechanisms for making steps in analysis transparent were presented with examples. These actions increased familiarity with the data and helped eliminate error from coding and fine-tune interpretation of meaning through moving sections of data between the thematic charts and the original contexts. The steps in analysis (Table 8) were reported in the hope that they can be replicated or adjusted by other researchers in line with their research aims.

The analytical methods employed required selection of a small but representative sample of SCIP data. Small numbers of participants are common in qualitative studies and therefore qualitative findings are rarely described in terms of their generalizability

(Silverman 2000). It is important though to discuss the validity, or trust-worthiness, of these findings. Steps to enhance validity can take many forms and in this study, the process of thick description (Geertz, 1973) cited by (Cho & Trent, 2006) p. 328 was taken. This approach aims to provide richly detailed salient examples from the data which resonate with the analytic interpretation.

In constructing the MCF, data extracts from one case, the critical case, were replaced as more representative examples emerged from analysis of the remainder of the data set. Both the original and final versions of the MCF were reported, providing a rich description of the metacognitive content of the data. Comparison can also be made between versions to verify the illustrative nature of the extracts selected.

In the Results chapter, multiple data extracts were reported for each theme with details of the case, the activity and the session number in the SCIP intervention period, thus enabling others to examine the raw data and see how interpretations had been made. In developing the model of task design and delivery intended to explain the nature of metacognition in SCIP SLT (see Figure 5), examples of therapy corresponding to each quadrant in the model were identified in the Results chapter and referenced for the reader. Additional data transcripts and details of the therapy activities have been provided in the Appendices to support interpretations of these findings for clinical practice.

This analysis identified metacognition as the topic of analysis at the outset and achieved its aim of determining the nature of metacognition in the SLT interactions with children with PLI. However, it may be that a more inductive analysis might have revealed a different theoretical account of the interaction.

Discussion with supervisors on the content and development of the MCF was the main means of corroborating codes and data extracts deemed illustrative of the larger data set. This process was considered suitable to gain consistent implementation of the MCF and interpretation of findings, but it is acknowledged that multiple perspectives from people with different expertise and inter-rater reliability measures would have strengthened the validity of the MCF as a means of identifying metacognition in therapeutic interaction. Whitebread et al. (2009) provided detailed steps in the development and validation of a checklist of metacognitive behaviours in pre-school children which may provide a means of further developing the MCF into a research tool for examination of metacognition in other SLT data sets.

The data reported are from a small pool of SCIP intervention sessions and from one RSLT and three ThAs only. The data were generated from a manualised therapy, examples of which are rare in SLT, and therefore the extent to which the therapy content and delivery analysed in this study is representative of how other SLTs deliver therapy and manipulate therapy materials is not known.

Problems with generalizability of findings in qualitative research are well documented (Schofield, 2002) but this study did provide detailed documentation of the process of deciding on a suitable method and did also report the steps taken in adhering to the method. This detailed documentation yielded the Metacognitive Coding Framework that may be able to reveal the nature of metacognition in other types of therapy delivery.

To minimise bias in analysis and reporting, strict methodological conventions as outlined in Chapter 3 were followed. A reflexive account of the researcher's experience of analysis of data that had, at least in part, been self-generated reveals how tacit knowledge was controlled and how the process of analysis has contributed to the author's therapeutic practice.

5.4   Reflexivity throughout the research process

As well as documenting process, qualitative researchers need to develop and maintain reflexivity throughout analysis and reporting (Malterud, 2001b). A reflexive discussion on the researcher's experience of analysis, response to the main themes and the process of analysis of self-generated data is provided here.

The RSLT experience provided me with a raft of 'critical cases' in the sense of cases in one's clinical experience that stand out as meaningful (Roulstone, Wren, Bakopoulou, & Lindsay, 2012). Selecting a critical case in the methodological sense was made easier by having an independent SCIP caseload where I had delivered all the therapy which provided the background knowledge on which this decision was made. Knowledge of the manual content directed me to select a recording that included metapragmatic and comprehension monitoring activities.

My assumption that learning 'about' therapy takes place primarily by watching others deliver it has been acknowledged earlier. This assumption influenced the choice of

methodology for the current study in that I wanted to revisit the video data gathered in the RCT as a permanent record outside of my memory and interpretation of what was delivered. The use of video-recorded sessions is acknowledged in the literature as an effective means of teaching undergraduate SLTs (Horton, Byng, Bunning, & Pring, 2004). Using video data that preserved the actual content of the therapy provided what Schön (1983) referred to as an opportunity to reflect-in-action and employ disciplined subjectivity. The decision to extract a theoretical account of metacognition from the literature to guide the analysis was seen as an important means of limiting the influence of memory and researcher tacit knowledge of the subject. Bias in analysis arising from tacit knowledge was further limited by the use of a theoretically constructed observation schedule. The process of deducing appropriate terminology for clinical actions has been reported as an important part of the method in Chapter 3.

My understanding of the therapy process in SCIP has been enriched through examination of the main finding that metacognition was present in all aspects of SCIP therapy as a means of developing self-monitoring of skills. My questions about how generalisation was achieved for a group of children known to have particular aetiology that might impede generalisation, particularly generalisation of social interaction skills, were documented in section 1.5.1.2. Although, not providing a complete answer to how generalisation is achieved for this population, this study has provided a theory, metacognition, to guide further exploration and a means of observing where and how in the therapy process self-monitoring becomes the therapy target that was not known at the outset of this study.

I deliberated for some time over the model, (Figure 5), developed to represent the therapy process resulting from task design and delivery variables. Elements of the model became clear at different stages of reporting results and only after all results had been reported and reviewed did the relationships between findings begin to coalesce and synthesise into a deeper understanding of the complexities of the therapy process. This understanding of therapy process and how this process is enacted in delivery of therapy tasks is one that I have become able to articulate clearly as a result of this qualitative analysis. Figure 6, which positioned metacognition within an established model of therapy, enabled me to see the contribution of this research in a wider professional context and has been a valuable stage in developing researcher confidence.

Qualitative research is said to require "detachment from oneself, a willingness to look at the self, to accept and use criticism, and to be self-critical in a constructive manner" (Norris

1997 p. 173). The data set for analysis contained examples of my practice and, through analysis, my practice was exposed to evaluation and criticism. Being both researcher and practitioner with different degrees of experience and confidence in each role has required support from project supervisors to maintain a constructive approach to self-criticism. Findings from qualitative enquiry emerge with familiarity and time (Silverman, 2000) meaning that a questioning attitude and uncertainty is a feature of the analysis process. It may be that a degree of reluctance to express the uncertainty of possible interpretations of the data at early stages of analysis inhibited the synthesis of understanding that has been a feature of the latter stages of analysis and reporting. Fey (1986) considers all therapists to be research active as they create and test hypotheses regarding the presentation and management of each case they assess. A deeper understanding of the degree to which undergraduate or newly-qualified SLTs may be able to express uncertainty in clinical management has been an unexpected benefit to me from this work.

The process therefore of managing tacit knowledge and working with the literature to give dominance to theoretical knowledge has been a constant throughout this analysis. This may have elongated the process of analysis somewhat but has enabled me to present examples from within the data set for each theme with confidence. The rewards of this analysis are resonating in my clinical practice: for example, as clearer articulation of therapy goals to parents and staff; clearer explanation of success criteria and support needed to move the child from achieving the goal in sessions to real-world practice with support; and more confident delegation of practice activities to others. New knowledge of how metacognition is present in SLT clinical decision-making and in how self-monitoring may be acquired through the therapy process has been reported here. The resulting ideas for future research now discussed are presented in the hope that further exploration of the nature of metacognition will enhance SLT practice for populations other than the one studied.

5.5 Future research

The role of metacognition in SLT for children with PLI has not been systematically studied before and its effect on intervention can only be tested once its presence can be identified and described. This study has developed the MCF which has been shown to have captured the metacognitive content of therapy activities for language processing (LP), pragmatics

(PRAG) and social understanding and social interaction (SUSI). As such, the MCF may be able to determine the metacognitive content of other SLT interventions and clarify the therapy processes at work in them. Whitebread et al.'s (2009) exemplified process of externalising the tacit knowledge of teachers through guided reflection and taking measures of inter-rater reliability may provide a means of further developing the MCF into a research tool for examination of metacognition in other SLT data sets. Recently, Bryce & Whitebread (2012) developed a metacognitive coding framework for school-aged children following a similar process but with greater emphasis in the framework on theory relating to monitoring and control processes (Bryce & Whitebread, 2012). There is documented potential therefore to take the MCF as the starting point in a process to understand metacognition in SLT and to refine the theoretical focus and target population as evidence accumulates.

Figure 6 has positioned metacognition in an established model of therapy components developed primarily to guide research in clarifying the nature of each component and examining the relative contribution of each element (McCauley & Fey 2006). Law et al.'s (2008) concern that metacognition, as an implicit and potentially important but little understood element of SLT practice, can now be addressed, and its effect, if any, on therapy effectiveness can be examined. Research to examine the effect of metacognition on therapy effectiveness would require a very well-controlled research design. Tacit knowledge or an unacknowledged adherence to a metacognitive learning theory by the therapy agents in any such study would introduce bias to the results. A comparison of two established therapy approaches for children with phonological disorders (Hesketh, Adams, Nightingale, & Hall, 2000), one of which is rich in metacognitive content, showed no significant differences between groups after therapy. An assessment of the children's pre-therapy metacognitive abilities may have helped clarify whether children in the articulation therapy group had better metacognitive skills at baseline that they were able to use to make the articulation therapy meaningful to them across contexts. The assessment of children's metacognitive abilities in the typically developing population is open to criticism (Schraw, 2009) and a means of assessing this skill in children with LI will require the design and trialling of new methodologies and tasks to establish their validity and reliability.

Conversational analysis of sections of the data in this study may provide specific insights into clinical practice in two areas. Firstly, task and strategy names which were previously under-specified by the RSLT/ThAs were identified in analysis using the MCF. By identifying

specific strategies by name, their presence in the remainder of the data could be observed. Adams et al. (2012b) reported that strategies taught in one aspect of the SCIP manual were integrated with strategies in other aspects to replicate the emergent nature of pragmatic skills in the typically developing population (Adams, 2005; Perkins, 2007). These data have provided some examples of this integration e.g. a language strategy being prompted by the RSLT/ThA in order to support the child to access a SUSI activity. The potential now exists, therefore, to select sections of the data coded as MCF Category 3: Talking about strategies and to examine interaction in these sections more closely to identify strategies used within specific SCIP activities. In this way, insights into task complexity and how strategies from one section of the SCIP manual were used in other sections could be gained.

A similar analysis of sections coded as MCF Category 4: Talking about monitoring could be undertaken to examine not only the mix of strategies required to engage in the activities enacted in Q4 of Figure 5, where self-monitoring is the goal, but also to determine, if, as Whitebread et al. (2009) state, that there is a process of moving between states of other-, shared- and self-monitoring which results in passing the responsibility for monitoring from the teacher to the student. Greater clarity around how children with PLI can be supported to move from other- to self-regulated control of their social interaction skills would be of benefit in designing effective interventions for these children who currently experience long term limitations on social and academic participation.

5.6   Conclusions

This qualitative study aimed to understand the nature of metacognition in a manualised SLT intervention delivered within a RCT, the Social Communication Intervention Project (SCIP) (Adams et al. 2012a). Analysis of a small sample of video recordings of SCIP intervention sessions revealed metacognition to be present in the content and delivery of therapy activities in implicit and explicit ways. The presence of metacognitive skills of monitoring and control in activities from all three aspects of the SCIP manual (LP, PRAG and SUSI) could not have been predicted from descriptions of how to implement SCIP intervention provided in the literature. Further, how therapy tasks are adjusted in delivery by the RSLT/ThAs to change the metacognitive demands of the task has been made clear by this analysis. Therapy tasks within each section of the SCIP manual were adjusted by the RSLT/ThAs to provide a context within which children with PLI were taught to understand

language, pragmatic and social interaction skills *and* to monitor these thoughts, feelings, actions and interactions in themselves and other people. The explicit nature of metacognitive person knowledge may have been predicted from knowledge that the SCIP intervention manual included a section on comprehension monitoring (LP 5), but this analysis has revealed how LP 5 differed in content and delivery from traditional SLT intervention for comprehension monitoring.

This review of practice may be considered to be an attempt to report on the internal evidence base in SLT. The role of the researcher in first creating and then analysing the therapy data in a theoretically guided thematic analysis has provided a unique perspective on a manualised intervention with proven effectiveness. The nature of impairment in children with PLI is well documented in the literature as arising from deficits in language processing, social cognition and pragmatics. Working from a developmental perspective Adams (2005) used the literature on typical development in these areas to construct the SCIP intervention manual content which was tested in a RCT (Adams et al. 2012a). The current study, which examined the implementation of SCIP therapy from a theoretical perspective, can perhaps be argued to be the third step in a process that has developed an effective manualised intervention and has provided sufficient detail for its implementation by practitioners by clarifying the therapy process and potential mechanism of change.

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Appendices

Appendix 1: Social Communication Behaviour Checklist (as used in the SCIP Trial)

Social Communication Behaviour Checklist (SCBC): used for screening/recruitment purposes only

(Adams et al., 2012a)

Is the social communication behaviour present in opinion of referring practitioner?	Yes/No
1. The child has trouble understanding and interpreting the social context and friendship, e.g. social roles, emotions	
2. The child has trouble understanding and /or using nonverbal aspects of communication e.g. facial expression, intonation	
3. The child has trouble with aspects of conversation e.g. beginning and ending, taking turns, giving relevant and sufficient information	
4. The child makes bizarre, tangential or inappropriate comments	
5. The child has difficulty using and understanding non-literal language	

Appendix 2: Examples of therapy activities in the SCIP manual

Child ID:
Date + Session number

LP 5.1 Signalling non-comprehension
Activity 1: What's in the Box?

Description of Target: The child will learn the difference between knowing and not knowing, guessing and working it out
Purpose: To enable the child to understand the concepts of <u>knowing</u> and <u>working out</u> and to practise ways to work things out or signal that they do not know. The child will learn that everyone needs to work things out and signal non-comprehension.
Materials • Opaque box or tin • Variety of familiar objects to be hidden inside • Symbols for 'I know' and 'I don't know'
Procedure – Group activity • Hidden from the children's view but with their knowledge, hide an object in the box • Ask 'Who <u>knows</u> what's in the box? • State 'I <u>know</u>' and explain how you know – i.e. I put it there • Give everyone an 'I don't know' symbol and yourself an 'I know' symbol and explain why. • Ask children to take turns to work out what's in the box, but they mustn't tell the rest of the group • Discuss ways of working out what's in the box – take a look / ask a friend / have a clue (semantic) to 'work it out' • Each child has a turn to work it out and when they know swap their card and explain explicitly what is happening – 'Jack knows because he had a look' • Encourage and repeat at end of every turn who knows and who still needs to work it out, swapping cards as children know. • Lots of praise for saying 'I don't know' e.g. That's the <u>right </u>answer, you don't know. Would you like to <u>work it out</u>? • Continue around the group until everyone has an 'I know' symbol and describe all the ways used to work it out. • Repeat and model once more before supporting one child at a time to be the one who hides the object and gives out the symbols. • Discourage guessing but if any child persists in guessing see LP 5.1 Activity 2
Success Criteria The child will be able to say 'I don't know' and will ask for more information to work things out appropriately
Input Guidance This activity depends hugely on positive encouragement to say 'I don't know' and on learning that it is possible to work things out in a variety of ways

Ways to make the activity easier:	Ways to increase complexity:
Tell each child how they can work it out Give simple clues to work it out	Ask children to think of own strategies. Give complex clues to work it out

Child ID:
Date + Session number

LP 2.1 Sequential organisation of simple stories
Activity 2: Simple Sequencing

Description of Target: The child will be able to identify and produce simple 3 step stories including a main idea, detail, sequence, inference and prediction	
Purpose: To enable the child to organise ideas into simple sequences and narrate events	
Materials • WP sequence cards • Black Sheep Press 3 and 4 step sequences • Traditional Stories sequence sets • Blank card • Question mark card	
Procedure • Model one sequence of a familiar event • Describe the sequence using simple sentences for each picture, including in your description the *main idea, detail, the event sequence*. • Discuss and explain explicitly what will probably happen next [prediction] • Discuss explicitly any reasons you have for the prediction or for the event sequence described [inference] • Repeat with new sequence and ask the child to describe and answer questions • Reverse roles allowing the child to set out the sequence and describe independently	
Success Criteria The child will be able to tell simple stories of 3 steps using pictures	
Input Guidance Observe the child's responses and if they are unsuccessful or are finding the task too easy react in one of the following ways:	
Ways to make the activity easier:	Ways to increase complexity:
Give only 2 pictures Ask child to identify first picture Cue to find next and last pictures Lay out all three in order but one face down for child to work out contents	Add question mark card in sequence to add more detail Ask child to draw additional event on blank card to add detail

PRAG 1.1 Improving listening skills
Activity 2: Listening for content

Description of Target: The child will understand the concept of listening to the interlocutor and will be familiar at a meta-pragmatic level with the features of good listening skills
Purpose: To heighten awareness of listening for content of spoken language
Materials • Puppet with large ears or large stick on ears – made out of paper and stick on with tape temporarily • Stories or narratives with repeated key word • Stories with repeated key sounds • Cards with key word or sound written down • Stamp and stamp pad + paper for stamping or columns drawn in home book.
Procedure • Stick the ears on the puppet or draw attention to his big ears. Say "*why do you think we're doing this?".* Have a little discussion and conclude "*we're doing this because we're going to teach the puppet how to listen very carefully".* • Now settle the puppet down to listen and say, "W*e're going to play a listening game. I'm going to read out a story with a magic word and when you hear it (said to puppet and child) you have to hold up the magic word card"* (point to card with magic word written down on it). • Read the story aloud and make sure the child and the puppet get some each. Each time they hear a magic word they get a stamp. Count them up at the end of the story and see who has won. • Repeat with story with words that begin with a specific sound.
Success Criteria The child will demonstrate awareness of the importance of listening for content
Input Guidance Observe the child's responses and if they are unsuccessful or are finding the task too easy react in one of the following ways:

Ways to make the activity easier:	Ways to increase complexity:
Shorten the story Do one sentence at a time Slow down Emphasise the word/sound clearly Remove the puppet and just have the child listen	Read more quickly Introduce distractions or pauses Introduce more than one magic word/sound Move on to next activity Combine sabotage and good listening for content

Child ID:
Date + Session number

SUSI 3.1 Describing routines and changes in routines

Description of Target: The child will be able understand and identify changes in social routines and to associate emotional language with changes
Purpose: To enable the child to accept changes in routines
Materials • Social scene cards to represent simple and familiar situation [Schubi Combimage numbers 78, 150, 107, 50, 111] one scene on one sheet of A4 • Emotions thermometer • List of usual routines from home / school
Procedure • Discuss one scene as detailed in the usual routine script • Emphasise and explain that sometimes things happen to people that they didn't expect and might not like and that might make them a bit upset • Discuss thoughts, feelings and words for the characters – draw these out on the A4 sheet using speech and thought bubbles and adding feelings in a colour to match the thermometer • Work toward solutions and acceptance making explicit reference to upset and solutions thoughts feelings and words for each person if appropriate • Model set phrases e.g. *'Never mind', 'OK I'll have vanilla"* etc. • Work towards keeping calm – discuss strategies and refer to emotion changes on thermometer showing calm and happy at the bottom of the scale
Success Criteria The child will be able to describe potential changes to routines and accept them as minor upsets.
Input Guidance Observe the child's responses and if they are unsuccessful or are finding the task too easy react in one of the following ways:

Ways to make the activity easier:	Ways to increase complexity:
Use LP 2 Narrative activities to promote flexibility in non-personal stories	

SUSI 4.2 Predicting likely thoughts and intentions of others
Activity 1: What's he saying, what's he thinking?

Description of Target: The child will be able to identify and describe expected future events, emotion and thoughts for a variety of characters
Purpose: To develop the child's understanding of people's likely thoughts and emotions for complex social situations   To gather personally relevant stories for use in later intervention
Materials   • Pictures of social contexts from WP social scenes as below   • Personal stereo on train/ luggage on seat on bus/child inside others out/untidy bathroom/opening door for woman with pram/bowl of water for dog/dinner guests with wine   • Speech bubble post-it notes   • Plain white cards   • Emotions thermometer
Procedure: • Lay out one scene and describe it explaining the likely thoughts and emotions for one character in the scene   • Make explicit links to facial expressions and behaviours and refer to the child's emotions thermometer   • Add detail to what he might do next on the white card   • Create speech bubble –ask '*What's he saying?'* record this in speech bubble   • Create thought bubble –ask '*What's he thinking?'* record this in thought bubble   • NB draw attention to the fact that thoughts and words match   • Repeat with all pictures, reinforcing good responses and developing weak ones and discuss reasoning explicitly
Success Criteria The child will be able to describe expected events, emotions, thoughts and words for complex social context pictures
Input Guidance   Observe the child's responses and if they are unsuccessful or are finding the task too easy react in one of the following ways:

Ways to make the activity easier:	Ways to increase complexity:
Add examples for thoughts and words	Introduce alternative predictions and feelings etc. and discuss reasoning explicitly Use Gruffalo Book – hidden intention on every page

Appendix 3 The Initial Metacognitive Coding Framework (1: Talking about tasks)

1 Talking about tasks		
Code and sub-code with reference numbers		Example to illustrate
1.1 naming tasks	1.1.1 using specific names for tasks	And what you and I are going to do today. We're going to think about good listening
	1.1.2 non-specific names for tasks	We're going to do lots of nice things today. Shall I tell you what we are going to do?
	1.1.3 CHILD names a task	Child: Good listening
1.2 talking about task materials		Child: Why have you got that book there for? We're going to look at that book in a minute. Do you know a story called 'Room on the Broom'? Child: Yeah. Do you like it? Child: Yeah, it's fun.
1.3 explaining how to do tasks	1.3.1 instructions that use the strategy name	Ok, so, this is what we are going to practice. I'm going to read a story [shows child small picture of a hat] and I want you to think about the word 'hat' Thinking about the work. OK. Every time you hear the word 'hat', I want you to put your hand up [models hand in air, child copies] I'm going to give you a big pointy arrow and you are going to stick it on the clue.
1.4 Repeat the task to practise the strategy		So, you were thinking about the work [points at icon on chart]. Let's try one more. This time do you think you can listen for the word 'cat'? Shall we, just very quickly, look at some other stories that you could tell. Put it back down and listen for the next time.

1.5 role reversal		Do you want to try to help Sheep be a really good listener?
		Child: [gathering pictures from the desk as SLT selects them from file] It's your go now.
		Let's do one more story and this time I would like you to tell me the story.
1.6 talking about task demands		Child: Too much pictures.
		Child: It's too much, I can't do that.
1.7 explain vocabulary to complete the task[4]		Child: Or take a chill pill
		Take a chill pill
		Child: Yeah, what is a chill pill?
		That's something that people say and it means, 'just relax'. People say, take a chill pill and it means, it doesn't actually mean, take something, it means just relax. Do people say that to you sometimes?
		Child: Sometimes, my mum says, take a chill pill, I will say OK. And I relax
		That's all it means. It means, relax.
		Child: What are hobbies?
		Hobbies are things you like to do
		Child: Football?
		Yeah, football, dancing,
		A hobby is not just something that you like, it's something that you do as well.

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[4] This code was added from analysis of case 2

Appendix 3 The Initial Metacognitive Coding Framework (contd.) (2: Talking about prior knowledge)

2 Talking about prior knowledge		
Code and sub-code with reference numbers		**Example to illustrate**
2.1 find out what the child knows by asking	2.1.1 about the current task	Do you know about listening? What do you have to do when you are a good listener?
	2.1.2 about the strategy being practised	What do we look at when we are listening? Tell him what he needs to do to be a good listener.
2.2 CHILD states what they know	2.2.1 prior knowledge is present	Child: Listening, you got to look at the teacher
	2.2.2 prior knowledge is absent	What do we do with our hands? Child: [holds hands out straight] Child: Bend our hands like that [pointing to the picture] No response
2.3 feedback to the child on what they stated / know	2.3.1 using the task or strategy name	That's right. So, what, you just said, 'Good looking'.
	2.3.2 feedback that describes what the task or strategy is not	We don't put them under the desk [models and taps fingers] Child: Look at that [referring to his hand shapes] We don't put them in our pockets [models] We don't put them in our bags [reaches for bag]
	2.3.3 that uses a visual representation of the strategy	No, that's right you don't know, so you hold onto that card [gives symbol for 'I don't know']. Wait a second. You don't know. That says 'I don't know'.
2.4 explain the link between prior knowledge and the task		You said, you've got to look at the teacher, good thinking. So when we are together and when you are listening, you will be looking at me won't you? And when I am listening, I will be looking at you.

Appendix 3 The Initial Metacognitive Coding Framework (contd.) (3: Talking about strategies)

3 Talking about strategies		
Code and sub-code with reference numbers		Example to illustrate
3.1 naming strategies	3.1.1 SLT names the strategy	Or looking at the teacher. So, one of the other things that we do, we might look at the teacher who is here [drawing]. Or we might look at the work. Isn't that right?
	3.1.2 CHILD names the strategy	What was he doing? He wasn't keeping his…. Child: Hands He wasn't keeping his hands still. What's he thinking about? Child: He's thinking about the pages. Brilliant, he's thinking about the pages. Child: yeah, look at the work. How about listening to the teacher [turns himself to face SLT and looks at her]
3.2 Describing a strategy by what it is not		He wasn't keeping his hands still. [puts Sheep's hands back in box] He was fidgeting. That's called fidgeting, isn't it? You were thinking about toys in your pocket. You were thinking about something else
3.3 SLT explains steps in strategies		This arrow is going to point to the clue. Child: Are we allowed to keep it? Is it for me? Stick it on my hand No, we're going to stick it on our picture. So I want you to look on here and.. Listen. There is a clue on our picture that tells us how old the boy is. What is the clue? Is he wearing a badge on his jumper?
3.4 visual representations of strategies		Therapist drawing: So here we've got a boy and he's sitting still and so he is listening. So that is another job that we have to do.

3.5 SLT asks the child to use the strategy		Show me 'keeping your hands still'. So I need you to think about the work Can I give you some of these pictures to put in the right order? Now one of the very important jobs about listening, is listening to the words. Child: Yeah
3.6 Using a strategy correctly	3.6.1 SLT using the strategy correctly	No, what do we do? We keep our hands nice and …. Still Child: Still Keep them on the desk [models keeping hands on the desk]. Give me a clue. What do we do with it? Child: It's light it up and you see something You light it up and you can see something. That's a good clue. Is it a lamp?
	3.6.2 CHILD using the strategy correctly	Show me 'keeping your hands still'. Child: [hands flat on desk and still] Ok, Sheep, are you ready next time? Child: Yeah, I am holding onto the face. That's a good idea, help him to listen, he needs to look at the work. When you hear the word hat, put your hand up [models]. Child: Yeah *Down cried the witch and they flew to the ground, they searched for the **hat**,* [pause] Child: [hand up]

3.7 Using a strategy incorrectly	3.7.1 SLT using the strategy incorrectly	We don't put them under the desk [models and taps fingers] Child: Look at that [referring to his hand shapes] We don't put them in our pockets [models] We don't put them in our bags [reaches for bag] I think I could either have a look, or I could ask for a clue to work it out. Maybe I could have some guesses. Child: I'm not going to tell you. You're not going to tell me? Can I have 5 guesses? Child: Yeah Is it a telephone? Child: No Is it a watch? Child: No! Is it a pencil? Child: No!
	3.7.2 CHILD using the strategy incorrectly	Child: [makes puppet fidget and moves puppet to the box] Child: I got four toys in my pocket Were you thinking about the work? [points to icon on chart] You were thinking about something else. *blew off her **hat*** Child: Blew off her hat SLT [points to the picture] whispers 'put your hand up'. Did you hear the word 'hat'? Child: [nods] So that's what you are listening for.

3.8 SLT gives praise / feedback / extrinsic rewards to the child for using strategies	3.8.1 using the strategy name	So look, you're keeping your hand still now. [touches child's left hand, still on the desk]. Very good thinking about the work. So these things are all very important. Ok? So here we've got looking at me, which you did really well. So a big smile for looking at the teacher [draws smile]. Sitting still, big smile for sitting still [draws smile]. Very good work on keeping your hands still [draws smile].
	3.8.2 using a visual representation	So let's practise, let's have a look [at chart]. You're going to look at me, sitting still, keep your hands still, nice work. I'm going to give you smiley faces for all of those. Brilliant work. Lots of smiles.
3.9 SLT links the strategy to the task		He needs to look at the pictures and that means, that shows that he is listening So the clue is how many candles. The question is, 'how old is the boy?' and the clue is the number of candles. That's the clue, that's how we work it out. And then we did 'what do people say?' That's a speech bubble. Remember when the mummy was going to the swimming pool. What are people saying?
3.10 SLT asks/tells why the strategy is important		You were thinking about something else. Child: [nods and smiles] You were thinking about toys in your pocket. So you missed the [shows picture of hat to child] Child: Hat Are you guessing? Shall we have a go at guessing? Let's see how good it is to guess. I'm going to give you 5 guesses because you might be lucky. 1,2,3,4,5. Or, we can think about asking for a clue and I will give you 5 clues and see which one is easy. Is it easy to have guesses or easier to have a clue. So have some guesses, what do you think it might be?

3.10 SLT asks/tells why the strategy is important (contd.)		I did feel happy. [draws happy against list for clues] Is it a good idea to guess and get all of those wrong answers and sad faces, or is it a good idea to ask for a Child: Clue It's a good idea to ask for a clue. I think so. Cos look, I did 1,2,3,4,5 guesses all wrong [gesture all wrong] and you gave me 1 clue and how did I feel? Child: Happy Because I know. I think it's a good idea to ask for help when we're a bit stuck. So you see how important it is when you are listening, you've got to think about the work. So that was a good story. It's always good to think about about what people are saying, and thinking.
3.11 SLT asks child to use strategies in new task (using multiple strategies)		So all the way through telling stories, we're going to be looking at the pictures [pointing at each icon on chart], sitting still, keeping our hands still. Let me tell you a story about going swimming and you are going to keep your hands still. Ok? Ah, very good story telling. How old is that boy? Child: I don't know Are there any clues in the pictures that could help us find out?
3.12 SLT links strategies to wider experience		So even if we are sitting on the carpet, sometimes do you sit on the carpet? Child: Yeah And can you sit without wriggling? Child: Yeah [stops wriggling and turns to SLT] Very good, so sitting still. So even if you are on the carpet.

Appendix 3 The Initial Metacognitive Coding Framework (contd.) (4: Talking about monitoring)

4 Talking about monitoring		
Code and sub-code with reference numbers		Example to illustrate
4.1 self-monitoring strategies	4.1.1 SLT asks child to monitor his own use of the strategy	Were you thinking about playtime? Child: [shakes head] You were thinking about the…. Child: Work Do you know what I am looking at? I am just looking at our chart and wondering about your hands [pointing to keep hands still] Child: [sits back and folds his arms] Aw, good thinking. Big smile for thinking about it. Well done So, here it is supper time. Can I give you some of these pictures to put in the right order? Child: Yeah, nods. Which one is the beginning?
	4.1.2 CHILD comments on his own use of strategies	Ok, what about these three? Try to sort those out and get those in the right order for me Child: [sorting 3 pictures for the end of the story] No… I think that one What were you thinking about? Child: I was thinking about listening. Child: [drops pencil off edge of desk and gets up to get it] Ok, thank you for getting that. Can you manage? Thank you. So what happened there? Were you keeping your hands still? Child: No

4.1 self-monitoring strategies (contd.)	4.1.3 SLT asks child to monitor their own comprehension	Do I know what's in the box? Child: No No I don't know. Do you know? Child: Yeah Yes, you do. What do we think about when we are listening? Child: I don't know
	4.1.4 child monitors his own comprehension	Can you draw someone's hand for me? Just here. This is our picture that we're making. Child: I'm going to copy yours? Ah, very good story telling. How old is that boy? Child: I don't know
	4.1.5 child monitors his own feelings[5]	They (balloons) might pop Child: yeah and I'm scared Is that why you don't like them? Child: Yeah
	4.1.6 SLT asks CHILD to monitor the link between feelings and events[6]	It's really normal to be a little bit scared of balloons, cos when they go bang, that's really loud isn't it? Child: Yeah But do you think it's a reason not to go to a party if there might be balloons? Or do you think you should still go? Child: I think I could still go I think so, cos even if they go bang, it's only for a minute isn't it, that it's scary. And everybody feels a bit scared when they go bang.

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[5] This code was added from analysis of case 2
[6] This code was added from analysis of case 2

	4.1.7 CHILD explains the links between feelings and events[7]	Child: On a doorway near the door there was pop and it was close to my mouth and I nearly cried. I didn't You didn't cry. Do you think everybody was feeling a bit shocked? Child: Yeah, but, wow what was that?
4.2 monitoring others	4.2.1 SLT asks CHILD to monitor someone else using a strategy	Let's see if Sheep is listening, you're watching Sheep as well and see what he does. See if he is listening. Listen, I want to ask you something else. What was Sheep looking at? Child: Looking at me. Was he looking at the pictures? Child: No [shakes head] Was he looking at the work? Child: No Was he looking at me, the teacher? Child: No He was looking at you and he was looking at the wall.
	4.2.2 CHILD comments on someone else's comprehension	Child: What is Sheep thinking now? Child: Do you know now? Child: You're not a good, you're not a good guesser are you? Not really Child: What are you looking at Sheep?
	4.2.3 SLT asks child to monitor someone else's comprehension	Do I know what's in the box? Child: No I do [smiles nods]

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[7] This code was added from analysis of case 2

	4.2.4 SLT asks child to monitor someone else's feelings	Is it some music? No! Oh! How do I feel at the end? Child: Sad! Did I work it out? [uses I know card as prompt] Child: Yeah I did, so how do you think I felt? Child: Happy I did feel happy.
4.3 SLT gives feedback on monitoring		Do you know what's in my box or do you not know? Child: I not know You don't know, that's right.

Appendix 4: Data showing how children with PLI respond to comprehension breakdown

The data extracts presented here represent the different ways that children were found to respond to comprehension breakdown collated in the Response to Comprehension Failure Checklist in Table 16.

1: The child did not signal non-comprehension or ask for information. The ThA provided the answer to her own question.

> *Do you know what she might be thinking? 'Cos it's not always easy to tell from what someone says what they might be thinking.*
>
> *Child: No response*
>
> *But what she's thinking is "I forgot my purse. I need to borrow some money."*

> (Case 3 session 14 SUSI 4.2.1)

2: The child ignored the speaker and started talking about a new topic. The RSLT explained what had happened and provided the child with the name of the strategy he needed.

> *Can you think of four other jobs?*
>
> *Child: My mouth's wet.*
>
> *Are you thinking about the work or something else?*
>
> *Child: My lips.*
>
> *You're thinking about your lips. That's not thinking about the work, is it?*
>
> *Ah, thinking about… what should we think about?*
>
> *Child: Work.*
>
> *The work. Ok, so you sit up for me properly.*

> (Case 4 session 16 LP 4.4.2)

3: The child attempted to answer, but did not signal non-comprehension or ask for information. The ThA gave specific feedback on two strategies that the child could use to help themselves: listen to the question and ask if you don't know. Visual representations on the child's listening chart were used to remind the child of the strategies.

> *And if I say, oh that looks like fun. What do I want?*

Child: You want to open the window as well.

No, have a listen to the question [points to symbol chart]. If you don't know, you need to ask.

<div align="right">(Case 2 session 11 PRAG 5.3.1)</div>

4: The child signalled non-comprehension but did not ask for information to work out the answer. The RSLT told the child what to do to work out the answer.

Do you ever feel frustrated? Do you know what it means?

Child: I don't know.

What's it close to on your thermometer?

Child: It's close…

It's close to….

Child: Angry

It's close to angry isn't it?

<div align="right">(Case 1 session 8 SUSI 1.4.1)</div>

5: The child stated that he didn't know and explained that he had tried to work it out. He did not ask for additional information to work it out. The ThA explained what strategy to use when you can't work things out.

You don't know, very good. [points to icon on symbol chart]

Child: I know, 'cos I can't work it out

Ok, that's fine, so what you need to do is ask for help, ok?

<div align="right">(Case 2 session 11 PRAG 5.3.1)</div>

6: The child signalled that he did not know by asking for repetition. The RSLT gave specific praise by naming the strategy he had used and another that would aid him to succeed: asking for repetition and thinking about the words.

Child: Orange, orange, gold… which one is it again?

Well done, good asking. Shall I tell you? … Just think about the words.

<div align="right">(Case 1 session 8 LP 4.1.1)</div>

Appendix 5: The full list of SCIP activities and goals in the study sample

Activity number	Therapy goal
PRAG 1.1.1	Understand the concept of listening and be familiar at a metapragmatic level with the features of good listening skills
PRAG 1.1.2	Heighten awareness of listening for content of spoken language
PRAG 1.4.4	Understand the sequences of listener and speaker talk in conversations
PRAG 1.5.3	Identify problems in conversations and learn repair strategies
PRAG 5.1.4	Understand different styles of verbal interaction in social contexts
PRAG 5.3.1	Develop awareness of indirect speech acts as a form of politeness
LP 1.1.6	Identify relationships between words and link new words to existing vocabulary
LP 1.2.1	Establish basic phonological awareness of onset and rime
LP 1.5.2	Understand and use new vocabulary in short sentences
LP 2.1.2	Identify and produce simple 3 step stories including a main idea, sequence, inference and prediction
LP 2.2.1	Organise a series of up to 8 pictures into a coherent sequence of events
LP 2.3.1	Re-tell events listing key aspects of the story from the following elements: introduction, characters, events, problem, resolution and conclusion
LP 3.1.2	Understand multiple meanings for selected words
LP 4.1.1	Build up listening and memory for verbal information in a stepwise fashion allowing the child to succeed in listening and understanding
LP 4.2.1	Make predictions based on knowledge inferred from pictures
LP 4.2.2	Establish the meaning of why questions and develop appropriate answers
LP 4.2.3	Make appropriate inferences from simple verbal information with no visual context provided
LP 4.2.4	Encourage the child to make inferential links from complex contexts
LP 5.1.1	Learn the difference between knowing, not knowing, guessing and working out
LP 5.1.2	Use available information to work things out and desist from guessing
SUSI 1.1.1	Describe actions and interactions in social sequence pictures requiring little or no inference
SUSI 1.3.1	Identify, describe and suggest solutions for a range of problems in social settings
SUSI 1.4.1	Identify, describe and suggest solutions for a personally relevant problem that has arisen for them in a social setting
SUSI 2.2.1	Identify expected emotions for simple social contexts
SUSI 2.5.1	Identify and describe emotions for relevant and personal social contexts
SUSI 2.5.2	Suggest and use strategies to deal with own complex emotions in social contexts
SUSI 3.1.1	Understand and identify changes in social routines and to associate emotions with changes
SUSI 3.1.2	Understand and identify personal routines and associate emotions with minor changes
SUSI 4.2.1	Identify and describe expected future events, emotion and thoughts for a variety of characters for complex social situations
SUSI 5.1.1	Understand the importance of shared interests in building friendships